

## CORE UNITS OF LEARNING

### PERFORMING VEHICLE BASIC MAINTENANCE

**UNIT CODE: ENG/CU/AUT/CR/1/6**

#### **Relationship to Occupational Standards**

*This unit addresses the unit of competency and meets the requirements specified by the Occupational Standards: **Perform vehicle basic maintenance.***

**Duration of Unit:** 120hours

#### **Unit description**

This unit specifies the competencies required to perform vehicle basic maintenance. It involves assessing vehicle mechanical and operational condition, carrying out diagnosis tests, replacing service parts, replenishing fluids and lubrications, conducting tests and complete the procedure.

#### **Summary of Learning Outcomes**

1. Assess vehicle mechanical and operational condition
2. Carry out diagnostic tests
3. Service vehicle lubrication system
4. Replenish fluids and lubricants
5. Replace/service vehicle service parts
6. Conduct road tests
7. Carry out adjustments to vehicle components and systems
8. Service Vehicle Wheels and Tyres 9. Finalize service and repair procedures.

#### **Learning Outcomes, Content and Suggested Assessment Methods**

| <b>Learning Outcome</b>                                 | <b>Content</b>   | <b>Suggested Assessment Methods</b>  |
|---|--|--|
| 1. Assess vehicle mechanical and operational condition. | <ul style="list-style-type: none"> <li>• Preparing periodic maintenance schedule</li> <li>• Preparing work area</li> <li>• Assessment methods</li> <li>• OSHA 2007</li> <li>• Conducive working environment e.g. appropriate ventilations, free from fumes and poisonous gases</li> <li>• use of personal protective equipment and clothing</li> </ul> | <ul style="list-style-type: none"> <li>• Observation</li> <li>• Written</li> <li>• Oral</li> </ul> |

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|  | <p>(PPE)</p> <ul style="list-style-type: none"> <li>• selection and use of appropriate tools and equipment</li> <li>• use of protective covering to prevent damage to vehicles</li> <li>• Draining and disposal of used oils</li> <li>• Disposing of scrap components</li> <li>• Preparing mechanical and operational assessment report</li> </ul> |  |
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| <b>Learning Outcome</b>               | <b>Content</b>   | <b>Suggested Assessment Methods</b>   |
|---------------------------------------|--|---|
| 2. Carry out diagnostic tests.        | <input type="checkbox"/> Identifying sources of technical information and regulations<br>Identifying vehicle system codes<br><input type="checkbox"/> Assessing condition and performance of the vehicle system<br><input type="checkbox"/> Identifying defects using diagnostic equipment Adhering to manufacturers' specifications and guidelines<br><input type="checkbox"/> Proper use of diagnostic machine in the vehicle Adhering to agreed timescales and completion times<br><input type="checkbox"/> Keeping customers informed of progress<br>Preparing diagnostic assessment report<br>Maintenance<br><input type="checkbox"/> documentation and records<br><br><input type="checkbox"/><br><br><input type="checkbox"/><br><br><input type="checkbox"/> | <input type="checkbox"/> Observation<br><input type="checkbox"/> Written<br><input type="checkbox"/> Oral   |
| 3. Service vehicle lubrication system | <input type="checkbox"/> Diagnosing vehicle lubrication system<br>Replacing Engine<br><input type="checkbox"/>   | <input type="checkbox"/> Practical<br><input type="checkbox"/> Oral<br><input type="checkbox"/> Observation |

