



INSTITUTE  
OF THE MOTOR  
INDUSTRY

IMI QUALIFICATION



# QUALIFICATION SPECIFICATION

## Part B:

## Assessment Criteria

## For

## IMI Level 1 Certificate in Transport Maintenance

### QUALIFICATION NO.:

601/8754/2 (G)

*To be used in conjunction with learner guidance and  
candidate assessment summary*

*For assessor only: Assessor and Verifier Guidance*

## CENTRE INFORMATION

Please be aware that any **legislation** referred to in this qualification may be subject to amendment/s during the life of this qualification. Therefore IMI Approved Centres must ensure they are aware of and comply with any amendments, e.g. to health and safety legislation and employment practices.

Please be aware that **vehicle technologies** referred to in this qualification reflect current practice, but may be subject to amendment/s, updates and replacements during the life of this qualification. Therefore IMI Approved Centres must ensure they are aware of the latest developments and emerging technologies to ensure the currency of this qualification.

Please note: the relevance of the information contained in the **unit content** will vary depending upon the vehicle types being worked upon. The unit content is for guidance only and is not meant to be prescriptive.

For Office Use Only		
Version and date	Change detail	Section/page
V7 29/09/17	Unit title for L1MV41 on page was incorrect	Page 4 contents page
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## **IMI Level 1 Certificate in Transport Maintenance -Generic**

In order to achieve this qualification, learners must achieve the following:

### **Generic Pathway:**

**Group A:** All units (TQT: 63 Hours)

**Group B:** Min 1 units to be selected (TQT: 12-28 Hours)

**Group C:** Min 2 units to be selected (TQT: 20-37 Hours)

**Group D:** Min 2 units to be selected (TQT: 36-42 Hours)

**Group E:** Min 4 units to be selected (TQT: 72-121 Hours)

**Group F:** Min 1 units to be selected (TQT: 29-30 Hours)

**Group G:** No minimum (additional units only)

**TQT:** 232-321 Hours

**GL:** 171-232 Hours

**Group A – Mandatory Units**

Unit Ref	Unit Title and ID Number	Level	TQT	GL
L1MV01	Health and Safety in the Workplace (F/508/3612)	1	29	21
L1MV02	Locating, Interpreting and Using Technical Information (J/508/3613)	1	17	12
L1MV03	Applying Engineering Techniques in an Automotive Environment (L/508/3614)	1	17	13

**Group B – Foundation Skills**

Unit Ref	Unit Title and ID Number	Level	TQT	GL
L1MV04	Knowledge Relating to Automotive Foundation Skills (R/508/3615)	1	25	17
ET133	Introduction to Low Carbon Technologies in the Automotive Industry (K/505/4248)	E3	28	20
L1MV66	Moving Loads and Vehicle Lifting (R/508/3646)	1	22	15
L1MV85	Vehicle Materials and Joining Methods (A/508/3656)	1	21	17
L1MV86	The Retail Motor Industry (F/508/3657)	1	14	13
L1MV87	Knowledge Relating to Corrosion Protection (J/508/3658)	1	12	10

**Group C – PSD**

Unit Ref	Unit Title and ID Number	Level	TQT	GL
L1MV06	Preparation to Become a Vehicle Driver (Y/508/3616)	1	10	9
L1MV07	Preparation for Riding a Motorcycle or Moped (D/508/3617)	1	10	7
L1MV08	Reducing Risks When Driving Vehicles (H/508/3618)	1	17	14
L1MV09	Introduction to Mobile Automotive Repair Trades (K/508/3619)	1	11	10
L1MV10	Introduction to Business Enterprise (D/508/3620)	1	20	12

**Group D – Health, Safety, Tools and Equipment**

Unit Ref	Unit Title and ID Number	Level	TQT	GL
L1MV11	Health and Safety Practices in a Maintenance and Repair Environment (H/508/3621)	1	20	14
L1MV12	Tools, Equipment and Consumable Materials for Vehicle Maintenance (K/508/3622)	1	21	15
L1MV15	Health and Safety Practices in a Valeting and Detailing Environment (M/508/3623)	1	18	13
L1MV16	Tools, Equipment and Consumable Materials Used for Valeting and Detailing (T/508/3624)	1	21	15
L1MV17	Health and Safety Practices in a Cycle Repair Environment (A/508/3625)	1	18	13
L1MV18	Tools, Equipment and Consumable Materials Used for Cycle Maintenance and Repair (F/508/3626)	1	20	15



**Group E – Mechanical**

Unit Ref	Unit Title and ID Number	Level	TQT	GL
L1MV20	Compression Ignition Engine System Components and Operation (F/507/9401)	1	30	22
L1MV21	Air and Liquid Cooling System Components and Operation (J/508/3627)	1	20	15
L1MV22	Lubrication System Components and Operation (L/508/3628)	1	20	15
ELMV25	Introduction to Compression Ignition Fuel Systems (Y/507/8741)	E3	18	13
L1MV26	Compression Ignition Fuel System Maintenance (R/508/3629)	1	20	15
ELMV21	Vehicle Driveline Maintenance (R/507/8737)	E3	22	17
ELMV20	Routine Vehicle Maintenance Processes and Procedures (L/507/8736)	E3	22	17
L1MV27	Vehicle Steering and Suspension System Components and Maintenance (4 wheels or more) (J/508/3630)	1	30	22
L1MV19	Spark Ignition Engine System Components and Operation (A/507/9400)	1	30	22
L1MV28	Light Vehicle Braking System Components and Maintenance (L/508/3631)	1	30	21
L1MV29	Light Vehicle Wheel and Tyre Construction and Maintenance (R/508/3632)	1	20	15
L1MV31	Light Vehicle Exhaust System Components and Maintenance (Y/508/3633)	1	20	15
ELMV22	Spark Ignition System Maintenance (Y/507/8738)	E3	18	13
ELMV24	Introduction to Spark Ignition Fuel Systems (R/507/8740)	E3	16	12
L1MV34	Heavy Vehicle Wheel and Tyre Construction and Maintenance (D/508/3634)	1	21	15
L1MV35	Heavy Vehicle Exhaust System Components and Maintenance (H/508/3635)	1	21	15
L1MV36	Heavy Vehicle Braking System Components and Maintenance (K/508/3636)	1	31	23
L1MV38	Motorcycle Steering and Suspension System Components and Maintenance (M/508/3637)	1	26	19
L1MV39	Motorcycle Braking System Components and Maintenance (T/508/3638)	1	21	15
L1MV40	Routine Motorcycle Maintenance and Service Adjustment Processes (A/508/3639)	1	24	18
L1MV41	Motorcycle Wheel and Tyre Construction and Maintenance (M/508/3640)	1	21	16
L1MV42	Motorcycle Exhaust System Components and Maintenance (T/508/3641)	1	21	16
L1MV43	Motorcycle Driveline Maintenance (A/508/3642)	1	28	21
L1MV44	Motorcycle Fuel System Maintenance (H/507/8726)	1	29	21
L1MV45	Motorcycle Spark Ignition System Maintenance (F/508/3643)	1	21	15

**Group F – Electrical**

Unit Ref	Unit Title and ID Number	Level	TQT	GL
L1MV47	Electrical Foundation Skills (J/507/9402)	1	29	21
L1MV48	Lighting System Maintenance (L/508/3645)	1	30	20

**Group G – Cycle Maintenance**

Unit Ref	Unit Title and ID Number	Level	TQT	GL
L1MV80	Remove and Replace a Cycle Gear Assembly (D/508/3651)	1	12	8
L1MV81	Carry Out a Systematic Cycle Check (H/508/3652)	1	8	4
L1MV82	Repair a Cycle Puncture (K/508/3653)	1	8	4
L1MV83	Remove and Replace a Cycle Rim Brake Assembly (M/508/3654)	1	11	6





<b>UNIT REF: L1MV01</b>	<b>UNIT TITLE: HEALTH AND SAFETY IN THE WORKPLACE</b>
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<b>Level: 1</b>	<b>GL: 21 Hours</b>	<b>TQT: 29 Hours</b>
<p><b>Overview:</b> This unit introduces learners to the health and safety knowledge requirements when carrying out simple maintenance and repair tasks in the workplace. This unit covers the general requirements of health and safety in the workplace including personal responsibilities, common hazards and risks, manual handling, health and safety information, fire prevention and emergency evacuation procedures.</p> <p>Learners are required to complete a plan of the workplace highlighting the Health and Safety information, equipment and notices.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Know health and safety requirements and information used in the workplace	1.1 State their personal responsibilities for health and safety in the workplace  1.2 Identify common hazards and risks when working in the workplace  1.3 Identify the need to be aware of the actions of others in the working environment  1.4 Locate the main health and safety information and notices provided in the workplace
2. Know the safe manual handling techniques to be used in the workplace	2.1 State safe manual handling practices and procedures  2.2 Identify common manual handling equipment used in the workplace
3. Know the local legislation procedures associated with working in the workplace	3.1 Identify the main substances hazardous to health in the workplace  3.2 State the appropriate methods to dispose of waste materials in the workplace
4. Know about fire prevention and emergency procedures	4.1 Identify the three elements that produce a fire  4.2 Identify different types of fire extinguisher and their uses  4.3 State the procedures to follow in an emergency and the evacuation of the premises
5. Be able to identify the main health and safety information, equipment and notices in the workplace	5.1 Identify the main health and safety information in the workplace  5.2 Identify the main health and safety equipment in the workplace  5.3 Identify the main health and safety notices in the workplace

<b>Evidence Requirements</b>
<b>You must be observed by your assessor completing all of the activities listed below on at least one occasion:</b>
Locating and recording the location of the main health and safety information in the workplace
Locating and recording the location of the main health and safety equipment in the workplace
Locating and recording the location of the main health and safety notices in the workplace



Unit Content	Assessment Criteria
<p><b>Personal responsibilities to include:</b></p> <ul style="list-style-type: none"> <li>• following health and safety notices and instructions</li> <li>• complying with instructions and procedures</li> <li>• using PPE and VPE equipment</li> <li>• behaving responsibly and safely</li> <li>• being aware of others</li> </ul> <p><b>Common hazards and risks associated with:</b></p> <ul style="list-style-type: none"> <li>• electrical equipment and trailing leads</li> <li>• airlines and air powered tools</li> <li>• hazardous substances such as: fuels, de greasers, cleaners, thinners</li> <li>• movement of vehicles</li> <li>• waste materials</li> <li>• loose tools and equipment</li> <li>• lifting, jacking and supporting vehicles</li> <li>• inappropriate behaviour</li> <li>• failing to use appropriate PPE and VPE</li> </ul> <p><b>Awareness of others to include:</b></p> <ul style="list-style-type: none"> <li>• the risk posed by the action and conduct of colleagues in immediate vicinity</li> <li>• the possible risks to others posed by your own actions and conduct</li> <li>• the risks posed by the type of work being carried out by colleagues</li> </ul> <p><b>Main health and safety information and notices to include:</b></p> <ul style="list-style-type: none"> <li>• fire and emergency exits</li> <li>• actions in the event of a fire or emergency</li> <li>• health and safety instructions</li> <li>• use of health and safety equipment</li> </ul>	<p>1.1, 1.2, 1.3, 1.4</p>
<p><b>Safe manual handling practices and procedures to include:</b></p> <ul style="list-style-type: none"> <li>• use of PPE</li> <li>• correct lifting technique</li> <li>• carrying technique</li> <li>• how to find current manual handling information</li> </ul> <p><b>Manual handling equipment to include:</b></p> <ul style="list-style-type: none"> <li>• jacking equipment</li> <li>• cranes</li> <li>• hoists</li> <li>• chains, slings, chains and wire ropes</li> <li>• vehicle lifts and stands</li> <li>• skates and dollies</li> <li>• trollies and sack trucks</li> </ul>	<p>2.1, 2.2</p>
<p><b>Common hazardous substances include:</b></p> <ul style="list-style-type: none"> <li>• liquids – petrol, diesel, oil, brake fluid, cleaners, paint, thinners</li> <li>• gases – exhaust, welding and heating equipment</li> <li>• solids – used and contaminated components</li> </ul> <p><b>Procedures for disposing of waste materials to include:</b></p> <ul style="list-style-type: none"> <li>• waste oil and filters</li> <li>• old units and components</li> <li>• cleaning materials</li> <li>• volatile materials – petrol filters, petrol engine components</li> <li>• used vehicle body materials, paint, thinners</li> </ul>	<p>3.1, 3.2</p>



<p><b>Fire prevention and emergency procedures to include:</b> <b>THREE elements necessary for a fire</b></p> <ul style="list-style-type: none"><li>• Oxygen</li><li>• Fuel</li><li>• Ignition source</li></ul> <p><b>Fire extinguishers to include:</b></p> <ul style="list-style-type: none"><li>• water</li><li>• powder</li><li>• gas - CO2</li></ul> <p><b>Procedures to follow in an emergency to include:</b></p> <ul style="list-style-type: none"><li>• in the event of a colleague suffering an electric shock</li><li>• in the event of a serious accident</li><li>• sounding alarm</li><li>• use of appropriate fire extinguisher</li><li>• evacuation of premises</li></ul>	<p>4.1, 4.2, 4.3</p>
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<b>UNIT REF: L1MV02</b>	<b>UNIT TITLE: LOCATING, INTERPRETING &amp; USING TECHNICAL INFORMATION</b>
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<b>Level: 1</b>	<b>GL: 12 Hours</b>	<b>TQT: 17 Hours</b>
<p><b>Overview:</b> This unit provides the learners with the basic knowledge in how to identify and access the technical information required to complete maintenance and repair activities. Learners will be expected to locate, interpret and use the technical information required for effective maintenance and repair procedures and activities.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Know where to find technical information	1.1 State the reasons for accessing technical information used in maintenance and repair  1.2 State the reasons for using technical information used in maintenance and repair
2. Know the different types and location of technical information	2.1 Identify the range of technical information types available for maintenance and repair  2.2 Locate and interpret technical information required for maintenance and repair
3. Know how to locate identification numbers on vehicles and components	3.1 Identify the vehicle registration number  3.2 Identify the location of the chassis/frame number  3.3 Identify the location of the engine number  3.4 Identify component part numbers
4. Be able to access, interpret and use technical information	4.1 Access and use technical information to locate identification and component numbers  4.2 Interpret and use technical information to carry out maintenance and repair activities

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the tasks below on <b>at least one</b> occasion: (Note: the tasks can be referenced to other appropriate units within the qualification)
Accessing and using technical information to locate identification numbers.
Interpreting and using technical information to carry out maintenance and repair activities



Unit Content	Assessment Criteria
<p><b>Reasons for accessing technical information could include:</b></p> <ul style="list-style-type: none"><li>• Manufacturers updates</li><li>• Service and maintenance information and procedure's</li><li>• Technical details</li><li>• Component manufacturers information</li><li>• Service and repair times</li></ul> <p><b>Reasons for using technical information to include:</b></p> <ul style="list-style-type: none"><li>• Service and repair times</li><li>• Settings and capacities</li><li>• Service routines</li><li>• Diagnostic information</li><li>• Wiring diagrams</li><li>• Service and repair information</li></ul>	1.1, 1.2
<p><b>Identifying, locating and interpreting the range of technical information sources to include:</b></p> <ul style="list-style-type: none"><li>• Manufacturer online facilities</li><li>• Component manufacturers information, including Web site information</li><li>• Parts books and references</li><li>• Service recalls</li><li>• Computer-based service and repair information</li><li>• Service manuals</li><li>• Different types of service publications</li><li>• Wall charts</li></ul>	2.1, 2.2
<p><b>Location of identification numbers could include:</b></p> <ul style="list-style-type: none"><li>• Vehicle registration number</li><li>• Vehicle Identification Numbers (VIN)</li><li>• Identification numbers</li><li>• Engine</li><li>• Transmission</li><li>• Chassis/frame plates</li><li>• Part numbers</li><li>• Paint codes</li><li>• Component part numbers</li></ul>	3.1-3.4



<b>UNIT REF: L1MV03</b>	<b>UNIT TITLE: APPLYING ENGINEERING TECHNIQUES IN AN AUTOMOTIVE ENVIRONMENT</b>
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<b>Level: 1</b>	<b>Total Unit Hours: 17</b>
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**Overview:** This unit will provide the candidate with the knowledge and skills to use engineering techniques to include: measuring, marking out, and drilling. The candidate will use a variety of fixing methods to accurately fit vehicle number plates.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know how to select and wear the correct PPE and work safely	1.1 Identify and wear the correct PPE and work safely throughout the task
2 Know about vehicle materials	2.1 Use suitable methods to identify vehicle materials to include: a. Steels b. Aluminium c. Plastics
3 Know how to use templates, and automotive/engineering tools	3.1 List tools for: a. Measuring b. Marking out c. Drilling d. Fixing and securing mechanical fastenings  3.2 State the advantages of preparing and using templates, prior to fitting vehicle number plates.
4 Know a variety of mechanical and adhesive fixings and fastenings	4.1 List different types of fixings and fastenings, which are suitable to secure vehicle number plates to include: a. Mechanical b. Adhesive
5 Be able to use templates, and automotive / engineering tools to fit vehicle number plates	5.1 Demonstrate how to carry out checks to tools prior to their use  5.2 Demonstrate how to clean and prepare surfaces prior to fitting vehicle number plates  5.3 Demonstrate the use of templates and automotive/engineering tools
6 Be able to clean the work area and leave it in a safe condition	6.1 Use appropriate equipment and methods to clean the work area and leave it in a safe condition

Evidence Requirements
You <b>must be observed by your assessor</b> completing the task listed below on <b>at least one</b> occasion:
measuring, marking out and drilling
fitting a set of vehicle number plates



Unit Content	Assessment Criteria
<b>PPE for the workshop include:</b> <ul style="list-style-type: none"><li>• overalls</li><li>• boots</li><li>• skin protection</li><li>• eye protection</li><li>• ear protection</li></ul> <b>Include safe working practices specific to this unit</b>	1.1
<b>Vehicle material to include:</b> <ul style="list-style-type: none"><li>• identification of materials – visual, identification codes and technical data / repair research method information</li><li>• materials – vehicle steels, thermoplastic, thermoset plastic and aluminium</li></ul>	2.1-2.2
<b>Know and use of templates, and automotive / engineering tools to include:</b> <ul style="list-style-type: none"><li>• tools and equipment to include- Tape measure, ruler, masking tape, marking equipment, hand drill (electric, air, battery) screwdrivers, rivet gun</li><li>• techniques to avoid damage to vehicle paintwork, components and trim</li><li>• quality checks</li><li>• ensure all tools are in good condition and suitable for the job</li><li>• the use of prepared templates to aid accurate fitting</li><li>• legal requirements</li><li>• alignment</li><li>• securing</li></ul>	3.1-3.2
<b>Fixings and fastenings to include:</b> <ul style="list-style-type: none"><li>• suitable fixing tapes and adhesives</li><li>• plastic screws, nuts, security fastenings and rivets / rivet nuts</li></ul>	4.1



<b>UNIT REF: L1MV04</b>	<b>UNIT TITLE: KNOWLEDGE RELATING TO AUTOMOTIVE FOUNDATION SKILLS</b>
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<b>Level: 1</b>	<b>GL: 17 Hours</b>	<b>TQT: 25 Hours</b>
<p><b>Overview:</b> This unit will enable the learner to develop the knowledge for tools, equipment, measuring devices and materials used in simple repair, servicing, maintenance activities and the materials used in vehicle construction: Learning outcome 1 relates to the knowledge required when using a range of mechanical measuring and electrical equipment, locking and securing devices, hand tools and workshop equipment used within a workplace environment. Learning outcome 2 introduces the learners to the range of materials and their applications used in vehicle construction.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Know the basic tools, equipment and measuring devices used within a workplace environment	1.1 State the main units of measurement related to automotive repair  1.2 Identify the main measuring equipment used in an automotive environment  1.3 State the basic principles of electrical circuits and components  1.4 Identify electrical measurement equipment used in an automotive environment  1.5 Identify locking and securing devices used in an automotive environment  1.6 Identify common hand tools used in an automotive environment  1.7 Identify common workshop equipment used in the automotive environment
2. Know the materials used in vehicle construction	2.1 Identify the ferrous, non-ferrous and non-metallic materials used in vehicle construction  2.2 Identify the applications of ferrous and non-ferrous materials used in vehicle construction  2.3 State the common terms applied to the materials used in vehicle construction





Unit Content	Assessment Criteria
<p><b>The main units of measurement related to vehicle repair include:</b></p> <ul style="list-style-type: none"> <li>Length, Area, Volume, Mass, Force, Velocity, Pressure, Temperature, Torque</li> </ul> <p><b>Measuring equipment include:</b></p> <ul style="list-style-type: none"> <li>Rule/Tape, Calliper, Feeler Gauge, Volume Measures, Vernier Calliper, Micrometer, Dial Gauges, Torque Wrenches, Multimeter, Pressure gauge</li> </ul> <p><b>The basic principles of electricity and electrical circuits include:</b></p> <ul style="list-style-type: none"> <li>Basic electrical units; volts, amps, ohms, watts</li> <li>The basic principle of alternating and direct current.</li> <li>Ohms law to resolve simple electrical problems.</li> <li>Series and parallel circuits.</li> <li>The main electrical symbols; battery, switch, fuse, lamp, cables joined, cables crossed, relay, resistor</li> <li>Simple electrical wiring diagrams.</li> <li>Electrical conductors e.g. gold, silver, copper, brass</li> <li>Electrical insulators e.g. rubber, Bakelite, plastic, paper, air</li> </ul> <p><b>Electrical measurement equipment include:</b></p> <ul style="list-style-type: none"> <li>The difference between analogue and digital electrical meters.</li> <li>The advantage and uses of digital and analogue meters.</li> <li>The use of ammeter, voltmeter, ohmmeter and multi-meter.</li> <li>Multi-meters for simple electrical measurements; voltage, volt drop, current flow, circuit/component resistance</li> </ul> <p><b>Locking devices and securing devices include:</b></p> <ul style="list-style-type: none"> <li>Fixing devices; nuts, bolts and screws,</li> <li>Locking and securing devices; lock nuts, split pins, locking wire, tab washers, chemical thread locking</li> <li>Screw threads, types and applications.</li> </ul> <p><b>Common hand tools to include:</b></p> <ul style="list-style-type: none"> <li>Files, hacksaw, hammers, screwdrivers, pliers, types of spanner, sockets, torque wrenches, feeler gauge, micrometer, punches, air drill, electrical hand drill, drill bits, vices, taps and dies, broken stud removers,</li> <li>The use and care of common hand tools</li> </ul> <p><b>Workshop equipment include:</b></p> <ul style="list-style-type: none"> <li>Common workshop equipment: hydraulic jacks /scissor jacks, axle stands / paddock stands, pillar drills, air tools, vehicle lifts, cranes, hoists, dollies, skates</li> <li>The preparation and use of workshop equipment.</li> </ul>	<p>1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7</p>
<p><b>Materials and applications used in light vehicle construction include:</b></p> <p><b>Ferrous and non-ferrous metals:</b></p> <ul style="list-style-type: none"> <li>carbon steel, steel alloys, cast iron, aluminium, brass, copper, lead</li> </ul> <p><b>Non- metallic materials:</b></p> <ul style="list-style-type: none"> <li>Glass, safety glass, reinforced plastic, Kevlar, rubber</li> </ul> <p><b>Applications of materials in vehicle construction include:</b></p> <ul style="list-style-type: none"> <li>Vehicle bodies, bumpers, wheels, interior components, steering and suspension components</li> </ul> <p><b>Terms relating to metals:</b></p> <ul style="list-style-type: none"> <li>Hardness, toughness, ductility, elasticity, tenacity, malleability, plasticity</li> </ul> <p><b>Terms relating to vehicle components:</b></p> <ul style="list-style-type: none"> <li>tensile stress, compressive stress, yield stress, shear force</li> </ul>	<p>2.1, 2.2, 2.3</p>



<b>UNIT REF: ET133</b>	<b>UNIT TITLE: INTRODUCTION TO LOW CARBON TECHNOLOGIES IN THE AUTOMOTIVE INDUSTRY</b>
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<b>Level: 1</b>	<b>GL: 20 Hours</b>	<b>TQT: 28</b>
<b>Mapping: Based on IMI SSC Electric vehicle NOS 2011</b>		
<b>Overview:</b> This unit aims to encourage learners to realise how their actions in driving vehicles can impact the environment and some of the measures vehicle manufacturers are taking to reduce carbon outputs.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner should be taught:</b>
1 Know how their own actions can affect the environment	1.1 Examples of driving styles that harm the environment to include: <ul style="list-style-type: none"> <li>a excessive acceleration</li> <li>b excessive deceleration</li> <li>c driving at high speed</li> <li>d idling engine whilst stopped</li> <li>e incorrect gear selection</li> <li>f use of auxiliary equipment e.g. air conditioning</li> </ul> 1.2 Examples how they can reduce carbon emissions when travelling to include: <ul style="list-style-type: none"> <li>a carefully planned routes</li> <li>b use motor transport less- walk, cycle</li> <li>c car sharing</li> <li>d use public transport</li> <li>e more efficient vehicles- lower engine size, alternative fuel vehicles</li> <li>f correctly inflated tyres</li> <li>g properly serviced and maintained vehicles</li> <li>h do not carry excessive loads e.g. empty boot</li> <li>i keep windows closed to reduce drag</li> </ul>
2 Know the impact that a conventional vehicle has on the environment	2.1. The exhaust emissions that a conventional vehicle produces to include: <ul style="list-style-type: none"> <li>a carbon monoxide</li> <li>b carbon dioxide</li> <li>c oxides of nitrogen</li> <li>d sulphur dioxide</li> <li>e soot particles</li> <li>f hydrocarbons</li> </ul> 2.2 The impact of exhaust emissions on people and the environment to include: <ul style="list-style-type: none"> <li>a carbon monoxide – colourless, odourless, poisonous to animal life</li> <li>b carbon dioxide – greenhouse gas that contributes to global warming</li> <li>c oxides of nitrogen – can cause respiratory conditions, smog and acid rain</li> <li>d sulphur dioxide – pollution and acid rain</li> <li>e soot particles – causes respiratory problems and cancers</li> <li>f hydrocarbons - causes respiratory problems, liver damage and cancers</li> </ul> 2.3 The meaning of ‘carbon footprint’ to include: <ul style="list-style-type: none"> <li>a the amount of greenhouse gases</li> <li>b most commonly carbon dioxide</li> <li>c produced over the life time of a vehicle</li> <li>d during the manufacture, running and disposal of the vehicle at the end of its working life.</li> </ul>



<p>3 Know some of the actions vehicle manufacturers' are taking to reduce carbon emissions</p>	<p>3.1 The common vehicle parts that may be recycled to include:</p> <ul style="list-style-type: none"><li>a metals</li><li>b plastics</li><li>c oils</li><li>d other fluids e.g. brake fluid and antifreeze</li><li>e batteries</li><li>f refrigerant from air conditioning systems</li><li>g glass</li><li>h tyres</li></ul> <p>3.2 The new types of propulsion available in modern and future vehicles to include:</p> <ul style="list-style-type: none"><li>a low emission conventional engine</li><li>b alternative fuels including LPG and bio-fuel engines</li><li>c hybrid</li><li>d electric</li><li>e hydrogen powered vehicles</li></ul> <p>3.3. The benefits of alternative fuel types and propulsion methods for the user and environment to include:</p> <ul style="list-style-type: none"><li>a low emission conventional engine, e.g. lean burn-improvement on normal engines, but not vastly</li><li>b alternative fuels including LPG and bio-fuel engines - normally uses a mixture of normal fuels and gas, or fuels produced from vegetable or plant extracts resulting in reduced engine emissions, renewable, and less processing required than crude oil</li><li>c hybrid vehicles using a combination of power sources such as conventional engine and electric motors - resulting in reduced emissions, improved fuel consumption</li><li>d electric vehicles using solely electric motors to propel the vehicle. Benefits are zero emissions and low running cost, but expensive at present and limited range - expected to increase in numbers considerably over the next few years</li><li>e hydrogen powered vehicles- zero emissions but limited availability and hazardous</li></ul> <p>3.4 How bio-fuels can reduce carbon emissions to include:</p> <ul style="list-style-type: none"><li>a potential to reduce greenhouse gases because the carbon in the plant matter from which the fuel is produced comes from the carbon dioxide absorbed by the plants over the course of its life, unlike fossil fuels where the carbon has been locked up under ground for millions of years and then released to the atmosphere as carbon dioxide when burnt during combustion.</li><li>b impact on land being used for growing fuel crops instead of food crops.</li></ul>
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No Content or Evidence Requirements



<b>UNIT REF: L1MV66</b>	<b>UNIT TITLE: MOVING LOADS AND VEHICLE LIFTING</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT: 22 Hours</b>
<p><b>Overview:</b> This unit introduces the learner to the knowledge and skills essential for the safe working operations when manually lifting, moving loads and when using manual handling equipment. The unit also covers the use of vehicle lifting and securing equipment, learners are required to use effective and safe working practices whilst using this equipment.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Know the risks of manual handling and moving loads.	1.1 Identify the PPE to be used when using moving and lifting equipment 1.2 Outline local manual handling guidelines and regulations. 1.3 Identify personal hazards and risks associated with lifting and moving heavy objects and loads. 1.4 Identify hazards and risks with lifting and moving heavy objects and loads using appropriate equipment.
2 Know appropriate methods of lifting, moving and securing heavy loads.	2.1 Identify a range of equipment for lifting, moving and securing loads. 2.2 State the purpose of different types of equipment for lifting, moving and securing loads. 2.3 State the safe use of lifting and moving load equipment. 2.4 Identify the visual checks to be made on lifting, moving and securing equipment prior to use..
3 Know safe manual handling procedures.	3.1 Outline the methods and precautions to be taken when lifting, moving and securing loads manually. 3.2 Outline the methods and precautions to be taken when lifting, moving and securing loads using lifting/moving equipment. 3.3 Outline the methods and precautions to be taken when lifting and supporting a vehicle.
4 Be able to use safe manual handling procedures.	4.1 Locate the information to lift and secure the vehicle safely. 4.2 Demonstrate the methods to manually lift, move and secure an engine / transmission component. 4.3 Demonstrate the methods to lift, move and secure an engine / transmission using lifting/moving equipment. 4.4 Use appropriate lifting and supporting equipment to raise and secure a vehicle safely.
5 Be able to clean the work area and leave in a safe condition.	5.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.



Evidence Requirements
You <b>must be observed by your assessor</b> completing the following tasks below on <b>at least one</b> occasion: (Note: this tasks can be referenced to other appropriate units within the qualification.)
Locating the information to lift and secure the vehicle safely
Lifting, moving and securing an engine / transmission component using safe manual handling guidelines.
Lifting, moving and securing an engine / transmission using lifting/moving equipment safely.
Lifting and supporting a vehicle using appropriate equipment safely.

Unit Content	Assessment Criteria
<p><b>PPE to include:</b></p> <ul style="list-style-type: none"> <li>• Safety boots, safety hat, overalls, safety gloves, reflective jacket/tabard</li> </ul> <p><b>Manual handling guidelines to include:</b></p> <ul style="list-style-type: none"> <li>• Local manual handling operating regulations and guidelines that individuals and employers need to follow. Risk assessments.</li> </ul> <p><b>The risks of lifting and moving heavy objects including pain and injury to:</b></p> <ul style="list-style-type: none"> <li>• Arms, legs and joints, slips, trips, and repetitive strain injuries of various sorts.</li> </ul> <p><b>The risks of lifting and moving heavy objects using mechanical equipment include:</b></p> <ul style="list-style-type: none"> <li>• Using equipment in a safe manor</li> <li>• Not putting others at risk whilst moving heavy objects</li> <li>• Maintaining mechanical equipment used for moving loads</li> <li>• No unauthorised use of mechanical equipment</li> </ul>	1.1, 1.2, 1.3, 1.4
<p><b>Range and purpose of equipment to lift, move and secure loads include:</b></p> <ul style="list-style-type: none"> <li>• trolley</li> <li>• engine hoist</li> <li>• jacks</li> <li>• crane</li> <li>• hoists</li> <li>• sack and pallet truck</li> <li>• axle stands</li> <li>• vehicle lifts</li> <li>• dollies and skates</li> <li>• air jacks</li> <li>• chains, slings and wire ropes</li> </ul> <p><b>Safe use of equipment for lifting and moving loads to include:</b></p> <ul style="list-style-type: none"> <li>• use of PPE</li> <li>• safe working loads (SWL) lifting capacity</li> <li>• care when moving loads over uneven surfaces</li> <li>• appropriate selection of equipment for the task</li> <li>• avoiding obstructions and floor based obstacles- cables and leads</li> <li>• safe working environment for equipment being used</li> <li>• stability of loads whilst being moved</li> <li>• condition and well maintained equipment</li> </ul> <p><b>Visual checks include:</b></p> <ul style="list-style-type: none"> <li>• leaks and mechanical condition</li> <li>• physical damage</li> <li>• seized or broken components</li> <li>• correct operation of components</li> <li>• damaged wiring</li> <li>• cuts and frayed straps</li> <li>• cracks and bent structures</li> <li>• certificates of conformity (insurance)</li> </ul>	2.1, 2.2, 2.3, 2.4



Unit Content Contd.	Assessment Criteria
<p><b>Moving loads manually to include:</b></p> <ul style="list-style-type: none"><li>• safe personal lifting limits</li><li>• use of PPE</li><li>• planning the lift</li><li>• adopting a safe position</li><li>• feet position</li><li>• where is the load going to</li><li>• will I need help with lifting the load</li><li>• removal of obstructions from packaging</li><li>• will I need to change grip in moving the load</li></ul> <p><b>Lifting and moving loads using mechanical equipment to include:</b></p> <ul style="list-style-type: none"><li>• working within the Safe Working Limits (SWL) of the equipment</li><li>• training and authorised to use mechanical equipment</li><li>• equipment condition</li><li>• follow safe procedures when using mechanical equipment</li><li>• informing others</li><li>• reporting of faults of equipment to authorised persons</li><li>• safe, secure and level ground loads will be transported across</li><li>• using equipment risk assessments</li></ul> <p><b>Lifting and supporting a vehicle to include:</b></p> <ul style="list-style-type: none"><li>• inspect the floor jack or lift for fluid leaks before use</li><li>• using vehicle manufacturer specifications for vehicle weight.</li><li>• using manufacturer specifications for axle stand capacity.</li><li>• following correct procedure when using floor jacks and vehicle lifts</li><li>• ensure the vehicle is placed on a hard, level surface</li><li>• raising the vehicle using manufacturer specified lifting points</li><li>• when the vehicle is raised, it must be supported</li><li>• chock wheels before removing the jack</li><li>• use vehicle manufacturer specifications for vehicle weight.</li></ul>	3.1, 3.2, 3.3



<b>UNIT REF: L1MV85</b>	<b>UNIT TITLE: VEHICLE MATERIALS AND JOINING METHODS</b>
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<b>Level: 1</b>	<b>GL: 17Hours</b>	<b>TQT: 21 Hours</b>
<b>Overview:</b> This unit will provide the learner with the knowledge and skills to identify and locate a range of vehicle materials, joining methods and chassis layouts.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know different vehicle construction materials and their applications	1.1 Identify vehicle construction materials 1.2 State applications for different vehicle construction materials
2 Know different methods of constructing vehicles	2.1 Identify different methods of assembling vehicles 2.2 Identify methods of joining vehicle panels and structures
3 Know the properties of vehicle construction materials	3.1 State the properties of vehicle construction materials
4 Know different types of chassis design	4.1 Identify types of vehicle chassis
5 Be able to use researched repair methods to identify different construction materials	5.1 Demonstrate how to use researched repair methods to identify vehicle materials

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing all of the following tasks on <b>at least one</b> occasion.
<b>Using research repair methods to identify the:</b>
body panel material
type of plastic used for the bumpers
the joining methods used on the rear quarter panel



Unit Content	Assessment Criteria
<p><b>Identify vehicle construction materials to include:</b></p> <ul style="list-style-type: none"><li>• glass</li><li>• plastic</li><li>• mild steel</li><li>• high strength steel</li><li>• aluminium</li><li>• carbon fibre</li><li>• fibreglass / glass reinforced plastic</li></ul> <p><b>Applications for different vehicle construction materials to include:</b></p> <ul style="list-style-type: none"><li>• glass - vehicle windscreens, roofs and side windows, rear quarter light window</li><li>• plastic - bumpers and trims</li><li>• mild steel - body panels and chassis</li><li>• high strength and ultra-high strength steel - passenger cell, structural panels, and body panels</li><li>• aluminium - body panels and trim</li><li>• carbon fibre - body panels and trims</li><li>• SMC / fibreglass / glass reinforced plastic - vehicle bodies, panels and aftermarket spoilers and body kits</li></ul>	1.1-1.2
<p><b>Different methods of assembling vehicles to include:</b></p> <ul style="list-style-type: none"><li>• vehicle manufactures - assembly lines and factories</li><li>• handmade</li></ul> <p><b>Methods of joining vehicle panels and structures:</b></p> <ul style="list-style-type: none"><li>• welding</li><li>• brazing</li><li>• a range of mechanical fastenings which are appropriate to secure vehicle panels</li><li>• clinching, and folded edges</li><li>• structural adhesives (single and 2 pack)</li></ul>	2.1-2.2
<p><b>The properties of vehicle construction materials to include:</b></p> <ul style="list-style-type: none"><li>• lightweight</li><li>• corrosion resistance</li><li>• strength</li><li>• joining</li><li>• moulding</li><li>• flexibility</li><li>• behaviour when involves in a collision</li></ul>	3.1
<p><b>Identify vehicle chassis types to include:</b></p> <ul style="list-style-type: none"><li>• separate chassis / ladder chassis</li><li>• monocoque</li></ul>	4.1





<b>UNIT REF: L1MV86</b>	<b>UNIT TITLE: THE RETAIL MOTOR INDUSTRY</b>
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<b>Level: 1</b>	<b>GL: 13 Hours</b>	<b>TQT: 14 Hours</b>
<b>Overview:</b> This unit will provide the learner with the knowledge of organisations within the retail motor industry, in addition to this, the learner will identify trade associations and how to qualify for professional registers.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know vehicle repair organisations within the retail motor industry	1.1 Identify the different types of vehicle repair organisations 1.2 Outline the basic structure of a typical vehicle repair business 1.3 Outline the function of a franchised dealership compared with an independent workshop 1.4 State the main procedures which are involved when receiving a vehicle for repair 1.5. Give examples of communication methods in a workshop / dealership and when they may be appropriate 1.6 Indicate sources of information used in vehicle repair
2 Know different trade associations	2.1 Identify a range of trade associations 2.2 State the benefits of trade associations
3 Know the benefits of automotive professional registers	3.1 Identify the purpose of automotive professional registers 3.2 State how to qualify for professional registers 3.3 Outline the benefits of professional registers

Unit Content	Assessment Criteria
<b>Different types of vehicle repair organisations</b> <ul style="list-style-type: none"> <li>• franchise dealer</li> <li>• Independent repairer</li> <li>• fast fit</li> <li>• fleet operator</li> <li>• specialist repairers - SMART repair, automatic transmissions</li> <li>• body repairer</li> <li>• vehicle valeting</li> <li>• breakdown services - AA, RAC</li> </ul> <b>Definition of terms to include :</b> <ul style="list-style-type: none"> <li>• approved repairer</li> <li>• multi-franchise dealer</li> <li>• aftersales</li> </ul> <b>The basic structure of a typical vehicle repair business to include:</b> <ul style="list-style-type: none"> <li>• manger</li> <li>• assistant manager</li> </ul>	1.1-1.6

- quality control
- reception staff
- vehicle damage assessor
- technician
- valeter
- driver
- parts person
- service staff
- administration
- sales
- cleaners
- supervisors
- security staff

**The functions of the main sections of a typical vehicle repair business to include:**

- service reception
- bodyshop
- vehicle repair workshop
- MOT bay
- SMART repair
- vehicle recovery
- vehicle valeting
- parts department
- main office
- vehicle sales
- warranty
- how these areas must connect to provide service to the customer

**The function and benefits of a Franchise Dealership to include:**

- differences between a franchise dealership and independent repairer
- expert staff answering the customers questions
- support from a manufacturer for repairs and warranty work
- experts on a particular brand
- latest deals
- part-exchange deals
- a range of demonstrators models
- finance
- leasing facility / deals

**The main procedures when receiving a vehicle for repair to include:**

- carrying out pre and post work checks
- organising, issuing and monitoring courtesy vehicles
- locating and using correct documentation and information
- specific procedures for carrying out repairs and servicing
- identifying vehicle specifications and component specifications
- identifying oil and fluid specifications
- identifying and locating specialist equipment and tools
- referencing vehicle and component identification codes
- recording vehicle repairs and maintenance – job cards, completion of service books

**Identify procedures for:**

- the referral of problems
- the reporting of delays
- authorising additional work which has been identified during repair or maintenance
- accessing help or assistance

**Workshop procedures which promote:**

- care of the customer's vehicle
- care of the customer's personal possessions
- the vehicle presentation when returning it to the customer



**Methods of communication in a workshop/dealership to include:**

- word of mouth
- discussions
- passing on information
- carrying out instructions
- drawings/sketches and repair methods
- telephone
- vehicle job cards
- posted communication (i.e. notice boards)
- vehicle manufacturer’s bulletins
- email
- internet
- text
- video conferencing
- internet communication -Skype, FaceTime
- online manufacturers data / subscriptions, for example repair methods

**The effectiveness of each of the above forms of communication in terms: conveying information:**

- accurately
- enough information
- promptly

**Include how distance, location or job responsibility can determine lines of communication**

**How communication of information may change when given to informed and un-informed people**

**Outline the importance of:**

- listening skills
- asking questions
- requesting assistance or advice
- developing relationships with colleagues
- courtesy
- politeness
- listening skills
- tone and attitude

**Sources of information used in vehicle repair to include:**

- vehicle and equipment manuals
- parts lists
- diagnostic - scopes and graphs
- internet based
- technical data sheets
- health and safety data sheets
- repair methods
- drawings
- printouts - emissions
- job cards
- checklists

**Identify and provide examples of trade associations which represent the motor industry**

**Benefits of trade associations to include:**

- the representation of franchised car and commercial vehicle dealers, independent garages, bodyshops, motorcycle dealers and providers of sales and services to motorists and businesses
- their influence on motor trade matters
- their focus on raising quality and standards throughout the industry
- how they guide and support members
- how they aid in promoting best practice

2.1-2.2



<ul style="list-style-type: none"><li>• their campaigning for the retail motor industry, and includes lobbying parliament / government</li><li>• how they help and provide advice on customer or employee problems, legal issues, compliance and trading standards</li><li>• how they assist members with finance, insurance, warranties, energy, tools etc.</li></ul>	
<p><b>Identify the purpose of automotive professional registers</b></p> <ul style="list-style-type: none"><li>• professional registers identifies individuals in the automotive industry who have been recognised for their experience, professionalism and commitment to ethical working practices and for continually keeping their knowledge and skills up to date with industry training</li></ul> <p><b>State how to qualify for professional registers by:</b></p> <ul style="list-style-type: none"><li>• levels of qualification / achievements</li><li>• being employed in the motor industry and have a certain amount of industry experience</li><li>• application</li><li>• providing evidence of continual learning and development activities to remain on the register</li><li>• industry professional body membership (post nominal letters)</li></ul> <p><b>The benefits of professional registers:</b></p> <ul style="list-style-type: none"><li>• assists in raising standards within the motor trade</li><li>• displays professional knowledge, skills and competence</li><li>• provides assurance to customers of a quality service</li><li>• increases public and consumer confidence in the industry</li></ul>	<p>3.1-3.3</p>



<b>UNIT REF: L1MV87</b>	<b>UNIT TITLE: KNOWLEDGE RELATING TO CORROSION PROTECTION</b>
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<b>Level: 1</b>	<b>GL: 10 Hours</b>	<b>TQT: 12 Hours</b>
<b>Overview:</b> This unit will provide the learner with the knowledge of how to protect vehicle bodies from corrosion by applying suitable products to areas such as: the backside of panels and vehicle body cavities.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know the purpose of the corrosion protection process.	1.1 State the reasons for applying corrosion protection materials 1.2 Identify areas where corrosion protection materials are used
2 Know the tools and equipment which are used to apply corrosion protection materials.	2.1 Identify tools and equipment which are used to apply corrosion protection materials 2.2 State the uses for tools and application equipment 2.3 Outline how to set up corrosion protection application equipment
3 Know how to apply corrosion protection materials.	3.1 Identify information which supports the application of corrosion protection materials 3.2 Identify corrosion protection materials and their appropriate uses 3.3 Outline different methods of applying corrosion protection materials
4 Know how to prevent damage to corrosion protection materials.	4.1 Give examples of how corrosion protection materials may become damaged 4.2 Outline how to prevent corrosion protection materials from becoming damaged

<b>Unit Content</b>	<b>Assessment Criteria</b>
<b>Reasons for applying corrosion protection materials to include:</b> <ul style="list-style-type: none"> <li>• protecting vehicle body cavities</li> <li>• repelling water and moisture</li> <li>• replacing the original protection after completing body repairs</li> <li>• maintain manufacturers warranties</li> <li>• protecting the underbody of the vehicle</li> </ul>	1.1, 1.2
<b>Areas where corrosion protection materials are used to include:</b> <ul style="list-style-type: none"> <li>• vehicle body cavities</li> <li>• internal sill sections</li> <li>• the backside of body panels, such as doors and tailgates</li> <li>• the underbody of the vehicle</li> <li>• under the wheel arches</li> <li>• welded seams</li> <li>• under the bonnet</li> </ul>	
<b>Tools and equipment which are used to apply corrosion protection materials to include:</b> <ul style="list-style-type: none"> <li>• different types of compressed air spray gun</li> <li>• a selection of interchangeable lances</li> <li>• attachments</li> </ul>	2.1, 2.2, 2.3



<ul style="list-style-type: none"> <li>• paint brushes</li> </ul> <p><b>Uses for tools and application equipment to include:</b></p> <ul style="list-style-type: none"> <li>• applying the corrosion protection materials</li> <li>• lances providing 360° spraying and long reach capabilities</li> <li>• accessing internal and restricted areas</li> </ul> <p><b>How to set up application equipment to include:</b></p> <ul style="list-style-type: none"> <li>• setting the spraying pressure</li> <li>• adjusting the fan</li> <li>• fitting the attachments</li> <li>• attaching the lances</li> <li>• adjusting the flow of the material</li> <li>• testing prior to use</li> </ul>	
<p><b>Information which supports the application of corrosion protection materials to include:</b></p> <ul style="list-style-type: none"> <li>• material safety data sheets</li> <li>• technical data sheet</li> <li>• manufacturers guidance and instructions</li> <li>• researched repair methods</li> </ul> <p><b>Corrosion protection materials and their appropriate uses to include:</b></p> <ul style="list-style-type: none"> <li>• underbody seal types ('Schutz')</li> <li>• cavity wax types</li> <li>• suitability and where to use different materials</li> <li>• different coloured and clear materials</li> <li>• vehicle manufactures recommendations and material specifications</li> </ul> <p><b>Different methods of applying corrosion protection materials to include:</b></p> <ul style="list-style-type: none"> <li>• paint brush</li> <li>• spray gun</li> <li>• aerosol</li> </ul>	<p>3.1, 3.2, 3.3</p>
<p><b>Examples of how corrosion protection materials may become damaged to include:</b></p> <ul style="list-style-type: none"> <li>• stones and rough ground</li> <li>• collision damage</li> <li>• jacking a vehicle</li> <li>• raising a vehicle on a lift / ramp</li> <li>• using 'wheel free' lift arrangements</li> <li>• during panel repair and replacement</li> </ul> <p><b>How to prevent corrosion protection materials from becoming damaged to include:</b></p> <ul style="list-style-type: none"> <li>• carrying out checks to ensure lifting and jacking equipment has suitable pads and protection</li> <li>• using protection between the underbody panels and 'wheel free' lifting arrangements</li> <li>• protecting the coatings from intense heat</li> <li>• protecting the surrounding areas during repair</li> <li>• removing the minimum amount of the protective coating during repairs</li> </ul>	<p>4.1, 4.2</p>



<b>UNIT REF: L1MV06</b>	<b>UNIT TITLE: PREPARATION TO BECOME A VEHICLE DRIVER</b>
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<b>Level: 1</b>	<b>GL: 9 Hours</b>	<b>TQT: 10 Hours</b>
<p><b>Overview:</b> This unit will provide the learner with the knowledge which learner drivers need to know before they begin to drive. This includes applying for their first driving licence, becoming familiar with the Highway Code, arranging driving lessons and the booking a driving test.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Know the process of applying for their first driving licence	1.1. State the name given to a 'first' driving licence 1.2. Identify an organisation that deals with driving licence applications 1.3. Identified the age of which a person can apply for their first driving licence 1.4. List reasons why a person may be refused a first licence
2. Know the purpose of the Highway Code	2.1. Outline the purpose of the Highway Code 2.2. Give examples of the content in the Highway Code 2.3. List various formats of the Highway Code
3. Know the meaning of a sample of road safety signs	3.1. State the meaning of a sample of common road signs
4. Know how to identify an approved driving school and instructors	4.1. Give examples of things to consider when choosing a driving school and instructor 4.2. State who to contact regarding poor service or behaviour from: a. A driving school b. Driving instructor
5. Know the content of both the theory and practical driving tests	5.1. Use simple research methods to identify the content and timescale of the: a. Driving theory test b. Practical driving test 5.2. Locate a driving test centre 5.3. List different methods of booking a driving test 5.4. State what documents must be produced at the driving test 5.5. Identify vehicle problems and faults that may prevent it being used for the driving test

**Please note: This unit is intended for those individuals that have not yet applied for a driving licence. If a learner has already obtained a full driving licence this cannot be used as evidence to meet the learning outcomes of this unit.**



The content below is a guide, therefore, the latest driving standards must be consulted to ensure the information delivered to the learners is accurate and up to date.