| Learning Outcome                    | Content  | Suggested Assessment Methods   |
|-------------------------------------|--|--|
|                                     | transmission and hydraulic filters<br>Greasing vehicle components<br><input type="checkbox"/> Testing lubrication system pressure<br><input type="checkbox"/>  | <input type="checkbox"/> Written   |
| 4. Replenish fluids and lubricants. | <input type="checkbox"/> Identification and selection of appropriate tools, equipment, vehicle and personal protective equipment;<br>Assessment methods used to check for vehicle conformity;<br><input type="checkbox"/> Identification of the different systems to be inspected including:<br><input type="checkbox"/> Engine<br><input type="checkbox"/> Chassis<br><input type="checkbox"/> Brakes<br><input type="checkbox"/> Wheels and tyres<br><input type="checkbox"/> Steering and suspension<br><input type="checkbox"/> Transmission and driveline<br><input type="checkbox"/> Electrical and electronics<br><input type="checkbox"/> Exterior vehicle body<br><input type="checkbox"/> Vehicle interior Use of<br><input type="checkbox"/> approved inspection checklists and<br><input type="checkbox"/><br><input type="checkbox"/> | <input type="checkbox"/> Practical exercises with observation checklists conducted by trainer.<br><br>Oral questioning with checklist conducted by<br><input type="checkbox"/> trainer to assess<br><input type="checkbox"/> underpinning knowledge.<br><br>Short tests to assess underpinning knowledge.<br><br>Learner<br><br><input type="checkbox"/><br><input type="checkbox"/><br><br><input type="checkbox"/><br><input type="checkbox"/> |

| Learning Outcome | Content                  | Suggested Assessment Methods |
|------------------|--------------------------|------------------------------|
|                  | recording documentation. | portfolio of evidence.       |

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| <p>5. Replace/service vehicle service parts.</p> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Identification of appropriate diagnostic equipment and instrumentation; The importance of equipment calibration before use;</li> <li><input type="checkbox"/> Identification of systems to be tested including: <ul style="list-style-type: none"> <li><input type="checkbox"/> Battery and charging;</li> <li><input type="checkbox"/> Fuel;</li> <li><input type="checkbox"/> Ignition;</li> <li><input type="checkbox"/> Engine management;</li> <li><input type="checkbox"/> Exhaust emission;</li> <li><input type="checkbox"/> Lighting;</li> <li><input type="checkbox"/> Electrical and electronics;</li> <li><input type="checkbox"/> Steering and suspension geometry</li> <li><input type="checkbox"/> Air-conditioning. Procedures for carrying out diagnostic tests and identification of faults</li> </ul> </li> <li><input type="checkbox"/> Carrying out adjustments in accordance with manufacturers</li> <li><input type="checkbox"/></li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Practical exercises with observation checklists conducted by trainer.</li> <li>Oral questioning with</li> <li><input type="checkbox"/> checklist conducted</li> <li><input type="checkbox"/> by trainer to assess. Underpinning knowledge. Short answer written tests to assess underpinning knowledge. Learner portfolio of evidence.</li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> </ul> |
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| <b>Learning Outcome</b>       | <b>Content</b>   | <b>Suggested Assessment Methods</b>  |
|-------------------------------|--|--|
|                               | <ul style="list-style-type: none"> <li>specifications</li> <li>• Rectification of identified faults to restore performance to original specifications</li> <li>• The use of checklists and recording documentation.</li> </ul> |  |
| <p>6. Conduct road tests.</p> | <ul style="list-style-type: none"> <li>• The use of manufacturers' specifications to identify the correct types and grades of lubricants and fluids for systems including:</li> </ul>  | <ul style="list-style-type: none"> <li><input type="checkbox"/> Practical exercises with observation checklists conducted by trainer. Oral questioning with checklist conducted by trainer to assess underpinning knowledge. Short answer written tests to assess underpinning knowledge. Learner portfolio of evidence</li> </ul> |



| <b>Learning Outcome</b>                                     | <b>Content</b>   | <b>Suggested Assessment Methods</b>   |
|---|--|---|
|   | environmental regulations.   |   |
| 7. Carry out adjustments to vehicle components and systems. | <ul style="list-style-type: none"> <li><input type="checkbox"/> Use of manufacturers technical information to identify operating specifications and tolerances; Special tools and equipment for checking and carrying out adjustments;</li> <li><input type="checkbox"/> Identification of components and systems that are to be checked and adjusted including: <ul style="list-style-type: none"> <li><input type="checkbox"/> Valve clearances;</li> <li><input type="checkbox"/> Spark plug gaps;</li> <li><input type="checkbox"/> Exhaust emission settings;</li> <li><input type="checkbox"/> Wheel, steering and suspension alignment; Headlight alignment;</li> <li><input type="checkbox"/> Drive belt tension;</li> <li><input type="checkbox"/> Engine idling speed; Lubricants and fluid levels; fuel pressure;</li> <li><input type="checkbox"/> Brake clearances;</li> <li><input type="checkbox"/> Tyre rotation;</li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Practical exercises with observation checklists conducted by trainer. Oral questioning with checklist conducted by trainer to assess underpinning knowledge. Short answer written tests to assess underpinning knowledge. Learner portfolio of evidence.</li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> </ul> |