Unit Content	Assessment Criteria
<p><b>Applying for your first driving licence to include:</b></p> <ul style="list-style-type: none"> <li>• how to apply – various stages / process</li> <li>• provisional licence – restrictions, use of red L plates, supervision when driving (include requirements of the person supervising) and motorways etc.</li> <li>• requirements to qualify for a provisional licence – reasons for being prevented from driving</li> <li>• where to apply for a provisional licence</li> <li>• methods of application – post, online etc.</li> <li>• when / age to apply</li> </ul>	1.1-1.4
<p><b>Recognise the Highway Code and its content to include:</b></p> <ul style="list-style-type: none"> <li>• why it is essential – help reduce road casualties</li> <li>• who it applies to - road users and pedestrians</li> <li>• legal implications in the Highway Code – may be prosecuted if disobeyed and used in evidence</li> <li>• content – information for road users, pedestrians, and road signs</li> <li>• formats: audiobook, app, paperback book, etc.</li> </ul> <p><b>Know a range of road signs to include:</b></p> <ul style="list-style-type: none"> <li>• shapes</li> <li>• colours</li> <li>• meanings</li> <li>• mandatory</li> <li>• warning</li> <li>• regulatory</li> <li>• speed limits</li> </ul>	2.1- 3.1
<p><b>Driving lessons and learning to drive to include:</b></p> <ul style="list-style-type: none"> <li>• driver and Vehicle Standards Agency</li> <li>• L plates rules – colour and positioning</li> <li>• finding driving lessons and instructors – display badges, pricing, offers, reputation and courses.</li> <li>• complaints about an approved instructor - Trading Standards Office and Citizens Advice Bureau (for poor service) Driver and Vehicle Standards Agency (for unacceptable behaviour and illegal instructors)</li> <li>• rules for practising with family and friends - see current rules for supervising learner drivers</li> </ul>	4.1, 4.2
<p><b>The driving test to include:</b></p> <p><b>The theory test:</b></p> <ul style="list-style-type: none"> <li>• how to book a driving test – indicate any additional needs or requirements prior to the test, for example dyslexia.</li> <li>• content of the test – timescale, format and practise material</li> <li>• how to locate a theory test centre – research methods, Government websites</li> </ul> <p><b>The driving test:</b></p> <ul style="list-style-type: none"> <li>• booking the test – highlight any additional needs or requirements before the test</li> <li>• the purpose of the test – drive safely in different road and traffic conditions, know the Highway Code and meet the standard required.</li> <li>• documents to take to the test – theory test certificate and driving licence</li> <li>• what happens during the test – timescale, manoeuvres, types of instruction, routes and know current driving standards</li> <li>• car rules and suitability if used during a driving test – correct documentation, meet the required speed limits, correctly fitted L plates, no warning lights illuminated (e.g., airbag warning light permanently illuminated), check current requirements</li> </ul>	5.1- 5.5





<b>UNIT REF: L1MV07</b>	<b>UNIT TITLE: PREPARATION FOR RIDING A MOTORCYCLE OR MOPED</b>
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<b>Level: 1</b>	<b>GL: 7 Hours</b>	<b>TQT: 10 Hours</b>
<p><b>Overview:</b> This unit will provide the learner with the knowledge which learner riders will need to know before they begin to ride a motorcycle on a public highway. This includes applying for their first driving licence, becoming familiar with the Highway Code, arranging riding lessons and booking the riding test.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Know the process of applying for their first driving licence	1.1 State the name given to a 'first' driving license 1.2 Identify an organisation that deals with driving license applications 1.3 Identified the age of which a person can apply for their first driving license 1.4 List reasons why a person may be refused a first license
2. Know the purpose of the Highway Code	2.1 Outline the purpose of the Highway Code 2.2 Give examples of the content in the Highway Code 2.3 List various formats of the Highway Code
3. Know the meaning of a sample of road safety signs	3.1 State the meaning of a sample of common road signs
4. Know how to identify an approved training body school and instructors	4.1 Give examples of things to consider when choosing an approved training body school and instructor 4.2 State who to contact regarding poor service or behaviour from: a. An approved training body school b. Riding instructor
5. Know the content of both the theory and practical riding tests	5.1 Use simple research methods to identify the content and timescale of the: a. Riding theory test b. Practical riding test 5.2 Locate an approved training body test centre 5.3 List different methods of booking a riding test 5.4 State what documents must be produced at the riding test 5.5 Identify motorcycle problems and faults that may prevent it being used for the riding test



The content below is a guide, therefore, the latest driving standards must be consulted to ensure the information delivered to the learners is accurate and up to date.

Unit Content	Assessment Criteria
<p><b>Applying for your first driving licence to include:</b></p> <ul style="list-style-type: none"> <li>• how to apply – various stages / process</li> <li>• provisional licence – restrictions, use of red L plates, no carrying of unqualified passengers and motorways etc.</li> <li>• requirements to qualify for a provisional licence – reasons for being prevented from riding</li> <li>• where to apply for a provisional licence</li> <li>• methods of application – post, online etc.</li> <li>• when / age to apply</li> </ul>	1.1-1.4
<p><b>Recognise the Highway Code and its content to include:</b></p> <ul style="list-style-type: none"> <li>• why it is essential – help reduce road casualties</li> <li>• who it applies to - road users and pedestrians</li> <li>• legal implications in the Highway Code – may be prosecuted if disobeyed and used in evidence</li> <li>• content – information for road users, pedestrians, and road signs</li> <li>• formats: audiobook, app, paperback book, etc.</li> </ul>	2.1- 3.1
<p><b>Know a range of road signs to include:</b></p> <ul style="list-style-type: none"> <li>• shapes</li> <li>• colours</li> <li>• meanings</li> <li>• mandatory</li> <li>• warning</li> <li>• regulatory</li> <li>• speed limits</li> </ul>	3.1
<p><b>Riding lessons and learning to ride to include:</b></p> <ul style="list-style-type: none"> <li>• legal safety equipment for riding a motorcycle, crash helmet, visors and goggle safety standards approval</li> <li>• suggested PPE for riding a motorcycle</li> <li>• Compulsory Basic Training (CBT) , valid duration of CBT</li> <li>• CBT limits of engine capacity and power output restrictions (DL196)</li> <li>• driver and Vehicle Standards Agency</li> <li>• L plates rules – colour and positioning</li> <li>• finding riding lessons and instructors – display badges, pricing, offers, reputation and courses.</li> <li>• complaints about an approved instructor - Trading Standards Office and Citizens Advice Bureau (for poor service) Driver and Vehicle Standards Agency (for unacceptable behaviour and illegal instructors)</li> <li>• rules for practising with family and friends - see current rules for supervising learner riders</li> </ul>	4.1, 4.2
<p><b>The riding test to include:</b>  <b>The theory test:</b></p> <ul style="list-style-type: none"> <li>• how to book a riding test – indicate any additional needs or requirements prior to the test, for example dyslexia.</li> <li>• content of the test – timescale, format and practise material</li> <li>• how to locate a theory test centre – research methods, Government websites</li> </ul> <p><b>The riding test:</b></p> <ul style="list-style-type: none"> <li>• booking the test – highlight any additional needs or requirements before the test</li> <li>• purpose of the test – ride safely in different road and traffic conditions, know the Highway Code and meet the standard required.</li> <li>• documents to take to the test – theory test certificate and driving licence</li> <li>• what happens during the test – timescale, manoeuvres, types of instruction, routes and know current riding standards</li> <li>• motorcycle rules and suitability if used during a riding test – correct documentation, meet the required speed limits, correctly fitted L plates, no warning lights permanently illuminated - check current requirements</li> </ul>	5.1- 5.5



<b>UNIT REF: L1MV08</b>	<b>UNIT TITLE: REDUCING RISKS WHEN DRIVING VEHICLES</b>
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<b>Level: 1</b>	<b>GL: 14 Hours</b>	<b>TQT: 17 Hours</b>
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**Overview:** This unit is aimed at pre-learner drivers and novice drivers. The unit content will provide the learner with the knowledge and skills, which will aid in them in reducing risks by preparing the vehicle and taking responsibility for their behaviour when planning to learn to drive and driving vehicles.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know different types of vehicle pre-use checks	1.1 Identify pre-use vehicle checks
	1.2 State the different types of fluid and coolant level checks
2 Know the consequences of failing to carryout pre-use vehicle checks	2.1 Give examples of the consequences of failing to carry out pre-use vehicle checks
3 Know the how to reduce risks when driving vehicles	3.1 Outline how to reduce risks when driving vehicles
4 Be able carryout pre-use vehicle checks	4.1 Demonstrate how to carry out pre-use vehicle checks
5 Be able to check and adjust vehicle fluid and coolant levels	5.1 Demonstrate how to check and adjust vehicle fluid and coolant levels

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing the task listed below on <b>at least one</b> occasion:
Carrying out vehicle pre-use checks and reporting any faults
Checking and adjusting the vehicle fluid and coolant levels



Unit Content	Assessment Criteria
<p><b>Daily pre-use vehicle checks to include checking the vehicle:</b></p> <ul style="list-style-type: none"> <li>• is checked in one direction</li> <li>• is sitting square and not leaning</li> <li>• for leaks</li> <li>• panels and trims are secure</li> <li>• exhaust is secure and no excessive noise and smoke</li> <li>• number plates</li> <li>• fuel cap</li> <li>• wiper blades</li> <li>• vehicle loads and loading</li> <li>• restraint systems</li> <li>• lights, indicators, hazard lights and reflectors</li> <li>• windows and mirrors</li> <li>• tyres</li> <li>• fluids</li> <li>• access - doors and locks</li> <li>• instruments, dashboard warning lights and controls</li> <li>• interior - controls, obstructions or loose items</li> <li>• tools, spare wheel and high-visibility vest</li> <li>• breakdown services information</li> </ul> <p><b>Different types of fluid and coolant level checks which are required:</b></p> <ul style="list-style-type: none"> <li>• power steering</li> <li>• windscreen washers and screen wash</li> <li>• cooling system</li> <li>• engine oil</li> </ul>	<p>1.1 -1.2</p>
<p><b>Examples of the consequences of failing to carryout vehicle pre-use checks will include:</b></p> <ul style="list-style-type: none"> <li>• component failure</li> <li>• vehicle breakdowns</li> <li>• poor vision</li> <li>• accidents / collisions</li> <li>• fines and convictions</li> <li>• fatality</li> <li>• leaks</li> <li>• unpredictable vehicle handling</li> <li>• be unnoticed by other road users and pedestrians</li> <li>• being stranded with no breakdown cover and a spare wheel</li> <li>• impact from insecure objects within the vehicle interior</li> </ul>	<p>2.1</p>
<p><b>How to reduce risks when driving vehicles to include:</b></p> <ul style="list-style-type: none"> <li>• maintain a calm and appropriate attitude</li> <li>• do not let peer pressure affect driving style</li> <li>• recognising a lack of experience and driving limitations</li> <li>• do not drive after consuming alcohol or drugs</li> <li>• check if any prescribed medication is permitted while driving</li> <li>• avoid distractions such as: mobile phones, loud audio, constant communication with passengers, eating and drinking</li> <li>• overloading with passengers, weight and luggage</li> <li>• taking further training</li> <li>• driving within legal limits</li> <li>• building confidence and anticipation skills when driving in the dark, negotiating bends and overtaking</li> <li>• how to ensure the car is in a safe condition.</li> <li>• learning how to carry out vehicle checks.</li> <li>• planning routes in advance</li> <li>• start with short and less demanding drives</li> <li>• rest when tired to prevent losing concentration</li> <li>• adjust all vehicle mirrors</li> </ul>	<p>3.1</p>



<b>UNIT REF: L1MV09</b>	<b>UNIT TITLE: INTRODUCTION TO MOBILE AUTOMOTIVE REPAIR TRADES</b>
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<b>Level: 1</b>	<b>GL: 10 Hours</b>	<b>TQT: 11 Hours</b>
<b>Overview:</b> This unit will provide the learner with the knowledge of different types of mobile vehicle repair services and their role within the automotive industry.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know a range of automotive trades which carry out mobile repairs	1.1 Identify a range of automotive trades which carry out mobile repairs  1.2 Give examples of the services which each of the trades provide
2 Know the benefits of mobile repair trades	2.1 State the advantages of mobile repair services
3 Know the limitations of mobile repair trades	3.1 Outline instances where a mobile repair service may not be recommended

<b>Unit Content</b>	<b>Assessment Criteria</b>
<p><b>Automotive trades which provide mobile repairs include:</b></p> <ul style="list-style-type: none"> <li>• tyre fitters</li> <li>• paintless dent removal</li> <li>• accident repair services (body and paint)</li> <li>• mechanical, electrical and trim</li> <li>• valeting, detailing and vehicle interior repairs</li> <li>• autoglazing</li> <li>• breakdown services and recovery services / mechanical work</li> </ul> <p><b>Examples of the services which each trade provides:</b></p> <ul style="list-style-type: none"> <li>• tyre fitters - repair punctures, wheel balancing, remove and replace vehicle tyres.</li> <li>• paintless dent removal - repair panel minor damage without damaging the paint.</li> <li>• accident repair services (body and paint) - remove and refit body panels, repair panel damage and refinish vehicle panels.</li> <li>• MET - removal and replacement of mechanical, electrical and trim components.</li> <li>• valeting, detailing and vehicle interior repairs - clean and enhance the interior and exterior of vehicle surfaces, repair and refinish minor damage to interior upholstery, carpets and trims.</li> <li>• autoglazing - repair vehicle glass, remove and replace vehicle glass and calibrate advanced driver assistance systems.</li> <li>• breakdown services and recovery services / mechanical work - carry out mechanical repairs, tow and recover vehicles from the roadside.</li> </ul>	1.1-1.2
<p><b>State the advantages of mobile repair services</b></p> <ul style="list-style-type: none"> <li>• the customer can see the repair taking place</li> <li>• the customer can communicate directly with the Technician</li> <li>• the repair is carried out at a place convenient to the customer</li> <li>• save the customer time and effort</li> </ul>	2.1
<p><b>Instances where a mobile repair service may not be recommended</b></p> <ul style="list-style-type: none"> <li>• size and extent of the repair</li> <li>• the working environment</li> <li>• working space / area</li> <li>• legal implications</li> <li>• power sources</li> <li>• equipment</li> <li>• timescales</li> <li>• types of products used</li> <li>• vehicle construction materials</li> <li>• specialist vehicles</li> </ul>	3.1



<b>UNIT REF: L1MV10</b>	<b>UNIT TITLE: INTRODUCTION TO BUSINESS ENTERPRISE</b>
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<b>Level: 1</b>	<b>GL: 12 Hours</b>	<b>TQT: 22 Hours</b>
<b>Overview:</b> This unit will provide learners with the knowledge and skills required to develop business and enterprise ideas.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know the behavioural characteristics and qualities that define an entrepreneur	1.1 Outline the common qualities associated with an entrepreneur  1.2 Outline the common behaviours associated with being an entrepreneur
2 Know how to recognise and resource a business idea	2.1 Give examples of business opportunities  2.2 List the types of resources required to develop a business opportunity  2.3 List the advantages of completing a project plan  2.4 List the types of costs associated with a project
3 Be able to develop a project or business idea	3.1 Discuss and agree a business service or product to develop  3.2 Develop the business idea into a simple project plan  3.3 Discuss the costs and resources associated with the project plan  3.4 Develop the agreed business service or product

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below:
Discussing and agreeing a product or service with possible costs
Developing a simple project plan
Developing a service or product



Unit Content	Assessment Criteria
<p><b>Qualities include:</b></p> <ul style="list-style-type: none"> <li>• Business focused</li> <li>• Confident</li> <li>• Creative thinking</li> <li>• Delegation skills</li> <li>• Determination</li> <li>• Independent</li> <li>• Risk taker</li> </ul> <p><b>Behaviours include:</b></p> <ul style="list-style-type: none"> <li>• Positive attitude</li> <li>• Purpose driven</li> <li>• Influencer</li> <li>• Planner</li> <li>• Evaluator</li> <li>• Leader</li> <li>• Objectiveness</li> <li>• Calculating</li> <li>• Self-imposed standards</li> <li>• Enthusiastic</li> </ul>	<p>1.1, 1.2</p>
<p><b>Identifying business demand and opportunities from, to include:</b></p> <ul style="list-style-type: none"> <li>• Local and National newspapers</li> <li>• Radio</li> <li>• TV</li> <li>• Internet and social media</li> <li>• Market research</li> <li>• Friends and family</li> <li>• Post office and newsagents</li> <li>• Tendering</li> <li>• Local and regional maps</li> <li>• Scanning economic and social scenes</li> </ul> <p><b>Resources required to develop a business include:</b></p> <ul style="list-style-type: none"> <li>• human</li> <li>• finances</li> <li>• environment</li> <li>• tools and equipment</li> <li>• results of market research</li> </ul> <p><b>Advantages of project plans to include estimates of:</b></p> <ul style="list-style-type: none"> <li>• business demand</li> <li>• income</li> <li>• expenditure</li> <li>• profit</li> <li>• time frames for individual elements of plan</li> <li>• staffing needs</li> <li>• workplace needs</li> <li>• training needs of staff</li> <li>• tracking progress</li> </ul> <p><b>Costs associated with a project to include:</b></p> <ul style="list-style-type: none"> <li>• income</li> <li>• expenditure</li> <li>• profit</li> <li>• marketing</li> <li>• staffing needs</li> <li>• workplace needs</li> </ul>	<p>2.1, 2.2, 2.3, 2.4</p>

**Guidance To Assessors:**

Due to the diverse nature of individual projects completed by learners undertaking this unit, the assessor is required to develop the assessment documentation materials to meet with the Assessment Criteria.

**Examples Of Projects That May Be Undertaken To Meet With The Assessment Criteria, Learners Produce Plans To Carry Out:**

- Winter vehicle inspection in a workshop environment.
- Pre-holiday vehicle inspection in a workshop
- Vehicle exterior / interior valet
- Minor vehicle service
- Paint defect repair
- Supplying vehicle spare parts

**Scenario:**

Learners work individually or in small groups to identify and agree the activity. Learners discuss and develop plans of the individuals responsibility completing the project including; resources, tools, equipment and materials required to provide the service or product.

Learners produce marketing materials with services or products offered and contact details which are then placed in prominent places to advertise their services or products.

Learners deal with customer enquiries efficiently and effectively, recording the services or products required accurately by the customer.

Learners deal with the customer professionally when the service or product, confirming services or products required and personal contact details. **(vehicle is checked by both learner and customer regarding a pre-work inspection).**

Learners complete the services or provide the products and appropriate documentation as per customer directions to a good standard of work.

Learners are polite and courteous when the customer is provided with the service or product, **(a post work check is carried out by both parties, and any queries are dealt with effectively).**

**A Selection Of The Following Assessment Types May Be Used To Meet The Evidence Requirement's:**

- Direct assessor observations
- Products of work completed by the learner: job cards, inspection check lists
- Professional discussions with assessor / customer
- Knowledge questions produced by the assessor
- Group work activity reports completed by learners
- Witness testimonies completed by customers

**Please Note:**

The assessor will need to ensure the evidence provided in the learner's portfolio for this unit meets all of the Assessment Criteria, the evidence must be cross referenced to the Assessment Criteria.

AC	Guidance	Examples of Evidence Generated
3.1	Learner makes a questionnaire to gauge interest in the service activity, includes: type of service required, price prepared to pay, day and time they would like the service, the type of service required.	<ul style="list-style-type: none"> <li>• Completed questionnaires.</li> </ul>
3.2	Learner develops the business solution in response to the questionnaire, service required, potential: volumes of potential customers, day and time to provide the service, income expected, costs per service incurred, profit from the activities. Learner develops the marketing materials and promotes the service activities to the potential audience. Materials include contact details of how to make an appointment.	<ul style="list-style-type: none"> <li>• Learners analysis of results of the questionnaire</li> <li>• Leaflet the learner has produced</li> </ul>
3.3	The learners plans highlight the services required, the number of customers requiring the service, associated costs and resources needed to plan for the demand	<ul style="list-style-type: none"> <li>• Learner calculates the basic forecasted income, expenditure and profit; and the resources from the enquiries resulting from the marketing activity</li> </ul>
3.4	The learner develops the agreed business service or product, liaises with the relevant assessor to discuss AC3.2, once the plans are agreed the learner confirms the resources required and contacts the customers to confirm the service or product required. Learner completes the service activity / provides the product. On completion of the activities, the learner analyses the results of the activity and produces a basic report.	<ul style="list-style-type: none"> <li>• Copies of the workshop booking system.</li> <li>• Lists of products supplied</li> <li>• Pre and Post vehicle inspections.</li> <li>• Assessor observation report</li> <li>• Learner analysis of the tasks completed.</li> <li>• Witness testimony from the customer</li> </ul>





<b>UNIT REF: L1MV11</b>	<b>UNIT TITLE: HEALTH AND SAFETY PRACTICES IN A MAINTENANCE AND REPAIR ENVIRONMENT</b>
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<b>Level: 1</b>	<b>GL: 14 Hours</b>	<b>TQT: 20 Hours</b>
<p><b>Overview:</b> This unit further develops the learner's awareness of Health and Safety in the workplace by putting into practice the knowledge gained from unit L1MV01. Learners will further develop the knowledge in identifying hazards and risks, and be able to: demonstrate safe working practices using a variety of tools, equipment and consumable materials whilst carrying out routine maintenance and simple repair tasks in an automotive maintenance and repair environment.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know the hazards and risks associated with working in the automotive environment.	1.1 List the typical hazards and risks associated with: a. carrying out vehicle repairs and maintenance. b. using cleaners and lubricants  1.2 Identify where to find the health and safety information relating to cleaning and lubrication products  1.3 State good housekeeping routines associated with outline vehicle maintenance and simple repair activities
2 Know how to work safely in the automotive environment.	2.1 Identify the PPE and VPE used in the maintenance and repair of vehicles  2.2 Identify the safe working practices to be used when carrying out routine vehicle maintenance and simple repairs task
3 Be able to use appropriate health and safety practices	3.1 Use appropriate safe and healthy working practices when working in the automotive maintenance and repair environment  3.2 Demonstrate good housekeeping practices when working in the automotive maintenance and repair environment.
4 Be able to use appropriate equipment and materials in line with health and safety guidelines.	4.1 Use automotive tools and equipment in line with health and safety practices and manufactures instructions  4.2 Use appropriate automotive maintenance and repair materials following relevant health and safety guidelines and manufactures instructions.
5 Be able to work safely when carrying out maintenance and simple repair tasks.	5.1 Use appropriate PPE and VPE when carrying out routine vehicle maintenance and simple repair tasks  5.2 Use appropriate and safe working practices when carrying out routine vehicle maintenance and simple repairs.



Evidence Requirements
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion: (Note: evidence for this unit can be referenced to other appropriate units within the qualification)
Using safe and healthy working practices when working in the automotive environment.
Demonstrating good housekeeping practices when working in the automotive environment.
Using automotive tools and equipment in line with health and safety practices and manufactures instructions.
Using appropriate automotive maintenance and repair materials following relevant health and safety guidelines and manufactures instructions.
Using appropriate PPE and VPE when carrying out routine vehicle maintenance and simple repair tasks
Using appropriate and safe working practices when carrying out routine vehicle maintenance and simple repairs

Unit Content	Assessment Criteria
<p><b>Common hazards and risks associated with automotive and maintenance and repairs include:</b></p> <ul style="list-style-type: none"> <li>• slip and trip hazards, hazardous substances, electric shock, explosion of tyres, poor ventilation, battery charging, falling objects, movement of heavy loads</li> </ul> <p><b>Common hazards and risks associated with cleaners and lubricants to include:</b></p> <ul style="list-style-type: none"> <li>• flammable liquids, skin irritation, chemical burns, swallowing fluids, fluid in eyes, fire hazards</li> </ul> <p><b>Know where to find Health and Safety information to include:</b></p> <ul style="list-style-type: none"> <li>• on packaging of chemicals</li> <li>• manufactures websites</li> <li>• notices issued by local authority's</li> <li>• health and Safety Executive Web site (HSE)</li> <li>• risk assessments</li> </ul> <p><b>Good housekeeping practices to include:</b></p> <ul style="list-style-type: none"> <li>• keeping work area clean of debris</li> <li>• floors cleaned</li> <li>• chemicals stored correctly</li> <li>• bins emptied</li> <li>• correct disposal of waste material</li> <li>• prompt disposal and storage of waste materials</li> <li>• prompt cleaning of spillages</li> <li>• regular cleaning of work area</li> <li>• storage of tools and equipment</li> <li>• correct storage of flammable liquids</li> </ul>	



Unit Content	Assessment Criteria
<p><b>PPE and VPE for the automotive environment include:</b></p> <ul style="list-style-type: none"><li>• overalls</li><li>• safety boots</li><li>• skin protection</li><li>• eye protection</li><li>• ear protection</li><li>• dust mask</li><li>• seat covers</li><li>• steering wheel protectors</li><li>• wing covers</li><li>• floor mats</li></ul> <p><b>Health and safety practices to include:</b></p> <ul style="list-style-type: none"><li>• use of PPE and VPE</li><li>• use of stands and supporting aids</li><li>• location of fire extinguishers</li><li>• following safety instructions</li><li>• correct use of tools and equipment</li></ul> <p><b>Checking appropriate tools and equipment to include:</b></p> <ul style="list-style-type: none"><li>• electrical equipment – blown fuses, damaged cables</li><li>• identifying unsafe hand tools - damaged hand tools</li><li>• identifying unsafe equipment – broken / missing components</li></ul>	2.1, 2.2



<b>UNIT REF: L1MV12</b>	<b>UNIT TITLE: TOOLS, EQUIPMENT AND CONSUMABLE MATERIALS FOR VEHICLE MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT: 21 Hours</b>
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**Overview:** This unit will provide learners with the knowledge and skills to be able to select, check and use tools and equipment used for vehicle maintenance and repairs, the unit also covers the appropriate selection and use of consumable materials used during maintenance and repair activities

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know a range of tools and equipment used in vehicle maintenance and repair.	1.1 Identify a range of vehicle maintenance and repair tools and equipment.  1.2 Outline how to check vehicle tools and equipment prior to use.  1.3 State how to use vehicle tools and equipment correctly.
2 Know a range of consumable materials used in vehicle maintenance and repair.	2.1. Identify consumable materials used in vehicle maintenance and repair.  2.2 Locate information relating consumable materials used in maintenance and repair.  2.3 State how to use consumable materials used in vehicle maintenance and repairs.
3 Be able to select, check and use tools and equipment used in vehicle maintenance and repairs.	3.1 Demonstrate how to select and check vehicle maintenance and repair tools and equipment.  3.2 Demonstrate how to use vehicle maintenance and repair tools and equipment safely.
4 Be able to select and use consumable materials used in vehicle maintenance and repairs.	4.1 Select and use consumable materials to maintain and repair vehicles.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion: (Note: the tasks can be referenced to other appropriate units within the qualification)
Selecting and checking vehicle maintenance and repair tools and equipment.
Using vehicle maintenance and repair tools and equipment safely.
Selecting and using consumable materials used in vehicle maintenance and repair.



Unit Content	Assessment Criteria
<p><b>Hand tools for vehicle maintenance and repair to include:</b></p> <ul style="list-style-type: none"><li>spanners – open end, ring, combination, speed and ratchet types)</li><li>screwdrivers – flat blade, Phillips, pozidrive</li><li>hammers – ball pein, lump, copper/hide, rubber, neoprene</li><li>chisels</li><li>saws – hacksaw, junior hacksaw</li><li>steel rule and tape measure</li><li>allen keys</li><li>vice grips</li><li>socket sets – different drive sizes, specialist socket and screw bits, stud remover adaptor</li><li>pliers and grips – long nose, engineers, side snips/cutters, pipe grips, mole grips</li><li>torque wrench</li><li>feeler blades</li><li>tyre tread depth gauges</li></ul> <p><b>Equipment to include:</b></p> <ul style="list-style-type: none"><li>lifting equipment – jacks, ramps, lifts, axle stands</li><li>air tools – air lines, tyre inflator/gauge, wrenches, hammers, blow guns</li><li>bench tools – grindstone, pillar drill</li><li>portable electric tools – hand drills, extension leads, component cleaners</li><li>specialist tools – tracking gauges, filter removal straps, waste oil drainers, exhaust extraction</li><li>select appropriate and necessary equipment for task</li></ul> <p><b>Outline the type of checks which are carried on tools and equipment prior to use to include:</b></p> <ul style="list-style-type: none"><li>secure and on even ground</li><li>leaks</li><li>damage to pipes, cables or connections</li><li>evidence of damage or abuse</li><li>the equipment is appropriate for the task</li><li>certification / 'tested' stickers are visible</li><li>guards are in place</li><li>service records are up to date</li><li>stop / emergency cut off buttons or devices are working and within the operators reach</li><li>tools are lubricated where necessary</li></ul> <p><b>Using tools and equipment to include:</b></p> <ul style="list-style-type: none"><li>using manufacturer's instructions</li><li>safe working procedures</li><li>safe working limits</li><li>specialist training requirements</li><li>legal requirements</li><li>reporting of defects</li><li>adjust settings</li><li>set pressure</li><li>zero readings</li><li>examine for defects</li><li>locate correctly – axle stands and jacks</li><li>use when appropriate – exhaust extraction when engine is running</li></ul>	1.1, 1.2, 1.3



Unit Content	Assessment Criteria
<p><b>Identify a range of consumable materials used in vehicle maintenance and repair to include:</b></p> <ul style="list-style-type: none"><li>• lubricants</li><li>• coolants</li><li>• fluids</li><li>• adhesives and cements</li><li>• sealers</li><li>• filters</li><li>• aerosol sprays</li><li>• gaskets</li><li>• cleaners</li></ul> <p><b>Locating information relating to consumable materials used in vehicle maintenance and repairs include:</b></p> <ul style="list-style-type: none"><li>• product manufacturers websites</li><li>• manufacturers' representatives</li><li>• manufacturers' online training videos</li><li>• technical helplines</li><li>• promotional brochures</li><li>• product catalogues</li><li>• trade shows</li><li>• product demonstrations</li></ul> <p><b>Using consumable materials used in vehicle maintenance and repairs to include:</b></p> <ul style="list-style-type: none"><li>• access and use of product safety information</li><li>• the purpose and limitations of the materials and consumables</li><li>• how to prepare the materials and consumables</li><li>• the safe use of the materials and consumables</li><li>• tools and techniques for safe use</li><li>• the clean-up processes</li><li>• waste disposal procedures</li></ul>	2.1, 2.2, 2.3



<b>UNIT REF: L1MV15</b>	<b>UNIT TITLE: HEALTH AND SAFETY PRACTICES IN A VALETING AND DETAILING ENVIRONMENT</b>
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<b>Level: 1</b>	<b>GL: 13 Hours</b>	<b>TQT: 18 Hours</b>
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**Overview:** This unit further develops the learner’s awareness of Health and Safety in the workplace by putting into practice the knowledge gained from unit L1MV01. Learners will further develop the knowledge in identifying hazards and risks, and be able to: demonstrate safe working practices using a variety of tools, equipment and consumable materials whilst carrying out vehicle valeting and detailing tasks.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know the hazards and risks associated with working in a valeting and detailing environment.	1.1 List the typical hazards and risks associated with: a. vehicle valeting and detailing b. using cleaning materials  1.2 Identify where to find the health and safety information relating to cleaning products  1.3 State good housekeeping routines associated with vehicle valeting and detailing tasks
2 Know how to work safely in the valeting and detailing environment	2.1 Identify the PPE and VPE used in the valeting and detailing environment  2.2 Identify the safe working practices to be used when carrying out valeting and detailing.
3 Be able to use appropriate health and safety practices	3.1 Use appropriate safe and healthy working practices when carrying out vehicle valeting and detailing.  3.2 Demonstrate good housekeeping practices when working in valeting and detailing environment
4 Be able to use appropriate equipment and consumable materials in line with health and safety guidelines	4.1 Use vehicle valeting equipment in line with health and safety practices and manufactures instructions  4.2 Use valeting and detailing materials following relevant health and safety guidelines and manufactures instructions
5 Be able to work safely when carrying out vehicle valeting and detailing tasks.	5.1 Use appropriate PPE and VPE when carrying out vehicle valeting and detailing tasks  5.2 Use appropriate and safe working practices when carrying out vehicle valeting and detailing tasks.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion: (Note: evidence for this unit can be referenced to other appropriate units within the qualification)
Using safe and healthy working practices when carrying out vehicle valeting and detailing tasks.
Demonstrating good housekeeping practices when carrying out vehicle valeting and detailing tasks.
Using valeting tools and equipment in line with health and safety practices and manufactures instructions.
Using appropriate valeting materials following relevant health and safety guidelines and manufactures instructions.
Using appropriate PPE and VPE when carrying out vehicle valeting and detailing tasks.
Using appropriate and safe working practices when carrying out vehicle valeting and detailing tasks.



Unit Content	Assessment Criteria
<p><b>Common hazards and risks associated with vehicle valeting and detailing tasks, include:</b></p> <ul style="list-style-type: none"> <li>• slip and trip hazards, hazardous substances, electric shock, poor ventilation, battery charging, falling objects, movement of heavy loads</li> </ul> <p><b>Common hazards and risks associated with cleaners to include:</b></p> <ul style="list-style-type: none"> <li>• flammable liquids, skin irritation, chemical burns, swallowing fluids, fluid in eyes, fire hazards</li> </ul> <p><b>Know where to find Health and Safety information to include:</b></p> <ul style="list-style-type: none"> <li>• on packaging of chemicals</li> <li>• manufactures websites</li> <li>• notices issued by local authority's</li> <li>• Health and Safety Executive Web site (HSE)</li> <li>• risk assessments</li> </ul> <p><b>Good housekeeping practices to include:</b></p> <ul style="list-style-type: none"> <li>• keeping work area clean of debris</li> <li>• floors cleaned</li> <li>• chemicals stored correctly</li> <li>• bins emptied</li> <li>• correct disposal of waste material</li> <li>• prompt disposal and storage of waste materials</li> <li>• prompt cleaning of spillages</li> <li>• regular cleaning of work area</li> <li>• storage of tools and equipment</li> <li>• correct storage of flammable liquids</li> </ul>	<p>1.1, 1.2, 1.3</p>
<p><b>PPE and VPE for the valeting and detailing environment include:</b></p> <ul style="list-style-type: none"> <li>• overalls</li> <li>• safety boots</li> <li>• skin protection</li> <li>• eye protection</li> <li>• ear protection</li> <li>• dust masks</li> <li>• steering wheel covers</li> <li>• floor mats</li> <li>• seat covers</li> </ul> <p><b>Health and safety practices to include:</b></p> <ul style="list-style-type: none"> <li>• use of PPE and VPE</li> <li>• location of fire extinguishers</li> <li>• following safety instructions</li> <li>• correct use of tools and equipment</li> </ul> <p><b>Checking appropriate tools and equipment to include:</b></p> <ul style="list-style-type: none"> <li>• electrical equipment – blown fuses, damaged cables</li> <li>• identifying unsafe hand tools - damaged hand tools</li> <li>• identifying unsafe equipment – broken / missing components</li> </ul>	<p>2.1, 2.2</p>





<b>UNIT REF: L1MV16</b>	<b>UNIT TITLE: TOOLS, EQUIPMENT AND CONSUMABLE MATERIALS USED FOR VALETING AND DETAILING</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT: 21 Hours</b>
<p><b>Overview:</b> This unit will provide learners with the knowledge and skills to be able to select, check and use tools and equipment used for valeting and detailing, the unit also covers the appropriate selection and use of consumable materials used valeting and detailing activities.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know a range of tools and equipment used in valeting and detailing	1.1 Identify a range of valeting and detailing tools and equipment  1.2 Outline how to check valeting and detailing tools and equipment prior to use  1.3 State how to use valeting and detailing tools and equipment correctly
2 Know a range of consumable materials used in valeting and detailing	2.1 Identify consumable materials used in valeting and detailing  2.2 Locate information relating consumable materials used in valeting and detailing  2.3 State how to use consumable materials used in valeting and detailing
3 Be able to select, check and use tools and equipment used in valeting and detailing	3.1 Demonstrate how to select and check valeting and detailing tools and equipment prior to use  3.2 Demonstrate how to use valeting and detailing tools and equipment safely
4 Be able to select and use consumable materials used in valeting and detailing	4.1 Select and use consumable materials to valet and detail vehicles

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion: (Note: the tasks can be referenced to other appropriate units within the qualification)
Selecting and checking valeting and detailing tools and equipment prior to use.
Using valeting and detailing tools and equipment safely.
Selecting and using consumable materials used in valeting and detailing.



Unit Content	Assessment Criteria
<p><b>Tools and equipment for valeting and detailing include:</b></p> <ul style="list-style-type: none"> <li>• water hose (mains pressure)</li> <li>• cleaning brushes for paintwork</li> <li>• wheel brushes or scrubbers</li> <li>• sponges and buckets</li> <li>• chamois leather</li> <li>• polishing cloth</li> <li>• pressure washer</li> <li>• air lines and tools – blow guns</li> <li>• portable electric tools – vacuum cleaners, machine polishers, extension leads, component cleaner</li> <li>• select appropriate and necessary equipment for task</li> <li>• steps and ladders</li> </ul> <p><b>Outline the type of checks which are carried on tools and equipment prior to use to include:</b></p> <ul style="list-style-type: none"> <li>• secure and on even ground</li> <li>• leaks</li> <li>• damage to pipes, cables or connections</li> <li>• evidence of damage or abuse</li> <li>• the equipment is appropriate for the task</li> <li>• certification / 'tested' stickers are visible</li> <li>• guards are in place</li> <li>• service records are up to date</li> <li>• stop / emergency cut off buttons or devices are working and within the operators reach</li> </ul> <p><b>Using tools and equipment to include:</b></p> <ul style="list-style-type: none"> <li>• using manufacturer's instructions</li> <li>• safe working procedures</li> <li>• safe working limits</li> <li>• specialist training requirements</li> <li>• legal requirements</li> <li>• reporting of defects</li> </ul>	<p>1.1, 1.2, 1.3</p>
<p><b>Identify a range of consumable materials used in valeting and detailing to include:</b></p> <ul style="list-style-type: none"> <li>• shampoo</li> <li>• polish</li> <li>• tyre blackener</li> <li>• glass cleaner</li> <li>• tar remover</li> <li>• chrome cleaner</li> <li>• alloy wheel cleaner</li> <li>• upholstery cleaner</li> <li>• shampoo</li> <li>• glass cleaner</li> <li>• dashboard cleaner</li> <li>• carpet shampoo</li> </ul> <p><b>Locating information relating to consumable materials used in valeting and detailing include:</b></p> <ul style="list-style-type: none"> <li>• product manufacturers websites</li> <li>• manufacturers' representatives</li> <li>• manufacturers' online training videos</li> <li>• technical helplines</li> <li>• promotional brochures</li> <li>• product catalogues</li> <li>• trade shows</li> <li>• product demonstrations</li> </ul> <p><b>Using consumable materials used in valeting and detailing to include:</b></p> <ul style="list-style-type: none"> <li>• access and use of product safety information</li> <li>• the purpose and limitations of the materials and consumables</li> <li>• how to prepare the materials and consumables</li> <li>• the safe use of the materials and consumables</li> <li>• tools and techniques for safe use</li> <li>• the clean-up processes</li> <li>• waste disposal procedures</li> </ul>	<p>2.1, 2.2, 2.3</p>



<b>UNIT REF: L1MV17</b>	<b>UNIT TITLE: HEALTH AND SAFETY PRACTICES IN A CYCLE REPAIR ENVIRONMENT</b>
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<b>Level: 1</b>	<b>GL: 13 Hours</b>	<b>TQT: 18 Hours</b>
<p><b>Overview:</b> This unit further develops the learner's awareness of Health and Safety in the workplace by putting into practice the knowledge gained from unit L1MV01. Learners will further develop the knowledge in identifying hazards and risks, and be able to: demonstrate safe working practices using a variety of tools, equipment and consumable materials whilst carrying out routine maintenance and simple repair tasks in a cycle environment.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know the hazards and risks associated with working in the cycle environment	1.1 List the typical hazards and risks associated with: <ul style="list-style-type: none"> <li>a. carrying out routine maintenance and simple repairs.</li> <li>b. using cleaners and lubricants</li> </ul> 1.2 Identify where to find the health and safety information relating to cleaning and lubrication products           1.3 State good housekeeping routines associated with routine maintenance and simple repair activities
2 Know how to work safely in the cycle environment	2.1 Identify the PPE and VPE used in routine maintenance and simple repairs of cycles           2.2 Identify the safe working practices to be used when carrying out routine maintenance and simple cycle repairs.
3 Be able to use appropriate health and safety practices	3.1 Use appropriate safe and healthy working practices when working in the cycle environment           3.2 Demonstrate good housekeeping practices when working in the cycle environment.
4 Be able to use appropriate tools, equipment and consumable materials in line with health and safety guidelines	4.1 Use cycle tools and equipment in line with health and safety practices and manufactures instructions           4.2 Use appropriate cycle consumable materials following relevant health and safety guidelines and manufactures instructions.
5 Be able to work safely when carrying out maintenance and simple repair tasks	5.1 Use appropriate PPE and VPE when carrying out routine maintenance and simple cycle repairs           5.2 Use appropriate and safe working practices when carrying out routine maintenance and simple repairs.



Evidence Requirements
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion: (Note: evidence for this unit can be referenced to other appropriate units within the qualification)
Using safe and healthy working practices when working in the cycle environment.
Demonstrating good housekeeping practices when working in the cycle environment.
Using cycle tools and equipment in line with health and safety practices and manufactures instructions.
Using appropriate cycle consumable materials following relevant health and safety guidelines and manufactures instructions.
Using appropriate PPE when carrying out routine maintenance and simple repairs.
Using appropriate and safe working practices when carrying out routine maintenance and simple repairs

Unit Content	Assessment Criteria
<p><b>Common hazards and risks associated with routine maintenance and simple cycle repairs include:</b></p> <ul style="list-style-type: none"> <li>• slip and trip hazards, hazardous substances, electric shock, explosion of tyres, poor ventilation, battery charging, falling objects, movement of heavy loads, overloading equipment</li> </ul> <p><b>Common hazards and risks associated with cleaners and lubricants to include:</b></p> <ul style="list-style-type: none"> <li>• flammable liquids, skin irritation, chemical burns, swallowing fluids, fluid in eyes, fire hazards</li> </ul> <p><b>Know where to find Health and Safety information to include:</b></p> <ul style="list-style-type: none"> <li>• on packaging of chemicals</li> <li>• manufactures websites</li> <li>• notices issued by local authority's</li> <li>• Health and Safety Executive Web site (HSE)</li> <li>• risk assessments</li> </ul> <p><b>Good housekeeping practices to include:</b></p> <ul style="list-style-type: none"> <li>• keeping work area clean of debris</li> <li>• floors cleaned</li> <li>• chemicals stored correctly</li> <li>• bins emptied</li> <li>• correct disposal of waste material</li> <li>• prompt disposal and storage of waste materials</li> <li>• prompt cleaning of spillages</li> <li>• regular cleaning of work area</li> <li>• storage of tools and equipment</li> <li>• correct storage of flammable liquids</li> </ul>	<p>1.1, 1.2, 1.3</p>



Unit Content	Assessment Criteria
<p><b>Working safely in the cycle environment to include:</b></p> <p><b>PPE:</b></p> <ul style="list-style-type: none"><li>• overalls</li><li>• safety boots</li><li>• skin protection</li><li>• eye protection</li><li>• ear protection</li><li>• dust mask</li></ul> <p><b>Health and safety practices to include:</b></p> <ul style="list-style-type: none"><li>• use of PPE and VPE</li><li>• use of stands and cycle supporting aids</li><li>• location of fire extinguishers</li><li>• following safety instructions</li><li>• correct use of tools and equipment</li></ul> <p><b>Checking appropriate tools and equipment to include:</b></p> <ul style="list-style-type: none"><li>• electrical equipment – blown fuses, damaged cables</li><li>• identifying unsafe hand tools - damaged hand tools</li><li>• identifying unsafe equipment – broken / missing components</li></ul>	2.1, 2.2



UNIT REF: L1MV18	<b>UNIT TITLE: TOOLS, EQUIPMENT AND CONSUMABLE MATERIALS USED FOR CYCLE MAINTENANCE AND REPAIR</b>
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Level: 1	GL:15 Hours	TQT: 20 hours
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**Overview:** This unit will provide learners with the knowledge and skills to be able to select, check and use tools and equipment used for cycle maintenance and repairs, the unit also covers the appropriate selection and use of consumable materials used during maintenance and repair activities.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know a range of tools and equipment used in cycle maintenance and repair.	1.1 Identify a range of cycle maintenance and repair tools and equipment 1.2 Outline how to check cycle tools and equipment prior to use 1.3 State how to use cycle tools and equipment correctly
2 Know a range of consumable materials used in cycle maintenance and repair.	2.1 Identify consumable materials used in cycle maintenance and repair 2.2 Locate product information relating consumable materials used in maintenance and repair. 2.3 State how to use consumable materials used in cycle maintenance and repairs.
3 Be able to select, check and use tools and equipment used in cycle maintenance and repairs.	3.1 Demonstrate how to select and check cycle maintenance and repair tools and equipment. 3.2 Demonstrate how to use cycle maintenance and repair tools and equipment safely.
4 Be able to select and use consumable materials used in cycle maintenance and repairs.	4.1 Select and use consumable materials to maintain and repair cycles.

Evidence Requirements
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion: (Note: the tasks can be referenced to other appropriate units within the qualification)
Selecting and checking cycle maintenance and repair tools and equipment.
Using cycle maintenance and repair tools and equipment safely.
Selecting and using consumable materials used in cycle maintenance and repair.