| <b>Learning Outcome</b>             | <b>Content</b>   | <b>Suggested Assessment Methods</b>   |
|-------------------------------------|--|---|
|                                     | <ul style="list-style-type: none"> <li><input type="checkbox"/> Wheel balancing.</li> <li><input type="checkbox"/> The use of approved checklists and documentation to record checks and adjustments carried out.</li> </ul> |   |
| 8. Service Vehicle Wheels and Tyres | <ul style="list-style-type: none"> <li><input type="checkbox"/> Identifying and repairing tyre punctures Performing wheel balancing</li> </ul>   | <ul style="list-style-type: none"> <li><input type="checkbox"/> Practical</li> <li><input type="checkbox"/> Observations</li> </ul> |

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|  | <input type="checkbox"/> Performing tyre fitting on the rim<br>Straightening bent wheel rims<br><input type="checkbox"/> Replacing tyre pressure nozzles<br>Maintaining tyre pressure<br><input type="checkbox"/><br><input type="checkbox"/><br><input type="checkbox"/>  |   |
| 9. Finalize service and repair procedures. | <input type="checkbox"/> All maintenance activities completed within an agreed timescale; The vehicle interior and exterior clean and presentable in compliance with company policy;<br><input type="checkbox"/> A report for the customer that includes all the work that was carried out during the routine maintenance,<br><input type="checkbox"/> | <input type="checkbox"/> Practical exercises with observation checklists conducted by trainer. Oral questioning with checklist conducted by trainer to  |
| <b>Learning Outcome</b>                    | <b>Content</b>   | <b>Suggested Assessment Methods</b>   |
|  | including results of assessments, rectifications and replaced parts; A report to advise the customer of any further defect(s) that were identified during the routine maintenance, with recommendations for further action;<br>Maintenance records completed accurately in an approved format.<br><input type="checkbox"/>                             | assess underpinning knowledge.<br><input type="checkbox"/> Short tests to assess underpinning knowledge.<br><input type="checkbox"/> Learner portfolio of evidence.<br><input type="checkbox"/> |

### Suggested Methods of Delivery

- Presentations and practical demonstrations by trainer;
- Guided learner activities and research to develop underpinning knowledge;
- Supervised activities and projects in a workshop;
- The delivery may also be supplemented and enhanced by the following, if the opportunity allows:
- Visiting lecturer/trainer from the motor vehicle service and repair sector;
- Industrial visits.

## **Recommended Resources**

### **Tools**

Comprehensive set of hand tools for motor vehicle maintenance and repair.

### **Equipment**

- A fully equipped motor vehicle maintenance workshop;
- Fully functional light vehicle(s);
- Vehicle lift;
- Specialist tools and diagnostic equipment appropriate for the different makes of vehicles that are being maintained;
- Exhaust emission tester;
- Headlamp alignment equipment;
- Internet access to manufacturers' technical information;
- Torque setting tools;
- Personal protective equipment (PPE) and suitable coverings to protect vehicles;
- Facilities for the disposal of waste oil and used parts;
- Customer database and systems for recording maintenance records.

### **Materials and supplies**

Consumables for maintaining light vehicles including:

- Engine and transmission lubricants;
- Fluids for cooling systems, brakes, clutch, windscreen washer, hydraulic power assisted steering and diesel engine exhaust emission control;

Replacement parts including:

- Air, oil, exhaust, and air conditioning filters;
- Oil seals and gaskets;
- Brake pads and linings;
- Spark plugs;
- Screen wiper blades; □ Drive belts.
- Vehicle cleaning materials; □ Hand cleaner.

### **Reference materials**

- Manufacturers service manuals for vehicles that are being serviced; □ Appropriate automotive engineering text books available on numerous websites