Unit Content	Assessment Criteria
<p><b>Hand tools for cycle maintenance and repair to include:</b></p> <ul style="list-style-type: none"> <li>• tyre levers</li> <li>• chain splitter</li> <li>• bottom bracket wrench</li> <li>• free wheel remover</li> <li>• cassette lock ring tool</li> <li>• sprocket removal tool</li> <li>• cable oilers</li> <li>• spoke keys</li> <li>• spanners – open end, ring, combination</li> <li>• screwdrivers – flat blade, Phillips, Pozidrive</li> <li>• hammers – ball peen, copper/hide, rubber, neoprene</li> <li>• saws – hacksaw, junior hacksaw</li> <li>• allen keys</li> <li>• pliers and grips – long nose, engineers, side snips/cutters, pipe grips, mole grips</li> <li>• torque wrench</li> <li>• drill</li> </ul> <p><b>Equipment to include:</b></p> <ul style="list-style-type: none"> <li>• lifting equipment – stands</li> <li>• air lines and tools – tyre inflator/gauge, blow guns</li> <li>• bench tools – vices, grindstone, pillar drill</li> <li>• portable electric tools – hand drills, extension leads, component cleaner</li> </ul> <p>select appropriate and necessary equipment for task</p> <p><b>Outline the type of checks which are carried on tools and equipment prior to use to include:</b></p> <ul style="list-style-type: none"> <li>• secure and on even ground</li> <li>• leaks</li> <li>• damage to pipes, cables or connections</li> <li>• evidence of damage or abuse</li> <li>• the equipment is appropriate for the task</li> <li>• certification / 'tested' stickers are visible</li> <li>• guards are in place</li> <li>• service records are up to date</li> <li>• stop / emergency cut off buttons or devices are working and within the operators reach</li> <li>• tools are lubricated where necessary</li> </ul> <p><b>Using tools and equipment to include:</b></p> <ul style="list-style-type: none"> <li>• using manufacturer's instructions</li> <li>• safe working procedures</li> <li>• safe working limits</li> <li>• specialist training requirements</li> <li>• legal requirements</li> <li>• reporting of defects</li> </ul>	<p>1.1, 1.2, 1.3</p>



Unit Content	Assessment Criteria
<p><b>Identify a range of consumable materials used in cycle maintenance and repair to include:</b></p> <ul style="list-style-type: none"><li>• lubricants</li><li>• brake fluids</li><li>• puncture repair kits</li><li>• puncture preventative products</li><li>• cleaning and valeting products</li></ul> <p><b>Locating information relating to consumable materials used in cycle maintenance and repairs include:</b></p> <ul style="list-style-type: none"><li>• product manufacturers websites</li><li>• manufacturers' representatives</li><li>• manufacturers' online training videos</li><li>• technical helplines</li><li>• promotional brochures</li><li>• product catalogues</li><li>• trade shows</li><li>• product demonstrations</li></ul> <p><b>Using consumable materials used in cycle maintenance and repairs to include:</b></p> <ul style="list-style-type: none"><li>• access and use of product safety information</li><li>• the purpose and limitations of the materials and consumables</li><li>• how to prepare the materials and consumables</li><li>• the safe use of the materials and consumables</li><li>• tools and techniques for safe use</li><li>• the clean-up processes</li><li>• waste disposal procedures</li></ul>	2.1, 2.2, 2.3





<b>UNIT REF: L1MV20</b>	<b>UNIT TITLE: COMPRESSION IGNITION ENGINE SYSTEM COMPONENTS AND OPERATION</b>
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<b>Level: 1</b>	<b>GL: 22 Hours</b>	<b>TQT: 30 Hours</b>
<p><b>Overview:</b> This unit introduces learners to Compression Ignition system (CI) engine components and operation. It also covers identifying the main engine components and requires learners to carry out routine engine maintenance procedures.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Know compression ignition engine systems and components	1.1 Identify the main components used in CI engines 1.2 State the purpose and function of the main components used in CI engines 1.3 Outline the purpose of the systems used in CI engines
2. Know how compression ignition engines operate	2.1 State the operating cycles of the 4 stroke CI engine 2.2 Give examples of the valve and injection timing requirements for 4 stroke CI engines 2.3 State how air to fuel ratios differ from SI engines during different situations 2.4 Identify the constituents of CI exhaust gas emissions
3. Be able to remove and refit a compression ignition engine cylinder head	3.1 Work safely on CI engine systems 3.2 Select and use the correct technical data, tools and equipment for routine maintenance of CI engines 3.3 Demonstrate the correct procedures when removing and refitting an CI engine cylinder head
4. Be able to clean the work area and leave in a safe condition	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition

<b>Evidence Requirements</b>
<b>You must be observed by your assessor carrying out the task below on at least one occasion:</b>
Remove and refit a compression ignition cylinder head (non-running stand engine)



Unit Content	Assessment Criteria
<p><b>The main engine components to include:</b></p> <ul style="list-style-type: none"> <li>• cylinder block</li> <li>• cylinder head</li> <li>• engine sump</li> <li>• crankshaft</li> <li>• connecting rods</li> <li>• pistons and rings</li> <li>• camshaft</li> <li>• valves</li> <li>• inlet and exhaust manifolds</li> <li>• turbocharger</li> <li>• flywheel</li> <li>• front drive pulley</li> <li>• gaskets and seals</li> </ul> <p><b>Purpose and function of main components to include:</b></p> <ul style="list-style-type: none"> <li>• cylinder block</li> <li>• cylinder head</li> <li>• engine sump</li> <li>• crankshaft</li> <li>• piston and rings</li> <li>• connecting rod</li> <li>• flywheel</li> <li>• camshaft</li> <li>• inlet and exhaust valves</li> <li>• inlet and exhaust manifolds</li> <li>• turbocharger</li> <li>• gaskets and seals</li> </ul> <p><b>Function of main CI engine systems include:</b></p> <ul style="list-style-type: none"> <li>• induction system and turbocharger</li> <li>• low and high pressure fuel system (Fuel pumps, Injectors, filters, fuel lines)</li> <li>• exhaust system</li> <li>• lubrication system</li> <li>• cooling system</li> <li>• starting system</li> <li>• charging system</li> </ul>	<p>1.1-1.3</p>
<p><b>The operating cycles for 4 stroke CI engines to include to include:</b></p> <ul style="list-style-type: none"> <li>• stages of operation - induction, compression, power and exhaust</li> <li>• piston position and movement</li> <li>• firing orders for 4 cylinder engine</li> <li>• engine terminology – bore, stroke, capacity, TDC, BDC, compression ratio, direct injection, indirect injection</li> <li>• mixing of fuel and air</li> </ul> <p><b>Valve and injection timing to include:</b></p> <ul style="list-style-type: none"> <li>• piston position when opening and closing valves</li> <li>• piston position for timing of injection</li> </ul> <p><b>Air to fuel ratios differ from SI engine to include:</b></p> <ul style="list-style-type: none"> <li>• Compression of air only</li> <li>• Point of fuel injection (CI- near end of compression stroke, SI- on induction stroke)</li> <li>• Benefits of pressure charging CI Engines compared to SI engines- less chance of detonation as no fuel during CI compression</li> <li>• wider range of air/fuel ratios</li> </ul> <p><b>Exhaust emissions to include:</b></p> <ul style="list-style-type: none"> <li>• exhaust gas emissions – H<sub>2</sub>O, O, N, CO<sub>2</sub>, CO, HC, NO<sub>x</sub>, particulates</li> </ul>	<p>2.1-2.4</p>



<b>UNIT REF: L1MV21</b>	<b>UNIT TITLE: AIR AND LIQUID COOLING SYSTEM COMPONENTS AND OPERATION</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT: 20 Hours</b>
<p><b>Overview:</b> This unit introduces learners to the principles of engine liquid cooling and air-cooling components and operation. It covers identifying the main components used in liquid cooling and air-cooling systems and the purpose and function of these components.</p> <p>The learner also has to carry out practical activities of removing and refitting liquid cooling system components and testing it for leaks.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know about engine liquid cooling and air-cooled systems	1.1 Identify the main components used in engine liquid cooling systems 1.2 State the purpose of the main components used in engine liquid cooling systems
2 Know how engine cooling systems operate	2.1 State the operating principles of engine liquid cooling systems
3 Be able to carry out routine maintenance on engine liquid cooling systems	3.1 Work safely on cooling systems 3.2 Select and use the correct technical data, tools and equipment for routine maintenance of liquid cooling systems 3.3 Demonstrating the correct procedures when removing and refitting a radiator and thermostat and refilling the cooling system 3.4 Demonstrating the correct procedures for tensioning the coolant drive belts 3.5 Demonstrating the correct procedures for pressure testing the cooling system and checking for leaks
4 Know about environmental considerations when disposing of waste materials	4.1 Identify appropriate ways to dispose of waste products in accordance with environmental guidance
5 Be able to clean the work area and leave in a safe condition	5.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition

<b>Evidence Requirements</b>
<b>You must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one occasion:</b>
Removing and refitting a radiator, thermostat and refilling the cooling system
Using the correct procedures for tensioning the coolant drive belts
Using the correct procedures for pressure testing the cooling system and checking for leaks



Unit Content	Assessment Criteria
<p><b>The main components in engine liquid cooling systems to include:</b></p> <ul style="list-style-type: none"> <li>• coolant – water and antifreeze mixture</li> <li>• radiator and radiator cap</li> <li>• thermostat</li> <li>• expansion tank</li> <li>• pipes and hoses</li> <li>• gaskets and sealing rings</li> <li>• water pump and drive belt</li> <li>• cooling fan – mechanical and electric</li> <li>• vehicle heater</li> </ul> <p><b>Purpose and function of main liquid cooling system components to include:</b></p> <ul style="list-style-type: none"> <li>• coolant</li> <li>• radiator and radiator cap</li> <li>• thermostat</li> <li>• expansion tank</li> <li>• pipes and hoses</li> <li>• gaskets and sealing rings</li> <li>• water pump and drive belt</li> <li>• cooling fan – mechanical and electric</li> <li>• vehicle heater</li> </ul>	<p>1.1, 1.2</p>
<p><b>The operating principle of engine liquid and air cooling systems and components to include:</b></p> <ul style="list-style-type: none"> <li>• conduction, convection and radiation principles</li> <li>• thermo-siphon principle</li> <li>• pressurised systems</li> <li>• radiator</li> <li>• radiator pressure cap</li> <li>• expansion tank</li> <li>• thermostat</li> <li>• mechanical and electric fans</li> <li>• fan</li> <li>• heat exchangers</li> <li>• air flow ducting</li> <li>• cooling fins</li> </ul>	<p>2.1</p>
<p><b>Disposal of waste products in accordance with environmental guidance include:</b></p> <ul style="list-style-type: none"> <li>• safe collection and storage of used components and liquids</li> <li>• legal and local disposal methods</li> </ul>	<p>4.1</p>



<b>UNIT REF: L1MV22</b>	<b>UNIT TITLE: LUBRICATION SYSTEM COMPONENTS AND OPERATION</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT: 20 Hours</b>
<p><b>Overview:</b> This unit introduces learners to the principles of engine lubrication systems, components and operation. It covers identifying the main components used in lubrication systems and the purpose and function of these components. The learner also has to carry out practical activities of removing and refitting lubrication system components.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know about engine lubrication systems	1.1 Identify the main components used in engine lubrication systems 1.2 State the purpose of the main components used in engine lubrication systems
2 Know how engine lubrication systems operate	2.1 State the operating principles of engine lubrication systems
3 Be able to carry out routine maintenance on engine lubrication systems	3.1 Working safely on an engines lubrication system 3.2 Select the correct technical data, tools and equipment for routine maintenance of engine lubrication systems 3.3 Demonstrate the correct procedures when changing the oil and filter on a vehicle 3.4 Demonstrate the correct procedures when replacing a gasket on an engine component 3.5 Demonstrate the correct procedures when checking and inspecting an engine for oil leaks
4 Know the environmental considerations when disposing of waste materials	4.1 Identify appropriate ways to dispose of waste products in accordance with environmental guidance
5 Be able to clean the work area and leave in a safe condition	5.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition

<b>Evidence Requirements</b>
<b>You must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one occasion:</b>
Changing the engine oil and oil filter on a vehicle
Replacing a gasket on an engine component
Using the correct procedure to check and inspect an engine for oil leaks



Unit Content	Assessment Criteria
<p><b>The main components in engine lubrication systems to include:</b></p> <ul style="list-style-type: none"><li>• lubricants – natural and synthetic</li><li>• engine sump</li><li>• oil pump and strainer</li><li>• pressure relief valve</li><li>• oil filter</li><li>• oil galleries</li></ul> <p><b>Purpose and function of main engine lubrication components to include:</b></p> <ul style="list-style-type: none"><li>• lubricant – purpose and function (cooling, reduce friction, remove by-products, reduce corrosion)</li><li>• lubricant – types &amp; composition, natural &amp; synthetic, grades, viscosity, properties</li><li>• engine sump</li><li>• oil pump and strainer</li><li>• pressure relief valve</li><li>• oil filter</li><li>• oil galleries</li></ul>	1.1, 1.2
<p><b>The operating principle of engine lubrication systems and components to include:</b></p> <ul style="list-style-type: none"><li>• spray, splash, pressurised lubrication</li><li>• boundary lubrication</li><li>• sump</li><li>• oil pump</li><li>• oil filter</li><li>• oil pressure relief valve</li><li>• pressure monitoring (warning light, gauge)</li></ul>	2.1
<p><b>Disposal of waste products in accordance with environmental guidance include:</b></p> <ul style="list-style-type: none"><li>• safe collection and storage of used components and liquids</li><li>• legal and local disposal methods</li></ul>	4.1



<b>UNIT REF: ELMV25</b>	<b>UNIT TITLE: INTRODUCTION TO COMPRESSION IGNITION FUEL SYSTEMS</b>
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<b>Level: Entry Level 3</b>	<b>GL: 13 Hours</b>	<b>TQT: 18 Hours</b>
<b>Overview:</b> In this unit the learners will find out about the main components and the operating principles of vehicle fuel systems including routine maintenance procedures required for effective engine operation.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Be able to work safely	1.1. Use appropriate PPE and methods when working on compression ignition fuel systems
2. Know the components of compression ignition fuel systems	2.1. Identify the major parts of the compression ignition fuel system 2.2. State the precautions to be taken when working on compression ignition fuel systems
3. Be able to change air filters and visual check for fuel leaks	3.1. Change an engine air filter element 3.2. Remove and refit a compression ignition engine fuel filter cleaning up any spillages 3.3. Perform visual check for fuel leakage
4. Know how to dispose of fuel system components and fluids	4.1. State how to dispose of fuel system components

<b>Evidence Requirements</b>
<b>You must be observed by your assessor completing all of the tasks listed below on at least one occasion:</b>
Changing an engine air filter.
Removing and refitting a compression ignition engine fuel filter.
Performing a visual check for fuel leaks.

<b>Unit Content</b>	<b>Assessment Criteria</b>
<b>The major parts of the fuel system of spark ignition engines to include:</b> <ul style="list-style-type: none"> <li>• fuel tank</li> <li>• fuel line</li> <li>• fuel filter</li> <li>• fuel pressurising system</li> <li>• fuel metering system</li> <li>• fuel delivery system</li> <li>• air intake and filtration</li> </ul> <b>The safety factors to be considered when working with fuel systems to include:</b> <ul style="list-style-type: none"> <li>• fire precautions</li> <li>• exhaust fumes when running an engine in a workshop</li> <li>• handling and disposing of materials</li> <li>• preventing ingress of dirt, moisture and foreign matter</li> </ul>	2.1, 2.2
<b>Appropriate ways to dispose of waste products in accordance with environmental guidance to include:</b> <ul style="list-style-type: none"> <li>• disposal of used air/fuel filters</li> <li>• disposal of contaminated or spilt fuel</li> <li>• clearing up spillages and disposal of absorbent materials</li> </ul>	4.1



<b>UNIT REF: L1MV26</b>	<b>UNIT TITLE: COMPRESSION IGNITION FUEL SYSTEM MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT: 20 Hours</b>
<p><b>Overview:</b> In this unit the learner will be introduced to the main components and the operating principles of a Compression Ignition (CI) fuel system. It covers identification of the main components used in the mechanical and hydraulic systems and include the routine maintenance procedures required for effective engine operation.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know the components of compression ignition engine fuel systems	1.1 Identify the main components used in CI fuel systems 1.2 State the purpose of the main components used in CI fuel systems
2 Know how compression ignition engine systems operate	2.1 State the operating principles of CI fuel systems
3 Be able to maintain compression ignition engine fuel systems	3.1 Work safely on CI fuel systems 3.2 Select the correct technical data, tools and equipment for CI engine fuel system maintenance 3.3 Demonstrate the correct procedures when removing and refitting a compression ignition engine air filter 3.4 Demonstrate the correct procedures when removing and refitting a compression ignition engine fuel filter 3.5 Perform a visual check for fuel leakage
4 Know about environmental considerations when disposing of waste materials	4.1 Identify appropriate ways to dispose of waste products in accordance with environmental guidance
5 Be able to clean the work area and leave in a safe condition	5.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one occasion:</b>
Using the correct procedures when replacing a compression ignition engine air filter
Using the correct procedures when replacing a compression ignition fuel filter
Carrying out a visual inspection for fuel leakage





Unit Content	Assessment Criteria
<p><b>The main components and purpose of compression ignition fuel system to include:</b></p> <ul style="list-style-type: none"> <li>• fuel tank</li> <li>• fuel line</li> <li>• fuel filter</li> <li>• fuel pressurising system (high and low pressure)</li> <li>• fuel metering &amp; delivery system (common rail, injectors)</li> <li>• air intake and filtration systems</li> <li>• ECU</li> </ul>	<p>1.1, 1.2</p>
<p><b>The operating principles for CI fuel system engines to include to include:</b></p> <ul style="list-style-type: none"> <li>• stages of operation - induction, compression, power and exhaust</li> <li>• piston position and movement</li> <li>• firing orders for 4 cylinder engine</li> <li>• direct/indirect and electronic injection systems</li> <li>• high / low pressure circuits</li> <li>• injection timing</li> <li>• mixing of fuel and air</li> </ul> <p><b>Valve and ignition timing to include:</b></p> <ul style="list-style-type: none"> <li>• piston position when opening and closing valves</li> <li>• piston position for fuel injection</li> <li>• need to vary injection timing with increase in engine speed</li> </ul> <p><b>Air fuel mixture to include:</b></p> <ul style="list-style-type: none"> <li>• Compression of air only</li> <li>• Point of fuel injection (CI- near end of compression stroke, SI- on induction stroke)</li> <li>• Benefits of pressure charging CI Engines compared to SI engines- less chance of detonation as no fuel during CI compression</li> <li>• wider range of air/fuel ratios</li> </ul> <p><b>Exhaust emission to include:</b></p> <ul style="list-style-type: none"> <li>• environmental and health concerns for exhaust emissions</li> <li>• exhaust gas emissions – H<sub>2</sub>O, O, N, CO<sub>2</sub>, CO, HC, NO<sub>x</sub></li> </ul>	<p>2.1</p>
<p><b>Disposal of waste products in accordance with environmental guidance include:</b></p> <ul style="list-style-type: none"> <li>• safe collection and storage of used components and liquids</li> <li>• legal and local disposal methods</li> </ul>	<p>4.1</p>



<b>UNIT REF: ELMV21</b>	<b>UNIT TITLE: VEHICLE DRIVELINE MAINTENANCE</b>
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<b>Level: Entry Level 3</b>	<b>GL: 17 Hours</b>	<b>TQT: 22 Hours</b>
<b>Overview:</b> This unit introduces the learner to vehicle transmission systems and covers the basic identification of the major items of the unit and their function. It also allows the learner to use workshop manuals to locate specific data.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Be able to work safely	1.1. Use appropriate PPE when working on vehicle drivelines 1.2. Use appropriate and safe working practices when working on vehicle drivelines
2. Know about vehicle drivelines	2.1. Identify the different driveline system components fitted to a vehicle
3. Know about vehicle gearboxes	3.1. Identify a range of simple manual gearbox and clutch components
4. Be able to carry out routine maintenance checks on vehicle drivelines	4.1. Locate appropriate information and technical data for routine vehicle driveline maintenance 4.2. Demonstrate the correct procedures to check and top up the level in a manual gearbox 4.3. Check for fluid leaks on a vehicle driveline system

<b>Evidence Requirements</b>
<b>You must be observed by your assessor completing all the tasks listed below on at least one occasion:</b>
Check and top up the fluid levels in a manual gearbox.
Check for leaks on a vehicle driveline system

<b>Unit Content</b>	<b>Assessment Criteria</b>
<b>The vehicle driveline includes :</b> <ul style="list-style-type: none"> <li>• drive shafts</li> <li>• gearbox</li> <li>• constant velocity joints</li> <li>• propeller shaft</li> </ul>	2.1
<b>The main components of a manual gearbox and clutch to include:</b> <ul style="list-style-type: none"> <li>• clutch plate</li> <li>• cover assembly</li> <li>• thrust bearing</li> <li>• casing</li> <li>• gears</li> <li>• selectors</li> <li>• flywheel</li> <li>• housing</li> </ul>	3.1



<b>UNIT REF: ELMV20</b>	<b>UNIT TITLE: ROUTINE VEHICLE MAINTENANCE PROCESSES AND PROCEDURES</b>
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<b>Level: Entry Level 3</b>	<b>GL: 17 Hours</b>	<b>TQT: 22 Hours</b>
<b>Overview:</b> This unit introduces learners to the principles of routine vehicle maintenance on vehicles with 4 wheels or more. It requires learners to know the tools and equipment that would be used during routine vehicle maintenance. It also covers the procedures and methods that must be used to ensure this is carried out effectively. The final outcome of the unit is concerned with the learner being able to safely and correctly carry out routine vehicle maintenance.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Be able to work safely	1.1. Use appropriate PPE when carrying out routine vehicle maintenance 1.2. Use appropriate and safe working practices when carrying out routine vehicle maintenance
2. Know vehicle components and systems that require routine maintenance	2.1. Identify the main components and systems found on a modern vehicle that require routine maintenance 2.2. Show use of a logical approach to carrying out a maintenance check
3. Know routine maintenance requirements for vehicle systems and components	3.1. Locate the correct and appropriate sources of information, tools and equipment required to carry out basic routine vehicle maintenance

<b>Evidence Requirements</b>
<b>You must be observed by your assessor completing the task below on at least one occasion:</b>
Carry out routine vehicle maintenance



Unit Content	Assessment Criteria
<p><b>Components that require routine inspection to include:</b></p> <ul style="list-style-type: none"> <li>• tyres – wear and condition</li> <li>• wheels – damage, buckling</li> <li>• brakes – wear, adjustment, fluid leaks, fluid level, corrosion of pipes, condition of hoses</li> <li>• steering and suspension – security of components, wear of joints, suspension damper</li> <li>• electrical – battery, alternator, warning lamps, front and rear wipers, horn</li> <li>• lighting – function of side and rear lamps, number plate lamp, headlamps, dip and main beam control, boot lamp (on and off), interior lamps, indicators, hazard lamps, front and rear fog lamps</li> <li>• engine compartment – washer fluid, brake fluid level, coolant leaks and level, oil leaks and level, bonnet release, battery, drive belts</li> <li>• transmission – clutch operation and adjustment, drive shafts, joints, rubber boots, fluid leaks</li> <li>• vehicle exterior – bodywork, paintwork, trim, doors and door locks, wing mirror condition</li> <li>• vehicle interior – seats (condition &amp; adjustment), seat belts, driver controls, warning lamps, wing mirror operation</li> </ul> <p><b>Use a Logical approach to carrying out a vehicle check :</b></p> <ul style="list-style-type: none"> <li>• Move round the vehicle in a logical approach</li> <li>• Check all items on a competent check sheet</li> <li>• Check sheet is completed within an acceptable time</li> </ul>	<p>2.1, 2.2</p>
<p><b>Information, tools and equipment to include:</b></p> <ul style="list-style-type: none"> <li>• vehicle specifications and data</li> <li>• vehicle manufacturer’s inspection requirements</li> <li>• vehicle manuals</li> <li>• vehicle inspection check lists</li> <li>• trolley jack and axle stands</li> <li>• vehicle lifting equipment</li> <li>• spanners and sockets</li> <li>• torque wrench</li> <li>• screwdrivers</li> <li>• levers and bars</li> <li>• inspection lamps</li> <li>• tyre tread depth indicator</li> <li>• measurement tools</li> </ul>	<p>3.1</p>



<b>UNIT REF: L1MV27</b>	<b>UNIT TITLE: VEHICLE STEERING AND SUSPENSION SYSTEM COMPONENTS AND MAINTENANCE (4 WHEELS OR MORE)</b>
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<b>Level: 1</b>	<b>GL: 22 Hours</b>	<b>TQT: 30 Hours</b>
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**Overview:** This unit introduces learners to the principles of vehicle steering and suspension system components and operation. It covers identifying the main components used in steering and suspension systems and the purpose and function of these components. It also requires the learner to remove and replace steering and suspension components.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know about non-assisted and assisted steering and suspension components	1.1 Identify the main components used in non-assisted and assisted steering systems  1.2 State the purpose of the main components used in non-assisted and assisted steering systems  1.3 Identify the main components used in common suspension systems  1.4 State the purpose of the main components used in common suspension systems
2 Know how non-assisted and assisted steering and suspension systems operate	2.1 State the operating principles of non-assisted and assisted steering systems and components  2.2 State the operating principles of suspension systems and components
3 Be able to carry out routine maintenance on steering systems	3.1 Work safely on steering systems  3.2 Select and use the correct technical data, tools and equipment for routine maintenance of steering systems  3.3 Demonstrate the correct procedure when removing and refitting a steering component  3.4 Demonstrate the correct procedures for adjusting front wheel alignment (toe) to within manufacturer's tolerance  3.5 Demonstrate the correct procedures for checking and topping up power steering fluid levels
4 Be able to carry out routine maintenance on suspension systems	4.1 Work safely on suspension systems  4.2 Select and use the correct technical data, tools and equipment for routine maintenance of suspension systems  4.3 Demonstrate the correct procedures when checking suspension systems for leaks and visually obvious defects  4.4 Demonstrate the correct procedures when removing and refitting a complete suspension unit
5 Be able to clean the work area and leave in a safe condition.	5.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.



Evidence Requirements
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and replacing a steering component
Correctly adjusting front wheel alignment within manufacturer's specification
Checking and topping up power steering fluid levels
Visually inspecting a suspension system
Removing and refitting a suspension unit

Unit Content	Assessment Criteria
<p><b>The main components in steering systems to include:</b></p> <ul style="list-style-type: none"> <li>• steering wheel</li> <li>• steering column</li> <li>• steering joints and couplings</li> <li>• steering gearbox – rack and pinion system and conventional steering box types</li> <li>• manual and power steering</li> <li>• drag link</li> <li>• track rods</li> <li>• steering arms</li> <li>• track control arm</li> <li>• track rod ends</li> <li>• rubber gaitors</li> <li>• swivel pin and front hub assembly</li> </ul> <p><b>Purpose of steering system components to include:</b></p> <ul style="list-style-type: none"> <li>• steering column – including impact absorbing and telescopic aspects</li> <li>• steering joints and couplings</li> <li>• steering gearbox – rack and pinion system and conventional steering box type</li> <li>• function of drag link, track rods, steering arms, track control arm, track rod ends, rubber gaitors</li> <li>• ball joints and front hub assembly</li> <li>• manual and power steering (Pump, Fluid lines, Drive belts)</li> </ul> <p><b>The main components in suspension systems to include:</b></p> <ul style="list-style-type: none"> <li>• springing methods – metal, rubber, fluid, air</li> <li>• spring types – leaf, coil, torsion bar, rubber, fluid, air</li> <li>• suspension damper</li> <li>• beam axle arrangement</li> <li>• independent suspension</li> <li>• Independent Suspension types – Macpherson strut, wishbone, trailing arm</li> <li>• anti-roll bars</li> </ul> <p><b>Purpose of suspension components to include:</b></p> <ul style="list-style-type: none"> <li>• action of springs – leaf, coil, torsion bar</li> <li>• function of suspension damper</li> </ul>	<p>1.1, 1.2, 1.3, 1.4</p>



Unit Content	Assessment Criteria
<p><b>The operating principles of steering system to include:</b></p> <ul style="list-style-type: none"><li>• Ackermann layout</li><li>• Camber</li><li>• Castor</li><li>• Swivel Axis Inclination (formerly KPI)</li><li>• front wheel alignment (toe)</li><li>• steering gearbox – rack and pinion system and conventional steering box types</li><li>• front hubs</li></ul> <p><b>The operating principle of suspension systems to include:</b></p> <ul style="list-style-type: none"><li>• IFS</li><li>• IRS</li><li>• beam axle arrangement – layout, disadvantages</li><li>• independent suspension – layouts, advantages</li><li>• action of suspension – Macpherson strut, wishbone, trailing arm, anti-roll bar</li><li>• bump and rebound (including methods of damping)</li></ul>	<p>2.1, 2.2</p>



<b>UNIT REF: L1MV19</b>	<b>UNIT TITLE: SPARK IGNITION ENGINE SYSTEM COMPONENTS AND OPERATION</b>
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<b>Level: 1</b>	<b>GL: 22 Hours</b>	<b>TQT: 30 Hours</b>
<p><b>Overview:</b> This unit introduces learners to the principles of Spark Ignition (SI) engine system components and operation and includes the requirements for carrying out routine engine maintenance. The learner also has to carry out practical activities of removing and refitting a cylinder head to an SI engine.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Know spark ignition engine systems and components	1.1 Identify the main components used in SI engines  1.2 State the purpose of the main components used in SI engines  1.3 Outline the purpose of the main systems used in SI engines
2. Know how spark ignition engines operate	2.1 State the operating cycle of the 2 and 4 stroke SI engines  2.2 Give examples of the valve and ignition timing requirements for 4 stroke SI engines  2.3 State the correct air/fuel mixture for SI engines during different situations  2.4 Identify the constituents of SI exhaust gas emissions and their effects on health and the environment.
3. Be able to safely and correctly carry out routine spark ignition engine maintenance	3.1 Work safely on SI engine systems  3.2 Select and use the correct technical data, tools and equipment for SI engine maintenance  3.3 Demonstrate the correct procedures when removing and refitting an SI engine cylinder head from a fully equipped non running stand engine  3.4 Demonstrate the correct procedures for reinstating the engine and vehicle after SI engine maintenance
4. Be able to clean the work area and leave in a safe condition	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the following activities listed below on <b>at least one occasion</b> :
Removing and refitting an SI cylinder head from an engine
Using correct procedures for reinstating the engine and vehicle after SI maintenance





Unit Content	Assessment Criteria
<p><b>The main engine components to include:</b></p> <ul style="list-style-type: none"> <li>• cylinder block</li> <li>• cylinder head</li> <li>• engine sump</li> <li>• crankshaft</li> <li>• connecting rods</li> <li>• pistons and rings</li> <li>• camshaft</li> <li>• valves</li> <li>• inlet and exhaust manifolds</li> <li>• flywheel</li> <li>• front drive pulley</li> <li>• gaskets and seals</li> </ul> <p><b>Purpose and function of main components to include:</b></p> <ul style="list-style-type: none"> <li>• cylinder block</li> <li>• cylinder head</li> <li>• engine sump</li> <li>• crankshaft</li> <li>• piston and rings</li> <li>• connecting rod</li> <li>• flywheel</li> <li>• camshaft</li> <li>• inlet and exhaust valves</li> <li>• inlet and exhaust manifolds</li> <li>• gaskets and seals</li> </ul> <p><b>Purpose of main SI engine systems include:</b></p> <ul style="list-style-type: none"> <li>• induction and fuel system</li> <li>• exhaust system</li> <li>• lubrication system</li> <li>• cooling system</li> <li>• ignition system</li> <li>• starting system</li> <li>• charging system</li> </ul>	<p>1.1-1.3</p>
<p><b>The operating cycles for 2 and 4 stroke engines to include to include:</b></p> <ul style="list-style-type: none"> <li>• stages of operation - induction, compression, power and exhaust</li> <li>• piston position and movement</li> <li>• firing orders for 4 cylinder engine</li> <li>• engine terminology – bore, stroke, capacity, TDC, BDC, compression ratio</li> <li>• mixing of fuel and air</li> </ul> <p><b>Valve and ignition timing to include:</b></p> <ul style="list-style-type: none"> <li>• piston position when opening and closing valves</li> <li>• piston position for timing of spark</li> <li>• need to vary ignition timing with increase in engine speed</li> </ul> <p><b>Air fuel mixture to include:</b></p> <ul style="list-style-type: none"> <li>• stoichiometric air/fuel ratio</li> <li>• weak mixture</li> <li>• rich mixture</li> <li>• lambda</li> </ul> <p><b>Exhaust emission to include:</b></p> <ul style="list-style-type: none"> <li>• environmental and health concerns for exhaust emissions</li> <li>• exhaust gas emissions – H<sub>2</sub>O, N, CO<sub>2</sub>, CO, HC, NO<sub>x</sub></li> </ul>	<p>2.1-2.4</p>



<b>UNIT REF: L1MV28</b>	<b>UNIT TITLE: LIGHT VEHICLE BRAKING SYSTEM COMPONENTS AND MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 21 Hours</b>	<b>TQT: 30 Hours</b>
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**Overview:** This unit introduces learners to the principles of vehicle braking system components and operation. It covers identifying the main components used in the mechanical and hydraulic braking systems and the purpose and function of these components. The learner also has to carry out practical routine maintenance on light vehicle braking systems.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know non-ABS vehicle braking system components	1.1 Identify the main mechanical components used in vehicle braking systems  1.2 Identify the main hydraulic components in non-ABS vehicle braking systems
2 Know how basic vehicle braking systems operate	2.1 State the operating principles of mechanical vehicle braking systems and components  2.2 State the operating principles of non-ABS hydraulic braking systems and components
3 Be able to carry out routine maintenance on vehicle braking systems	3.1 Work safely on vehicle braking systems  3.2 Select and use the correct technical data, tools and equipment for routine maintenance of vehicle braking systems  3.3 Demonstrate the correct procedures when removing and replacing brake pads and brake shoes  3.4 Demonstrate the correct procedures when adjusting handbrake mechanisms  3.5 Demonstrate the correct procedures for bleeding brakes during routine maintenance on vehicle braking systems
4 Know about environmental considerations when disposing of waste materials	4.1 Identify appropriate ways to dispose of waste products in accordance with environmental guidance
5 Be able to clean the work area and leave in a safe condition.	5.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and replacing brake pads and brake shoes
Using the correct procedure to adjust a handbrake mechanism
Bleeding a braking system using the correct procedures



Unit Content	Assessment Criteria
<p><b>The mechanical components in vehicle braking systems to include:</b></p> <ul style="list-style-type: none"> <li>• drum brakes – brake pedal, brake shoes, leading shoe, trailing shoe, adjusters, return springs, backing plate, parking brake mechanism</li> <li>• disc brakes – front disc brake system, disc pads, brake calliper, brake disc, parking brake system</li> </ul> <p><b>The hydraulic components in vehicle braking systems to include:</b></p> <ul style="list-style-type: none"> <li>• single and dual line layout</li> <li>• master cylinders</li> <li>• wheel cylinders</li> <li>• disc brake caliper &amp; pistons</li> <li>• brake lines and flexible pipes</li> <li>• brake servo</li> <li>• requirements and hazards of brake fluid – boiling point, hygroscopic action, potential to damage paint surfaces</li> <li>• manufacturer’s change periods for brake fluid</li> </ul>	<p>1.1, 1.2</p>
<p><b>The operating principles of mechanical braking systems to include:</b></p> <ul style="list-style-type: none"> <li>• fundamental braking principles – converting kinetic energy to heat energy</li> <li>• coefficient of friction – between tyres and road, between brake shoes and brake drum, brake pad and brake disc</li> <li>• advantages / disadvantages of drum brakes and disc brakes</li> <li>• action of drum brakes, leading and trailing brake shoes, self-servo action</li> <li>• action of disc brakes, brake calliper, pad retraction</li> <li>• terms associated with braking systems, braking efficiency, brake fade, brake balance, ABS</li> </ul> <p><b>The operating principle of hydraulic braking systems to include:</b></p> <ul style="list-style-type: none"> <li>• action of brake fluid – incompressible, equalising force, absorption of moisture, effect of air in system, requirement to change fluid, need to bleed system</li> <li>• action of master cylinders and wheel cylinders, brake calliper’s, brake pad retraction, equalising valves</li> <li>• action of brake servo</li> <li>• split braking systems</li> </ul>	<p>2.1, 2.2</p>



<b>UNIT REF: L1MV29</b>	<b>UNIT TITLE: LIGHT VEHICLE WHEEL AND TYRE CONSTRUCTION AND MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT: 20 Hours</b>
<p><b>Overview:</b> This unit introduces learners to light vehicle road wheels and tyres and their routine maintenance requirements. It includes identifying the construction of road wheels and tyres and the applications to different types of light vehicle. The learner also covers road wheel and tyre terminology, tyre markings, legal requirements and the will carry out the procedures for replacing standard tyres.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know how wheel and tyres are constructed	1.1 Identify the types of tyre used on common road vehicles  1.2 Identify the construction of radial and cross ply tyres  1.3 Identify the types of wheel used on road vehicles
2 Know wheel and tyre terminology	2.1 Give examples of the markings and terminology associated with vehicle wheels and tyres
3 Be able to carry out routine maintenance and replacement of road wheels and tyres	3.1 Work safely when working with road wheels and tyres  3.2 Select and use the correct technical data, tools and equipment for maintaining wheels and tyres  3.3 Demonstrate the correct procedures to remove and refit a road wheel to a vehicle  3.4 Demonstrate correct procedures to remove and refit a standard tubeless tyre to a road wheel  3.5 Demonstrate correct procedures to balance a wheel and tyre to within acceptable tolerances  3.6 Demonstrate the correct method to check a tyres suitability and legality for fitment to a vehicle
4 Know about environmental considerations when disposing of waste materials	4.1 Identify appropriate ways to dispose of waste products in accordance with environmental guidance
5 Be able to clean the work area and leave in a safe condition	5.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one occasion:</b>
Removing and refitting a road wheel to a vehicle
Removing and refitting a standard tubeless tyre to a road wheel
Balancing a wheel and tyre using the correct procedures
Inspecting a tyre for legality and suitability for fitment to a vehicle



Unit Content	Assessment Criteria
<p><b>The common types of tyre used on road vehicles to include:</b></p> <ul style="list-style-type: none"><li>• radial ply tyre</li><li>• cross ply</li><li>• tube type tyres</li><li>• tubeless tyres</li></ul> <p><b>The main construction details of radial and cross ply tyres to include:</b></p> <ul style="list-style-type: none"><li>• casing plies - the arrangement for cross ply and radial designs</li><li>• tyre tread – types and applications for car, motorcycle, truck, caravans, trailers, specialist vehicles, on-road and off-road tyres</li><li>• tread depth indicator</li><li>• tyre bead</li><li>• tread bracing</li><li>• tyre sidewall</li></ul> <p><b>The common types of wheel used on road vehicles to include:</b></p> <ul style="list-style-type: none"><li>• alloy wheels</li><li>• pressed steel wheels</li><li>• space saver wheels</li><li>• split rim wheels</li></ul>	1.1, 1.2, 1.3
<p><b>The markings and terminology associated with vehicle wheels and tyres to include:</b></p> <ul style="list-style-type: none"><li>• tyre type marking</li><li>• tyre and wheel diameter</li><li>• tyre section width</li><li>• tread depth</li><li>• tyre aspect ratio</li><li>• speed rating</li><li>• load index</li></ul>	2.1



<b>UNIT REF: L1MV31</b>	<b>UNIT TITLE: LIGHT VEHICLE EXHAUST SYSTEM COMPONENTS AND MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT:20 Hours</b>
<p><b>Overview:</b> This unit introduces learners to the fundamental principles of light vehicle exhaust systems. It requires learners to know how to work safely when removing and refitting exhaust system and includes the identification of the main components.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know exhaust systems components	1.1 Identify the components used in modern light vehicle exhaust systems  1.2 State the purpose of each major part of the exhaust system  1.3 State the correct sequence and procedure for removing and refitting a light vehicle exhaust system and components
2 Know how exhaust systems operate	2.1 State the operating principles of exhaust systems and components
3 Be able to remove and refit exhaust systems	3.1 Work safely on light vehicle exhaust systems  3.2 Select and use the appropriate technical data, tools and equipment for routine exhaust maintenance  3.3 Demonstrate the correct sequence and procedure for removing and refitting a complete light vehicle exhaust system and components
4 Be able to clean the work area and leave in a safe condition.	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and refitting a complete light vehicle exhaust system and components



Unit Content	Assessment Criteria
<p><b>The components used in vehicle exhaust systems to identify include:</b></p> <ul style="list-style-type: none"><li>• materials – steel, stainless steel</li><li>• exhaust manifold</li><li>• lambda sensor</li><li>• front pipe</li><li>• silencer box</li><li>• expansion box</li><li>• catalytic converter</li><li>• tail pipe</li><li>• exhaust system brackets</li><li>• exhaust system joints and gaskets</li></ul> <p><b>The purpose of exhaust components in vehicle exhaust systems to include:</b></p> <ul style="list-style-type: none"><li>• exhaust manifold</li><li>• lambda sensor</li><li>• front pipe</li><li>• silencer box</li><li>• expansion box</li><li>• catalytic converter</li><li>• tail pipe</li><li>• exhaust system brackets</li><li>• exhaust system joints and gaskets</li></ul> <p><b>Correct sequence and procedure to include:</b></p> <ul style="list-style-type: none"><li>• PPE</li><li>• waiting for components to cool</li><li>• correct sequence for given vehicle</li><li>• ventilation when engine running</li><li>• checking for leaks</li><li>• checking for correct alignment</li></ul>	1.1, 1.2, 1.3, 1.4
<p><b>Basic operation of exhaust systems include:</b></p> <ul style="list-style-type: none"><li>• Noise reduction</li><li>• Reduce engine exhaust emissions</li><li>• Noise regulations</li><li>• Service needs</li></ul>	2.1



<b>UNIT REF: ELMV22</b>	<b>UNIT TITLE: SPARK IGNITION SYSTEM MAINTENANCE</b>
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Level: Entry Level 3	GL: 13 Hours	TQT: 18 Hours
Overview: In this unit the learner will find out about the main components of vehicle ignition systems, their construction and correct usage including the carrying out of practical activities regarding inspection and maintenance.		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
The Learner will:	The Learner can:
1. Be able to work safely	1.1. Use appropriate PPE when working on vehicle ignition systems 1.2. Use appropriate and safe working practices when working with high voltage vehicle ignition systems
2. Know about vehicle ignition systems	2.1. Identify the main components of a spark ignition system 2.2. Outline the purpose of each main component
3. Be able to replace vehicle ignition components	3.1. Remove and replace an ignition coil/coil pack 3.2. Select correct type of spark plugs for engine being worked on by using technical data 3.3. Set the spark plug electrode gaps to within manufacturer's tolerances 3.4. Remove and replace easily accessible spark plugs 3.5. Check correct engine operation and throttle response following the activity

Evidence Requirements
<b>You must be observed by your assessor completing all of the tasks listed below on at least one occasion:</b>
Removing and replacing an ignition coil
Select correct type of spark plugs for engine being worked on by using technical data
Set the spark plug electrode gaps to within manufacturer's tolerances
Remove and replace easily accessible spark plugs
Check correct engine operation and throttle response following the activity

Unit Content	Assessment Criteria
<b>Main components of a vehicle ignition system to include:</b> <ul style="list-style-type: none"> <li>• ignition coils including coil on plug (COP), wasted spark coil packs</li> <li>• spark plugs</li> <li>• ECU</li> <li>• camshaft sensor</li> <li>• crankshaft sensor</li> <li>• knock sensor</li> </ul>	2.1, 2.2, 2.3





<b>UNIT REF: ELMV24</b>	<b>UNIT TITLE: INTRODUCTION TO SPARK IGNITION FUEL SYSTEMS</b>
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Level: Entry Level 3	GL: 12	TQT: 16
<b>Overview: In this unit the learners will find out about the main components and the operating principles of vehicle fuel systems including routine maintenance procedures required for effective engine operation.</b>		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Be able to work safely	1.1. Use appropriate PPE and methods when working on spark ignition fuel systems
2. Know the components of spark ignition fuel systems	2.1. Identify the major parts of the spark ignition fuel system 2.2. State the precautions to be taken when working on spark ignition fuel systems
3. Be able to change air filters and visually check for fuel leaks	3.1. Change an engine air filter element 3.2. Perform visual check for fuel leakage
4. Know how to dispose of fuel system components and fluids	4.1. State how to clean up fuel spills 4.2. State how to dispose of fuel system components

Evidence Requirements
<b>You must be observed by your assessor completing all of the tasks listed below on at least one occasion:</b>
Changing an engine air filter element.
Performing a visual check for fuel leaks.

Unit Content	Assessment Criteria
<b>The major parts of the fuel system of spark ignition engines to include:</b> <ul style="list-style-type: none"> <li>• fuel tank</li> <li>• fuel line</li> <li>• fuel filter</li> <li>• fuel pressurising system</li> <li>• fuel metering system</li> <li>• fuel delivery system</li> <li>• air intake and filtration</li> </ul>	2.1
<b>The safety factors to be considered when working with fuel systems to include:</b> <ul style="list-style-type: none"> <li>• fire precautions</li> <li>• exhaust fumes when running an engine in a workshop</li> <li>• handling and disposing of materials</li> <li>• preventing ingress of dirt, moisture and foreign matter</li> </ul>	2.2
<b>Appropriate ways to dispose of waste products in accordance with environmental guidance to include:</b> <ul style="list-style-type: none"> <li>• disposal of used air filters</li> <li>• disposal of contaminated or spilt fuel</li> <li>• clearing up spillages and disposal of absorbent materials</li> </ul>	4.1



<b>UNIT REF: L1MV34</b>	<b>UNIT TITLE: HEAVY VEHICLE WHEEL AND TYRE CONSTRUCTION AND MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT: 21 hours</b>
<p><b>Overview:</b> This unit introduces learners to road wheels and tyres and their routine maintenance requirements. It includes identifying the construction of road wheels and tyres and the applications to different types of vehicle. The unit also covers road wheel and tyre terminology, tyre markings, legal requirements and the procedures for replacing standard tyres.</p>		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know how wheel and tyres are constructed	1.1 Identify the types of tyre used on common road vehicles  1.2 Identify the construction of radial and cross ply tyres  1.3 Identify the types of wheel used on road vehicles
2 Know wheel and tyre terminology	2.1 Give examples of the markings and terminology associated with vehicle wheels and tyres
3 Be able to carry out routine maintenance and replacement of road wheels and tyres	3.1 Work safely when working with road wheels and tyres  3.2 Select and use the correct technical data, tools and equipment for maintaining wheels and tyres  3.3 Demonstrate the correct procedures to remove and refit a road wheel to a vehicle  3.4 Demonstrate correct procedures to remove and refit a standard tubeless tyre to a road wheel  3.5 Demonstrate correct procedures to balance a wheel and tyre to within acceptable tolerances  3.6 Demonstrate the correct method to check a tyres suitability and legality for fitment to a vehicle
4 Be able to clean the work area and leave in a safe condition.	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

Evidence Requirements
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and refitting a road wheel to a vehicle
Removing and refitting a standard tubeless tyre to a road wheel
Balancing a wheel and tyre to within acceptable tolerances
Using the correct method to check a tyres suitability and legality for fitment to a vehicle



Unit Content	Assessment Criteria
<p><b>The common types of tyre used on road vehicles to include:</b></p> <ul style="list-style-type: none"><li>• Radial ply tyre, cross ply, tube type tyres, tubeless tyres</li></ul> <p><b>The main construction details of radial and cross ply tyres to include:</b></p> <ul style="list-style-type: none"><li>• casing plies - the arrangement for cross ply and radial designs</li><li>• tyre tread – types and applications for car, motorcycle, truck, caravans, trailers, specialist vehicles, on-road and off-road tyres</li><li>• tread depth indicator</li><li>• tyre bead, tread bracing, tyre sidewall</li></ul> <p><b>The common types of wheel used on road vehicles to include:</b></p> <ul style="list-style-type: none"><li>• alloy wheels, pressed steel wheels, space saver wheels, split rim wheels</li></ul>	1.1, 1.2, 1.3
<p><b>The markings and terminology associated with vehicle wheels and tyres to include:</b></p> <ul style="list-style-type: none"><li>• tyre type marking, tyre and wheel diameter, tyre section width, tread depth, tyre aspect ratio, speed rating, load index</li></ul>	2.1



<b>UNIT REF: L1MV35</b>	<b>UNIT TITLE: HEAVY VEHICLE EXHAUST SYSTEM COMPONENTS AND MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT: 21 Hours</b>
<b>Overview:</b> This unit introduces learners to the fundamental principles of vehicle exhaust systems. It requires learners to know how to work safely when removing and refitting exhaust systems and includes the identification of the main components		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know exhaust systems components	1.1 Identify the components used in vehicle exhaust systems on modern CI engine vehicles  1.2 State the purpose of each major part of the exhaust system
2 Know how exhaust systems operate	2.1 State the operating principles of exhaust systems and components
3 Be able to remove and refit exhaust systems	3.1 Work safely whilst removing and refitting vehicle exhaust systems  3.2 Select and use the correct technical data, tools and equipment for exhaust system maintenance  3.3 Demonstrate the correct sequence and procedure for removing and refitting vehicle exhaust systems and components
4 Be able to clean the work area and leave in a safe condition.	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and refitting vehicle exhaust systems and components

<b>Unit Content</b>	<b>Assessment Criteria</b>
<b>The components used in vehicle exhaust systems to identify include:</b> <ul style="list-style-type: none"> <li>• Materials – steel, stainless steel, exhaust manifold, lambda sensor, front pipe, silencer box, expansion box, catalytic converter, tail pipe, exhaust system brackets, exhaust system joints and gaskets</li> </ul>	1.1, 1.2
<b>The purpose of exhaust components in vehicle exhaust systems could include:</b> <ul style="list-style-type: none"> <li>• Exhaust manifold, lambda sensor, front pipe, silencer box, expansion box, catalytic converter, tail pipe, exhaust system bracket, exhaust system joints and gaskets</li> </ul>	
<b>Basic operation of exhaust systems include:</b> <ul style="list-style-type: none"> <li>• Noise reduction</li> <li>• Reduce engine exhaust emissions</li> <li>• Noise regulations</li> <li>• Service needs</li> </ul>	2.1



<b>UNIT REF: L1MV36</b>	<b>UNIT TITLE: HEAVY VEHICLE BRAKING SYSTEM COMPONENTS AND MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 23 Hours</b>	<b>TQT: 31 hours</b>
<p><b>Overview:</b> This unit introduces learners to the principles of heavy vehicle braking systems, components and operation. It covers identifying the main components used in the mechanical, hydraulic and air braking systems and the purpose and function of these components. The learner also has to carry out practical routine maintenance on heavy vehicle braking systems.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know heavy vehicle braking system components	1.1. Identify the main mechanical components used in heavy vehicle braking systems 1.2. Identify the main hydraulic components used in heavy vehicle braking systems 1.3. Identify the main air components used in heavy vehicle braking systems
2 Know how basic heavy vehicle braking systems operate	2.1. State the operating principles of mechanical vehicle braking systems and components 2.2. State the operating principles of hydraulic vehicle braking systems and components 2.3. State the operating principles of air vehicle braking systems and components
3 Be able to carry out routine maintenance on heavy vehicle braking systems	3.1. Work safely on heavy vehicle braking systems 3.2. Select and use the correct technical data, tools and equipment for routine maintenance of vehicle braking systems 3.3. Demonstrate the correct procedures when removing and replacing brake pads and brake shoes 3.4. Demonstrate the correct procedures when checking/adjusting slack adjuster mechanisms
4 Be able to clean the work area and leave in a safe condition.	4.1. Use appropriate equipment and methods to clean the work area and leave in a safe condition.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and replacing brake pads
Removing and replacing brake shoes
Checking/adjusting slack adjuster mechanisms



Unit Content	Assessment Criteria
<p><b>The mechanical components in vehicle braking systems to include:</b></p> <ul style="list-style-type: none"> <li>• drum brakes – brake pedal, brake shoes, leading shoe, trailing shoe, adjusters, return springs, backing plate, parking brake mechanism</li> <li>• disc brakes – front disc brake system, disc pads, brake calliper, brake disc</li> </ul> <p><b>The hydraulic components in vehicle braking systems to include:</b></p> <ul style="list-style-type: none"> <li>• single and dual line layout, master cylinders, wheel cylinders, disc brake caliper &amp; pistons, brake lines and flexible pipes</li> </ul> <p><b>The air components in vehicle braking systems to include:</b></p> <ul style="list-style-type: none"> <li>• dual line systems, foot brake valve, compressor, brake pressure regulators, brake air dryers, multi circuit protection valve, relay valve, air dump valve, load sensing valves, warning signals</li> </ul>	<p>1.1, 1.2, 1.3</p>
<p><b>The operating principles of vehicle braking systems to include:</b></p> <ul style="list-style-type: none"> <li>• fundamental braking principles – converting kinetic energy to heat energy</li> <li>• coefficient of friction – between tyres and road, between brake shoes and brake drum, brake pad and brake disc</li> <li>• advantages of drum brakes and disc brakes</li> <li>• action of drum brakes, leading and trailing brake shoes, self-servo action</li> <li>• action of disc brakes, brake calliper, pad retraction</li> <li>• terms associated with braking systems, braking efficiency, brake fade, brake balance</li> </ul> <p><b>The operating principle of hydraulic braking systems to include:</b></p> <ul style="list-style-type: none"> <li>• action of brake fluid – incompressible, equalising force, absorption of moisture, effect of air in system, requirement to change fluid, need to bleed system</li> <li>• action of master cylinders and wheel cylinders, brake callipers, brake pad retraction split braking systems</li> </ul> <p><b>The operating principle of air braking systems to include:</b></p> <ul style="list-style-type: none"> <li>• advantages of air brakes, compression and storage, system control, system actuation</li> </ul>	<p>2.1, 2.2, 2.3</p>



<b>UNIT REF: L1MV38</b>	<b>UNIT TITLE: MOTORCYCLE STEERING AND SUSPENSION SYSTEM COMPONENTS AND MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 19 Hours</b>	<b>TQT: 26 Hours</b>
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**Overview:** This unit introduces learners to the principles of motorcycle steering and suspension systems, components and operation. It covers identifying the main components used in steering and suspension systems and the purpose and function of these components. It also requires the learner to remove and replace steering and suspension components.

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know how steering and suspension systems are constructed	1.1 Identify the main components used in steering systems 1.2 State the purpose of the main components used in steering systems 1.3 Identify the main components used in common suspension systems 1.4 State the purpose of the main components used in common suspension systems
2 Know how steering and suspension systems operate	2.1 State the operating principles of steering systems and components 2.2 State the operating principles of suspension systems and components
3 Be able to carry out routine maintenance on steering systems	3.1 Work safely on steering systems 3.2 Select and use the correct technical data, tools and equipment for routine maintenance of steering systems 3.3 Demonstrate the correct procedures when removing and refitting a pair of handlebars 3.4 Demonstrate the correct procedures for adjusting wheel alignment to within manufacturers tolerance
4 Be able to carry out routine maintenance on suspension systems	4.1 Work safely on suspension systems 4.2 Select and use the correct technical data, tools and equipment for routine maintenance of suspension systems 4.3 Demonstrate the correct procedures to check suspension systems for leaks and visually obvious defects 4.4 Demonstrate the correct procedures when removing and refitting a complete shock absorber assembly
5 Be able to clean the work area and leave in a safe condition.	5.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.



Evidence Requirements
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and refitting a pair of handlebars
Adjusting wheel alignment to within manufacturers tolerance
Checking a suspension system for leaks and visually obvious defects
Removing and refitting a complete shock absorber assembly

Unit Content	Assessment Criteria
<p><b>The main components in a conventional steering systems to include:</b></p> <ul style="list-style-type: none"> <li>• handlebars, handlebar clamps, steering yokes, steering damper, steering head bearings, forks, wheel spindle, wheels bearings</li> </ul> <p><b>Purpose of steering system layout and components to include:</b></p> <ul style="list-style-type: none"> <li>• steering yokes (triple clamps)</li> <li>• headstock bearings</li> <li>• ball race</li> <li>• taper roller</li> <li>• steering damper</li> </ul> <p><b>The main components in a conventional suspension systems to include:</b></p> <ul style="list-style-type: none"> <li>• single &amp; twin rear shock</li> <li>• swing arm</li> <li>• telescopic front forks</li> <li>• leading link</li> <li>• trailing link</li> </ul> <p><b>Purpose of suspension components to include:</b></p> <ul style="list-style-type: none"> <li>• coil springs</li> <li>• hydraulic dampers</li> <li>• trailing arms</li> <li>• swing arm</li> <li>• telescopic forks</li> <li>• bump stops</li> </ul>	1.1, 1.2, 1.3, 1.4
<p><b>The basic operating principles of steering systems</b></p> <ul style="list-style-type: none"> <li>• provide the rider with control of motorcycle direction</li> <li>• allow the rider to change direction easily</li> <li>• isolate rider from road shocks</li> <li>• light in its construction</li> </ul> <p><b>The basic operating principle of suspension systems to include:</b></p> <ul style="list-style-type: none"> <li>• support the mass of the motorcycle</li> <li>• provide the rider with a smooth ride</li> <li>• action of suspension – front forks, rear suspension</li> <li>• bump and rebound (including methods of damping)</li> <li>• ride heights and adjustments</li> </ul>	2.1, 2.2





UNIT REF: L1MV39	<b>UNIT TITLE: MOTORCYCLE BRAKING SYSTEM COMPONENTS AND MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT: 21 Hours</b>
<p><b>Overview:</b> This unit introduces learners to the principles of motorcycle braking systems, components and operation. It covers identifying the main components used in the mechanical and hydraulic systems and the purpose and function of these components. The learner also has to carry out practical routine maintenance on motorcycle braking systems.</p>		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know motorcycle braking system components	1.1 Identify the main mechanical components used in motorcycle braking systems  1.2 Identify the main hydraulic components used in motorcycle braking systems
2 Know how basic motorcycle braking systems operate	2.1 State the operating principles of mechanical motorcycle braking systems and components  2.2 State the operating principles of hydraulic motorcycle braking systems and components
3 Be able to carry out routine maintenance on motorcycle braking systems	3.1 Work safely on motorcycle braking systems  3.2 Select and use the correct technical data, tools and equipment for routine maintenance of motorcycle braking systems  3.3 Demonstrate the correct procedures when removing and replacing brake pads and brake shoes  3.4 Demonstrate the correct procedures when checking and adjusting brake adjustment mechanisms
4 Be able to clean the work area and leave in a safe condition.	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

Evidence Requirements
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and replacing brake pads
Removing and replacing brake shoes
Checking and adjusting brake adjustment mechanisms



Unit Content	Assessment Criteria
<p><b>The mechanical components in motorcycle braking systems to include:</b></p> <ul style="list-style-type: none"><li>• drum brakes – brake pedal and lever brake shoes, leading shoe, trailing shoe, adjusters, return springs, backing plate</li><li>• disc brakes – front and rear disc brake system, disc pads, brake calliper, brake disc</li></ul> <p><b>The hydraulic components in motorcycle braking systems to include:</b></p> <ul style="list-style-type: none"><li>• single line layout, master cylinder, disc brake caliper &amp; pistons, brake lines and flexible pipes</li></ul>	1.1, 1.2
<p><b>The operating principles of motorcycle braking systems to include:</b></p> <ul style="list-style-type: none"><li>• fundamental braking principles – converting kinetic energy to heat energy</li><li>• coefficient of friction – between tyres and road, between brake shoes and brake drum, brake pad and brake disc</li><li>• advantages of drum brakes and disc brakes</li><li>• action of drum brakes, leading and trailing brake shoes, self - servo action</li><li>• action of disc brakes, brake calliper, pad retraction</li><li>• terms associated with braking systems, braking efficiency, brake fade, brake balance</li></ul> <p><b>The operating principle of hydraulic braking systems to include:</b></p> <ul style="list-style-type: none"><li>• action of brake fluid – incompressible, equalising force, absorption of moisture, effect of air in system, requirement to change fluid, need to bleed system</li><li>• action of master cylinders, brake callipers, brake pad retraction</li></ul>	2.1, 2.2



<b>UNIT REF: L1MV40</b>	<b>UNIT TITLE: ROUTINE MOTORCYCLE MAINTENANCE AND SERVICE ADJUSTMENT PROCESSES</b>
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<b>Level: 1</b>	<b>GL: 18 Hours</b>	<b>TQT: 24 Hours</b>
<p><b>Overview:</b> This unit introduces learners to the principles of routine motorcycle maintenance. It requires learners to know the tools and equipment that would be used during routine motorcycle maintenance. It also covers the procedures and methods that must be used to ensure this is carried out effectively. The final outcome of the unit is concerned with the learner being able to safely and correctly carry out routine motorcycle maintenance.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know motorcycle components and systems that require routine maintenance	1.1 Identify the main components and systems found on a motorcycle that requires routine maintenance
2 Know routine maintenance requirements for motorcycle systems and components	2.1 Locate the correct and appropriate sources of: a Information b Tools c Equipment required to carry out basic motorcycle maintenance
3 Be able to carry out routine motorcycle maintenance e.g interim service	3.1 Work safely when carrying out routine motorcycle maintenance  3.2 Select and use the correct technical data, tools and equipment when carrying out basic routine maintenance of motorcycles e.g. interim service  3.3 Demonstrate the correct procedures when inspecting systems and components during basic routine motorcycle maintenance  3.4 Demonstrate the correct procedures when replacing and replenishing fluids and service items during basic routine motorcycle maintenance  3.5 Demonstrate the correct procedures when adjusting and lubricating motorcycle components and systems
4 Be able to clean the work area and leave in a safe condition.	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Carrying out basic routine motorcycle maintenance to systems and components
Replacing and replenishing fluids and service items during basic routine motorcycle maintenance
Adjusting and lubricating motorcycle components and systems



Unit Content	Assessment Criteria
<p><b>Components that require routine inspection to include:</b></p> <ul style="list-style-type: none"><li>• Tyres – wear and condition, wheels – damage, buckling</li><li>• Brakes – wear, adjustment, fluid leaks, fluid level, corrosion of pipes, condition of hoses</li><li>• Steering and suspension – wheel alignment, security of components, wear of bearings, suspension damper</li><li>• Electrical – battery, charging system, warning lamps, horn</li><li>• Lighting – function of side and rear lamps, number plate lamp, headlamps, dip and main beam control, indicators, hazard lamps, rear fog lamps</li><li>• Fluid checks – brake fluid level and condition, coolant leaks and level, oil leaks and level, battery</li><li>• Transmission – clutch operation and adjustment, tensions, drive shafts, joints, rubber boots, fluid leaks</li><li>• Motorcycle bodywork - paintwork, seat, wing mirror condition, security of components and panels</li><li>• Rider controls – brake, clutch and throttle operation and adjustment, warning lamps, switch operation, centre and side stand, steering stops</li><li>• Component security – frame attachments, fasteners for main suspension, steering and braking systems</li></ul>	1.1
<p><b>Information, tools and equipment to include:</b></p> <ul style="list-style-type: none"><li>• Motorcycle specifications and data, motorcycle manufacturer’s inspection requirements, motorcycle manuals, motorcycle inspection check lists, motorcycle lift and stands, wheel alignment, spanners and sockets, torque wrench, carburettor balance equipment, screwdrivers, levers and bars, inspection lamps, tyre tread depth indicator, measurement tools</li></ul>	2.1



<b>UNIT REF: L1MV41</b>	<b>UNIT TITLE: MOTORCYCLE WHEEL AND TYRE CONSTRUCTION AND MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 16 Hours</b>	<b>TQT: 21 Hours</b>
<p><b>Overview:</b> This unit introduces learners to road wheels and tyres and their routine maintenance requirements. It includes identifying the construction of road wheels and tyres and the applications to different types of motorcycle. The unit also covers road wheel and tyre terminology, tyre markings, legal requirements and the procedures for replacing standard tyres.</p>		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know how wheel and tyres are constructed	1.1 Identify the types of tyre used on common road motorcycles 1.2 Identify the construction of radial and cross ply tyres 1.3 Identify the types of wheel used on road motorcycles
2 Know wheel and tyre terminology	2.1 Give examples of the markings and terminology associated with motorcycle wheels and tyres
3 Be able to carry out routine maintenance and replacement of road wheels and tyres	3.1 Work safely when working with road wheels and tyres 3.2 Select and use the correct technical data, tools and equipment for maintaining wheels and tyres 3.3 Demonstrate the correct procedures to remove and refit a road wheel to a motorcycle 3.4 Demonstrate correct procedures to remove and refit a tubed tyre to a road wheel 3.5 Demonstrate correct procedures to balance a wheel and tyre to within acceptable tolerances 3.6 Demonstrate the correct method to check a tyres suitability and legality for fitment to a motorcycle
4 Be able to clean the work area and leave in a safe condition.	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

Evidence Requirements
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and refitting a road wheel to a motorcycle
Removing and refitting a tubed tyre to a road wheel
Balancing a wheel and tyre to within acceptable tolerances
Checking a tyres suitability and legality for fitment to a motorcycle



Unit Content	Assessment Criteria
<p><b>The common types of tyre used on road vehicles to include:</b></p> <ul style="list-style-type: none"><li>• Radial ply tyre, cross ply, tube type tyres, tubeless tyres</li></ul> <p><b>The main construction details of radial and cross ply tyres to include:</b></p> <ul style="list-style-type: none"><li>• casing plies - the arrangement for cross ply and radial designs</li><li>• tyre tread – types and applications for car, motorcycle, truck, caravans, trailers, specialist vehicles, on-road and off-road tyres</li><li>• tread depth indicator</li><li>• tyre bead, tread bracing, tyre sidewall</li></ul> <p><b>The common types of wheel used on road motorcycles to include:</b></p> <ul style="list-style-type: none"><li>• alloy wheels, pressed steel wheels, spoked wheels</li></ul>	1.1, 1.2, 1.3
<p><b>The markings and terminology associated with motorcycle wheels and tyres to include:</b></p> <ul style="list-style-type: none"><li>• tyre type marking, tyre and wheel diameter, tyre section width, tread depth, tyre aspect ratio, speed rating, load index</li></ul>	2.1



UNIT REF: L1MV42	<b>UNIT TITLE: MOTORCYCLE EXHAUST SYSTEM COMPONENTS AND MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 16 Hours</b>	<b>TQT: 21 Hours</b>
<b>Overview:</b> This unit introduces learners to the fundamental principles of motorcycle exhaust systems. It requires learners to know how to work safely when removing and refitting exhaust systems and includes the identification of the main components		

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know exhaust systems components	1.1 Identify the components used in modern motorcycle exhaust systems  1.2 State the purpose of each major part of the exhaust system  1.3 State the correct sequence and procedure for removing and refitting a motorcycle exhaust system and components
2 Know how exhaust systems operate	2.1 State the operating principles of exhaust systems and components
3 Be able to remove and refit exhaust systems	3.1. Work safely on motorcycle exhaust systems  3.2 Select and use the appropriate technical data, tools and equipment for routine exhaust maintenance  3.3 Demonstrate the correct sequence and procedure for removing and refitting a complete motorcycle exhaust system and components
4 Be able to clean the work area and leave in a safe condition.	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

Evidence Requirements
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and refitting a complete motorcycle exhaust system and components



Unit Content	Assessment Criteria
<p><b>The components used in motorcycle exhaust systems to identify include:</b></p> <ul style="list-style-type: none"><li>• Materials – steel, stainless steel, exhaust downpipe, lambda sensor, silencer, catalytic converter, exhaust system brackets, exhaust system joints and gaskets</li></ul> <p><b>The purpose of exhaust components in motorcycle exhaust systems could include:</b></p> <ul style="list-style-type: none"><li>• Exhaust downpipe, lambda sensor, silencer, catalytic converter, exhaust system bracket, exhaust system joints and gaskets</li></ul> <p><b>Correct sequence and procedure to include:</b></p> <ul style="list-style-type: none"><li>• PPE</li><li>• waiting for components to cool</li><li>• correct sequence for given motorcycle</li><li>• ventilation when engine running</li><li>• checking for leaks</li><li>• checking for correct alignment</li></ul>	1.1, 1.2, 1.3
<p><b>Basic operation of exhaust systems include:</b></p> <ul style="list-style-type: none"><li>• Noise reduction</li><li>• Reduce engine exhaust emissions</li><li>• Noise regulations</li><li>• Service needs</li></ul>	2.1





<b>UNIT REF: L1MV43</b>	<b>UNIT TITLE: MOTORCYCLE DRIVELINE MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 21 Hours</b>	<b>TQT: 28 Hours</b>
<p><b>Overview:</b> This unit introduces the learner to motorcycle transmission systems and covers the basic identification of the major items of the unit and their function. It also allows the learner to use workshop manuals to locate specific data.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know about motorcycle drivelines	1.1 Identify the range of units that make up the motorcycle driveline assembly 1.2 Locate motorcycle driveline components
2 Know about motorcycle gearboxes	2.1 State the purpose of the gearbox 2.2 Identify a range of components from a selection of simple manual gearbox and clutch parts
3 Be able to carry out routine maintenance on motorcycle drivelines	3.1 Work safely on motorcycle driveline systems 3.2 Select and use appropriate technical data, tools and equipment for routine driveline maintenance 3.3 Demonstrate the correct procedures to check and top up the levels in a manual change motorcycle gearbox 3.4 Demonstrate the correct procedures to check and top up the levels in a shaft drive assembly 3.5 Demonstrate the correct procedures to remove and refit a clutch assembly to a manual change motorcycle gearbox (engine removed)
4 Be able to clean the work area and leave in a safe condition.	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Checking and topping up the levels in a manual change gearbox
Checking and topping up the levels in a shaft drive assembly
Removing and refitting a clutch to a manual change gearbox (engine removed)

<b>Unit Content</b>	<b>Assessment Criteria</b>
<p><b>The motorcycle transmission layouts to include:</b></p> <ul style="list-style-type: none"> <li>engine, clutch, gearbox, chain and sprockets, driveshaft, drive belt, CVT</li> </ul> <p><b>Locate the drive line components of motorcycle transmission systems</b></p> <ul style="list-style-type: none"> <li>engine, clutch, gearbox, driveshaft, final drive, drive belt, chain and sprockets, CVT</li> </ul>	1.1, 1.2
<p><b>The purpose of the gearbox to include:</b></p> <ul style="list-style-type: none"> <li>provide permanent neutral, increase torque, allow motorcycle to accelerate, allow motorcycle to reach suitable top speed</li> </ul> <p><b>The main components of a manual gearbox and clutch to include:</b></p> <ul style="list-style-type: none"> <li>clutch plate, pressure plate, springs, thrust bearing, casing, gears, selector forks and drum</li> </ul>	2.1, 2.2



<b>UNIT REF: L1MV44</b>	<b>UNIT TITLE: MOTORCYCLE FUEL SYSTEM MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 21 Hours</b>	<b>TQT: 29 Hours</b>
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**Overview:** This unit provides the candidate with an introduction to the knowledge and skills in motorcycle fuel system components, their operation and associated maintenance tasks.

LEARNING OUTCOMES	ASSESSMENT CRITERIA
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know about the hazards connected with working on motorcycle fuel systems.	1.1 Know the hazards associated with motorcycle fuel systems 1.2 State the safety precautions to be taken when working on motorcycle fuel systems
2 Know the main components of motorcycle fuel systems.	2.1 Identify the main components used in the fuel system 2.2 State the functions of the main components
3 Know how to complete inspection and maintenance checks on motorcycle system components.	3.1 State how to remove, inspect and replace fuel system components: fuel filter, carburettor or fuel injector 3.2 State how to check and adjust engine idle speed and air/fuel mixture
4 Be able to remove, inspect and replace motorcycle fuel system components.	4.1 Work safely on motorcycle fuel systems 4.2 Select and use appropriate technical data, tools and equipment for fuel system maintenance 4.3 Demonstrate how to remove, inspect and replace fuel system components to include: a fuel filter b carburettor or fuel injector. 4.4 Demonstrate how to check and adjust engine idle and air fuel mixture
5 Be able to clean the work area and leave in a safe condition	5.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

Evidence Requirements
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing, inspecting and replacing a fuel filter
Removing, inspecting and replacing a carburettor <b>or</b> fuel injector
Checking engine idle speed and air / fuel mixture



Unit Content	Assessment Criteria
<p><b>Hazards associated with fuel systems</b></p> <ul style="list-style-type: none"> <li>• Fire risks due to flammable vapours / liquids, safe systems of work</li> <li>• Inhaling fumes from fuels, ensure fuel containers are sealed</li> <li>• Skin irritation / diseases from contact with fuels, correct use of PPE</li> <li>• Inhalation of harmful exhaust gases, suitable use of exhaust extraction</li> </ul> <p><b>Safety precautions to follow include:</b></p> <ul style="list-style-type: none"> <li>• Safe conduct of individuals in workshops</li> <li>• Correct use of PPE</li> <li>• Use tools and equipment in correct manor</li> <li>• Report defects in tools and equipment to appropriate person</li> <li>• Follow COSHH instructions and guidance</li> </ul>	<p>1.1, 1.2</p>
<p><b>The main components of the fuel system are:</b></p> <ul style="list-style-type: none"> <li>• Fuel</li> <li>• Fuel tank</li> <li>• Fuel tap</li> <li>• Fuel pipes and filters</li> <li>• Carburettor system main components</li> <li>• Fuel injection system main components</li> <li>• Air filter and housing</li> <li>• Throttle twist grip</li> </ul> <p><b>The function of the main fuel system components are:</b></p> <ul style="list-style-type: none"> <li>• Fuel: hydrocarbon fuels over view.</li> <li>• Fuel tank: safe storage of fuel.</li> <li>• Fuel tap: on / off / reserve, filter.</li> <li>• Fuel pipes and filter: connects fuel tank to carburettor, removes dirt particles from the fuel.</li> <li>• Carburettor system: throttle slide and needle, mixing and float chambers, jets, adjustment screws, choke system</li> <li>• Injector system: injector, regulator, pump, temperature and position sensors, ECU, idle speed control.</li> <li>• Air filter and housing: removes dirt particles from the air, acts as a silencer.</li> <li>• Throttle twist grip: provides the rider a method of regulating the engines power.</li> </ul>	<p>2.1, 2.2</p>
<p><b>Removal, inspection and replacement of fuel system components: fuel filter, carburettor or fuel injector to include:</b></p> <ul style="list-style-type: none"> <li>• Use of technical data to support replacement and adjustments</li> <li>• Appropriate use of tools and equipment for replacement and adjustments</li> <li>• Appropriate engine conditions for the replacements and adjustments of fuel systems</li> <li>• Safe systems of work</li> <li>• Appropriate methods to check and adjust engine speeds and fuel mixtures</li> </ul>	<p>3.1, 3.2</p>



<b>UNIT REF: L1MV45</b>	<b>UNIT TITLE: MOTORCYCLE SPARK IGNITION SYSTEM MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 15 Hours</b>	<b>TQT: 21 Hours</b>
<b>Overview:</b> This unit provides the candidate with an introduction to the knowledge and skills in motorcycle spark ignition system components, their operation and associated maintenance tasks.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know about the hazards connected with working on motorcycle spark ignition systems	1.1 State the hazards associated with working on spark ignition systems
2 Know the main components of motorcycle spark ignition systems.	2.1 Identify the main components used in the spark ignition system
3 Know how spark ignition systems operate	2.2 State the functions of the main components
4 Know how to complete inspection checks on motorcycle spark ignition system components.	3.1 State the operating principles of spark ignition systems
5 Be able to remove, inspect and replace motorcycle spark ignition system components.	4.1 State how to remove, inspect and replace spark ignition system components: spark plug, HT lead and ignition coil
	4.2 State how to check and adjust the ignition timing
	5.1 Work safely when carrying out spark ignition system maintenance
	5.2 Select and use appropriate technical data, tools and equipment for spark ignition system maintenance
	5.3 Demonstrate how to remove, inspect and replace spark ignition system components: spark plug, HT lead and ignition coil
	5.4 Demonstrate how to check and adjust the ignition timing
6 Be able to clean the work area and leave in a safe condition	6.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing, inspecting, cleaning, adjusting and replacing a spark plug
Removing, inspecting and replacing a High Tension (HT) lead: <b>(includes recording resistances)</b>
Removing, inspecting and replacing an ignition coil: <b>(includes recording primary and secondary coil resistances)</b>
Checking and adjusting (if possible) the ignition timing

Unit Content	Assessment Criteria
<p><b>Hazards associated with spark ignition systems include:</b></p> <ul style="list-style-type: none"> <li>• Electric shocks due to high voltages, working safely around live circuits</li> <li>• Risk of battery acid burns, appropriate use of PPE</li> <li>• Explosion due to battery fumes, safe systems of work.</li> <li>• Fire risks due to ignition of flammable vapours / liquids, safe systems of work</li> <li>• Inhaling fumes from fuels, ensure fuel containers are sealed.</li> </ul>	1.1
<p><b>The main components of the ignition system include:</b></p> <ul style="list-style-type: none"> <li>• Battery</li> <li>• Ignition switch</li> <li>• Ignition coil</li> <li>• Spark plug</li> <li>• Condenser</li> <li>• Contact breaker (C/B) points system</li> <li>• Electronic ignition system – including CDI</li> </ul> <p><b>The function of the main ignition system components include:</b></p> <ul style="list-style-type: none"> <li>• Battery: storage of electrical energy</li> <li>• Ignition switch: turn on/off the electrical supply fro ignition system components</li> <li>• Ignition coil: converts low voltage to a high voltage by mutual induction, produces high voltages required by the spark plug</li> <li>• Spark plug: ignites the fuel/air mixture in the engines combustion chamber</li> <li>• Contact breaker points: opens and closes switching on and off the ignition coil</li> <li>• Condenser: stores small amounts of electrical energy to assist in the collapse of the ignition coils magnetic field.</li> <li>• Provide an overview of the differences in components and operation between CB and electronic ignition systems.</li> </ul>	2.1, 2.2
<p><b>The principles of modern breaker-less ignition systems</b></p> <ul style="list-style-type: none"> <li>• creation of magnetic field</li> <li>• electro-magnetic induction</li> <li>• coil operation</li> <li>• primary and secondary windings</li> <li>• production of high voltage by breaking LT circuit</li> <li>• layout of components in a typical breaker-less ignition system.</li> <li>• function of the following components: battery, ignition coil, ignition switch, electronic trigger systems (simple concept of different types), capacitor, spark plugs, HT lead.</li> <li>• basic operation of a typical breaker-less ignition circuit.</li> <li>• basic principle of ignition timing.</li> </ul>	3.1
<p><b>Basic inspection checks on spark ignition components:</b></p> <ul style="list-style-type: none"> <li>• Battery: state of charge, electrolyte levels and density, security and connection</li> <li>• Ignition switch: switches components on / off</li> <li>• Ignition coil: security, insulation and resistances</li> <li>• Spark plug: visual inspection, colour of insulator for mixture strength, electrode gap</li> <li>• Contact breaker: gap and condition of contacts, ignition timing</li> <li>• Ignition timing</li> </ul>	4.1, 4.2



<b>UNIT REF: L1MV47</b>	<b>UNIT TITLE: ELECTRICAL FOUNDATION SKILLS</b>
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<b>Level: 1</b>	<b>GL: 21 Hours</b>	<b>TQT: 29 Hours</b>
<p><b>Overview:</b> This unit introduces learners to the principles of vehicle electrical systems, components and operation. It covers identifying the main components used in vehicle systems and the main electrical principles and terminology. The unit also introduces learners to the fundamental operating principles of vehicle electrical systems and components. Learning outcome 3 requires the learner to be able to interpret simple electrical circuits and to create their own simple vehicle lighting circuit.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Know about vehicle electrical systems and electrical principles	1.1. Identify the main electrical systems and components on a modern vehicle 1.2. Outline simple vehicle electrical component operational principles and laws 1.3. State the main electrical units of measurement 1.4. Identify common electrical symbols
2. Be able to make simple electrical circuits	2.1. Work safely whilst constructing vehicle electric lighting circuits 2.2. Select and use the correct tools, equipment, cable size and fuse to construct a vehicle lighting circuit. 2.3. Demonstrate the ability to accurately read and interpret a simple wiring diagram 2.4. Demonstrate the correct procedures to make a simple 12 volt lighting circuit using cable, switches, fuses, a relay and bulbs 2.5. Demonstrate the correct use of a voltmeter when checking electrical circuit operation
3. Be able to clean the work area and leave in it a safe condition	3.1. Use appropriate equipment and methods to clean the work area and leave in a safe condition

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one occasion:</b>
Working safely whilst constructing vehicle electric lighting circuits
Selecting and use the correct tools, equipment, cable size and fuse to construct a vehicle lighting circuit.
Accurately reading and interpreting a simple wiring diagram.
Making a simple 12 volt lighting circuit using cable, switches, fuses, a relay and bulbs
Correctly using a voltmeter to check electrical circuit operation



Unit Content	Assessment Criteria
<p><b>The electrical systems include:</b></p> <ul style="list-style-type: none"><li>• charging system – alternator, battery</li><li>• starting system – battery, starter</li><li>• lighting system – side and rear lamps, headlamps, stop lamps, fog lamps, indicators, hazard lamps</li><li>• auxiliary systems – front and rear windscreen wipers, windscreen heater, horn, central door locking, immobiliser</li><li>• in car entertainment – radio, CD player</li></ul> <p><b>Electrical principles and terminology include:</b></p> <ul style="list-style-type: none"><li>• magnet effect of electrical current – application to motors and generators</li><li>• heating effect of electrical current – application to lamps, windscreen heater</li><li>• chemical effect – storage and discharge of electrical energy by the battery</li><li>• types of circuit – series and parallel</li><li>• ratings of bulbs, lamps and fuses</li></ul> <p><b>Electrical units to include:</b></p> <ul style="list-style-type: none"><li>• volt</li><li>• ampere</li><li>• ohm</li><li>• watt</li></ul> <p><b>Common electrical symbols to include:</b></p> <ul style="list-style-type: none"><li>• battery</li><li>• switches</li><li>• motors</li><li>• fuses</li><li>• lamps</li><li>• earth</li><li>• diode</li><li>• transistor</li><li>• relay</li></ul>	1.1-1.4



<b>UNIT REF: L1MV48</b>	<b>UNIT TITLE: LIGHTING SYSTEM MAINTENANCE</b>
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<b>Level: 1</b>	<b>GL: 20 Hours</b>	<b>TQT: 30 Hours</b>
<p><b>Overview:</b> This unit introduces learners to the principles of vehicle lighting systems, components and operation. It covers identifying the main components used in vehicle lighting systems. The unit also introduces learners to the fundamental operating principles of vehicle lighting systems and components. Learners also have to complete. Learners are also to complete practical activities by replacing a range of vehicle lighting circuit components and aligning a vehicle headlamp.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know vehicle lighting systems components	1.1 Identify the main types of bulbs used on modern vehicles 1.2 Identify examples of the types of headlamp units available 1.3 State the colour of lamps that are legally required on a 4 wheeled vehicle
2 Know how vehicle lighting systems operate	2.1 Interpret a simple lighting circuit wiring diagram 2.2 State how light is emitted from a conventional bulb 2.3 State how a brake light circuit operates
3 Be able to replace lighting system components	3.1 Work safely on vehicle lighting systems 3.2 Demonstrate the correct method to replace a halogen headlamp bulb 3.3 Demonstrate the correct method to replace a headlamp unit 3.4 Demonstrate the correct method to align a headlamp to within legal requirements 3.5 Use a wiring diagram to locate the main beam light circuit relay and check its operation
4 Be able to clean the work area and leave in it a safe condition	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and replacing a halogen headlamp bulb
Removing and replacing a head lamp unit including realignment to legal requirements
Checking the operation of the main beam light circuit relay





Unit Content	Assessment Criteria
<p><b>The main types of bulbs used on modern vehicles include:</b></p> <ul style="list-style-type: none"><li>• conventional- vacuum, inert</li><li>• Halogen</li><li>• HID - Xenon</li><li>• LED</li></ul> <p><b>Examples of the types of headlamp units available include:</b></p> <ul style="list-style-type: none"><li>• low beam units</li><li>• high beam units</li><li>• combined units</li><li>• European lens</li><li>• American lens</li><li>• projector type</li><li>• HID-xenon</li><li>• LED unit</li></ul> <p><b>The colour of lamps that are legally required on a 4 wheeled vehicle include:</b></p> <ul style="list-style-type: none"><li>• headlamp</li><li>• sidelamp</li><li>• indicators</li><li>• brakelights</li><li>• rear lamps</li><li>• reverse lamps</li><li>• fog lamps</li><li>• white</li><li>• amber</li><li>• red</li><li>• yellow</li></ul>	1.1, 1.2, 1.3
<p><b>The ability to accurately read and interpret a simple lighting circuit wiring diagram to include:</b></p> <ul style="list-style-type: none"><li>• battery symbols</li><li>• switch symbols</li><li>• wire colours</li><li>• fuse symbols</li><li>• lamp symbols</li><li>• earth symbols</li><li>• relay symbols</li></ul> <p><b>How light is emitted from a conventional bulb to include:</b></p> <ul style="list-style-type: none"><li>• conversion of electrical energy to heat energy</li><li>• filament temperature</li></ul> <p><b>How a main beam light circuit operates to include</b></p> <ul style="list-style-type: none"><li>• power and earth connections</li><li>• switch</li><li>• fuse</li><li>• lamp units</li></ul>	2.1, 2.2, 2.3



<b>UNIT REF: L1MV80</b>	<b>UNIT TITLE: REMOVE AND REPLACE A CYCLE GEAR ASSEMBLY</b>
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<b>Level: 1</b>	<b>GL: 8 Hours</b>	<b>TQT: 12 Hours</b>
<b>Overview:</b> The aim of this unit is to provide the learner with the skills and knowledge required to remove and replace the front and rear gear assembly of a cycle.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know how cycle gearing assembly systems are constructed	1.1 Identify the main components used in cycle gear assembly systems  1.2 State the purpose of the main components used in cycle gear assembly systems
2 Know how cycle gear assembly systems operate	2.1 State the operating principles of cycle gear assembly systems and components  2.2 Identify the procedures for setting up a gear assembly for correct operation
3 Be able to carry out the removal and replacement of a front and rear gear assembly	3.1 Work safely when working with cycle gear assembly systems  3.2 Select and use appropriate technical data, tools and equipment for the removal and replacement of a front and rear gear assembly  3.3 Demonstrate how to carry out the removal and replacement of a front and rear gear assembly  3.4 Demonstrate the procedure for setting up a front and rear gear assembly for correct operation
4 Be able to clean the work area and leave in a safe condition.	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Removing and replacing a front and rear cycle gear assembly
Setting up a front and rear gear assembly for correct operation



Unit Content	Assessment Criteria
<p><b>The main components in a gear assembly system to be removed and replaced to include:</b></p> <ul style="list-style-type: none"><li>• front and rear gear sets</li><li>• correct chain for gear sets</li><li>• front and rear derailleurs types - component parts - cage, jockey / guide pulley, tension pulley, spring tension, adjustment screws, bearings</li><li>• gear shifter types - Index, friction, combined brake and gear, trigger, twist – movement of the gear shifter lever pulls or releases the Bowden cable on the derailleur</li><li>• bowden cables</li></ul> <p><b>Purpose of the gear assembly system to include:</b></p> <ul style="list-style-type: none"><li>• Front and rear gear sets, correct chain for gear sets, front and rear derailleurs, gear shifters, Bowden cables</li></ul>	1.1, 1.2
<p><b>The operating principles of cycle gear assembly systems to include:</b></p> <ul style="list-style-type: none"><li>• Selection of various gears to provide increase / decrease of torque, speed and cadence</li><li>• identifying functions of high and low limit screws, b-tension adjuster, barrel adjuster</li><li>• derailleurs moving chain between gear sets, chain tension, positioning of derailleurs</li><li>• compatible of components - compatibility of components before mixing, not all components are interchangeable particularly between different models and manufacturers</li></ul> <p><b>Procedures for setting up a gear assembly for correct operation to include:</b></p> <ul style="list-style-type: none"><li>• identifying cycle gearing manufacturers components</li><li>• obtaining and using technical information to support cycle gear set up</li><li>• using the correct procedure and following manufacturers information to adjust high and low settings of derailleur mechanisms</li><li>• checking for the correct operation on completion of adjustment</li></ul>	2.1, 2.2



<b>UNIT REF: L1MV81</b>	<b>UNIT TITLE: CARRY OUT A SYSTEMATIC CYCLE CHECK</b>
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<b>Level: 1</b>	<b>GL: 4 Hours</b>	<b>TQT: 8 Hours</b>
<p><b>Overview:</b> This unit introduces learners to the principles of carrying out a systematic cycle check. It requires learners to know the tools and equipment that would be used during a systematic cycle check. It also covers the procedures and methods that must be used to ensure this is carried out effectively.</p>		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know cycle components and systems that require a systematic check, basic adjustments and lubrication	1.1 Identify the main components and systems found on a cycle that requires a systematic cycle check, basic adjustments and lubrication
2 Know how to complete routine systematic cycle check, basic adjustment and lubrication	2.1 State how to carryout routine systematic cycle checks, basic adjustments and lubrication.
3 Be able to carry out a systematic cycle check and basic adjustments	3.1 Work safely when carrying out a systematic cycle check, basic adjustments and lubrication  3.2 Select and use the correct technical data, tools and equipment when carrying out a systematic cycle check, basic adjustments and lubrication  3.3 Demonstrate the correct procedures for carrying out a systematic cycle check  3.4 Demonstrate the correct procedures when adjusting and lubricating cycle components and systems
4 Be able to clean the work area and leave in a safe condition.	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Carrying out a systematic cycle check
Carrying out adjustments and lubrication of cycle components and systems



Unit Content	Assessment Criteria
<p><b>Components that require routine inspection to include:</b></p> <ul style="list-style-type: none"><li>• Tyres – wear and condition, wheels – damage, buckling</li><li>• Brakes – wear, adjustment, fluid leaks, fluid level, condition of hoses</li><li>• Steering and suspension – wheel alignment, security of components, wear of bearings, suspension damper</li><li>• Lighting – function of front and rear lamps</li><li>• Cycle framework - paintwork, seat, mirror condition, security of components and systems</li><li>• Rider controls – front and rear brakes, steering, side stand</li><li>• Component security – frame attachments, fasteners for main steering and braking systems</li></ul>	1.1
<p><b>Systematic cycle checks, basic adjustment and lubrication to include the use of: Information</b></p> <ul style="list-style-type: none"><li>• Cycle specifications and data, cycle manufacturer’s inspection requirements, cycle manuals, cycle inspection check lists</li></ul> <p><b>Tools and equipment</b></p> <ul style="list-style-type: none"><li>• cycle stands, wheel alignment tools, spanners and sockets, torque wrench, screwdrivers, levers, inspection lamps, tyre pressure gauge, measurement tools</li></ul> <p><b>Adjustments and lubrication</b></p> <ul style="list-style-type: none"><li>• clearances</li><li>• tensions</li><li>• pressures</li><li>• alignment</li><li>• settings</li><li>• selection of correct lubricant</li><li>• correct component and location requiring lubricant</li></ul>	2.1



<b>UNIT REF: L1MV82</b>	<b>UNIT TITLE: REPAIR A CYCLE PUNCTURE</b>
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<b>Level: 1</b>	<b>GL: 4 Hours</b>	<b>TQT: 8 Hours</b>
<b>Overview:</b> This unit provides the learner with the skills and knowledge required to repair a puncture on a cycle rear wheel.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1. Know how cycle wheel rims, tyres and inner tube are constructed	1.1 Identify the types of tyre used on cycles 1.2 Identify the construction of inner tubes 1.3 Identify the types of wheel rims used on cycles
2. Know wheel, tyre and inner tube terminology	2.1 Give examples of the markings and terminology associated with cycle wheels, tyres and inner tubes
3 Know how to repair cycle punctures	3.1 Identify the processes in carrying out a repair to a cycle puncture in the rear wheel 3.2 Give examples of the different causes of punctures
4 Be able to carry out the repair of a cycle puncture on a rear wheel	4.1. Work safely when repairing a cycle puncture on a rear wheel 4.2 Select and use technical data, tools and equipment to carry out a repair to a cycle rear wheel 4.3. Demonstrate the correct procedures to carry out the repair of a puncture on a rear wheel 4.4. Demonstrate correct procedures to locate and identify the cause of the puncture
5 Be able to clean the work area and leave in a safe condition.	5.1. Use appropriate equipment and methods to clean the work area and leave in a safe condition.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Carrying out the repair of a puncture on a rear wheel
Locating and identifying the cause of the puncture



Unit Content	Assessment Criteria
<p><b>The common types of tyre used on cycles to include:</b></p> <ul style="list-style-type: none"><li>• street, road, trail, BMX, tube type tyres, tubeless tyres</li><li>• casing plies - the arrangement of plies</li><li>• tyre tread – types and applications for road, MTB, BMX, street</li><li>• tread depth indicator</li><li>• tyre bead, tread bracing, tyre sidewall</li></ul> <p><b>Construction of inner tubes to include:</b></p> <ul style="list-style-type: none"><li>• Butyl, latex, anti-puncture types and liquids, Valve types - Schrader, Presta, Woods/Dunlop</li></ul> <p><b>Types of wheel rims used on cycles to include:</b></p> <ul style="list-style-type: none"><li>• Carbon, alloy and steel materials. Rim profiles. Tube and tubeless types</li></ul>	1.1, 1.2, 1.3
<p><b>The markings and terminology associated with cycle wheels, tyres and inner tubes to include:</b></p> <ul style="list-style-type: none"><li>• Wheel, tyre and inner tube markings - wheel diameter (metric and imperial) , tyre section width, tyre height, circumference, tread depth</li><li>• ISO 5775</li></ul>	2.1
<p><b>Processes in carrying out a repair to a cycle puncture in the rear wheel to include:</b></p> <ul style="list-style-type: none"><li>• secure positioning of cycle and stands, correct selection of tools and equipment for removal of wheel, removal of tyre and inner tube, locating and repairing inner tube with suitable patch, refitting wheel, wheel alignment, wheel nut torque setting, use of torque wrench</li></ul> <p><b>Examples of the different causes of punctures to include:</b></p> <ul style="list-style-type: none"><li>• penetration by foreign body – thorn, nail or glass impact puncture – due to low inflation , sharp edges, potholes</li></ul>	3.1, 3.2



<b>UNIT REF: L1MV83</b>	<b>UNIT TITLE: REMOVE AND REPLACE A CYCLE RIM BRAKE ASSEMBLY</b>
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<b>Level: 1</b>	<b>GL: 6 Hours</b>	<b>TQT: 11 Hours</b>
<b>Overview:</b> The aim of this unit is to provide the learner with the skills and knowledge required to remove and replace a cable operated rim brake assembly.		

<b>LEARNING OUTCOMES</b>	<b>ASSESSMENT CRITERIA</b>
<b>The Learner will:</b>	<b>The Learner can:</b>
1 Know how cycle rim brake systems are constructed	1.1 Identify the main components used in cycle rim brake assemblies 1.2 State the purpose of the main components used in cycle rim brake assemblies
2 Know how cycle rim brakes operate	2.1 State the operating principles of cycle rim brake components
3 Be able to carry out the removal and replacement of a cable operated rim brake assembly	3.1 Work safely when removing and replacing a cable operated rim brake assembly 3.2 Select and use appropriate technical data, tools and equipment to carry out the removal and replacement of cable operated rim brake assembly 3.3 Demonstrate how to carry out the removal and replacement of a cable operated rim brake assembly 3.4 Demonstrate the correct procedure for setting up a cable operated rim brake assembly
4 Be able to clean the work area and leave in a safe condition.	4.1 Use appropriate equipment and methods to clean the work area and leave in a safe condition.

<b>Evidence Requirements</b>
You <b>must be observed by your assessor</b> completing <b>all</b> of the activities listed below on <b>at least one</b> occasion:
Carrying out the removal and replacement of a cable operated rim brake assembly
Using the correct procedure to set up a cycle rim brake assembly

<b>Unit Content</b>	<b>Assessment Criteria</b>
<b>The main components in a cycle rim brake assembly to be removed and replaced to include:</b> <ul style="list-style-type: none"> <li>• Brake - blocks, levers, callipers</li> </ul> <b>Purpose of the cycle rim brake assembly to include:</b> <ul style="list-style-type: none"> <li>• Front and rear brake levers, Bowden cables, wheel rim, Calliper types - cantilever, V, centre pull, side pull</li> </ul>	1.1, 1.2
<b>The operating principles of cycle rim brake assemblies to include:</b> <ul style="list-style-type: none"> <li>• Mechanical leverage, kinetic energy in to heat, friction between tyre and road surface</li> <li>• Levers, inner and outer cables, calliper, brake blocks, calliper balancing screw, brake block wear indicator, mechanical and heat energies</li> </ul>	2.1