

## SERVICE VEHICLE ELECTRICAL SYSTEMS

**UNIT CODE: ENG/OS/AUT/CR/6/4/A**

**UNIT DESCRIPTION:**

This unit specifies competencies required to service vehicle electrical systems. It involves inspecting vehicle electrical systems components, removing, dismantling, cleaning and examining electrical systems components, servicing/repairing/ replacing and assembling and testing vehicle electrical systems components, fitting components, testing and preparing vehicle electrical systems service report.

**ELEMENTS AND PERFORMANCE CRITERIA**

<b>Element</b> <i>These describe the key outcomes which make up workplace function.</i>	<b>Performance Criteria</b> <i>These are assessable statements which specify the required level of performance for each of the elements.</i> <b><i>(Bold and italicized terms are elaborated in the Range)</i></b>
1. Inspect vehicle electrical systems components	1.1 Vehicle is parked and prepared in accordance with workshop procedures 1.2 <b><i>Tools, equipment and necessary checklists</i></b> are assembled as per task requirements 1.3 <b><i>Personal protective clothing and equipment (PPEs)</i></b> is used as per <b><i>OSHA 2007</i></b> 1.4 Ignition system inspected as per the service manual 1.5 lighting system inspected as per the service manual 1.6 starting system inspected as per the service manual 1.7 Electrical defect(s) are identified as per manufacturers manual 1.8 Electrical system checklist is prepared based on workplace requirements
2. Remove, dismantle, clean and examine vehicle electrical components	2.1 <b><i>Ignition system components</i></b> are removed and dismantled as per the service manual 2.2 Ignition system components are cleaned and examined as per the SOPs  2.3 <b><i>lighting system components</i></b> are removed and dismantled as per the service manual 2.4 lighting system components are cleaned and examined as per the SOPs  2.5 <b><i>starting system components</i></b> are removed and dismantled as per the service manual 2.6 starting system components are cleaned and examined as per the SOPs

3.Service/Repair/ Replace and assemble vehicle electrical components and test	<p>3.1 Worn out Ignition system components are Serviced/Repaired/ Replaced and assembled as per service manual</p> <p>3.2 Ignition system components are assembled as per service manual</p> <p>3.3 Ignition system Components are tested as per manufacturers manual</p> <p>3.4 Starting system components are Serviced/Repaired/ Replaced and assembled as per service manual</p> <p>3.5 starting system components are assembled as per service manual</p> <p>3.6 starting system Components are tested as per manufacturers manual</p> <p>3.7 Worn out lighting system components are Serviced/Repaired/ Replaced and assembled as per service manual</p> <p>3.8 lighting system components are assembled as per service manual</p> <p>3.9 lighting system Components are tested as per manufacturers manual</p>
4.Fit components, test and prepare vehicle electrical system service report	<p>4.1 ignition system Components are fitted as per manufacturers manual</p> <p>4.2 Vehicle ignition system is tested as per the manufacturers specification</p> <p>4.3 starting system Components are fitted as per manufacturers manual</p> <p>4.4 Vehicle starting system is tested as per the manufacturers specification</p> <p>4.5 lighting system Components are fitted as per manufacturers manual</p> <p>4.6 <b>Beam</b> is set in accordance with manufacturers' specifications</p> <p>4.7 Vehicle electrical systems service and repair is completed and tested according to workplace policy</p> <p>4.8 Vehicle electrical system report is written and shared with relevant personnel according to workshop procedures</p> <p>4.9 Work area is cleaned in accordance with work shop procedures</p> <p>4.10 Waste is disposed as per OSHA act- 2007</p>

## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Electrical Diagnostic Tools and equipment may include but is not limited to:	<ul style="list-style-type: none"> <li>• General workshop equipped for servicing vehicle electrical systems;</li> <li>• Multi-meter</li> </ul>

Variable	Range
	<ul style="list-style-type: none"> <li>• Ignition test equipment.</li> <li>• Hydrometer</li> <li>• High rate discharge tester</li> <li>• Feeler gauge</li> </ul>
2. Service Manual may include but is not limited to:	<ul style="list-style-type: none"> <li>• Instructions provided by the manufacturer on how to remove, disassemble, repair and refit components</li> </ul>
3. Condition and functionality may include but is not limited to:	<ul style="list-style-type: none"> <li>• Specific gravity/hydrometer test</li> <li>• High rate discharge test</li> </ul>
4. Technical information may include but is not limited to:	<ul style="list-style-type: none"> <li>• Vehicle technical data;</li> <li>• Manufacturers' online information;</li> <li>• On-board diagnostics (OBD) displays;</li> <li>• Accessory manufacturers technical data</li> </ul>
5. Electrical systems may include but is not limited to:	<ul style="list-style-type: none"> <li>• Starting system including motors and battery terminals;</li> <li>• Ignition system components including steering lock switches;</li> <li>• Electrical wiring;</li> <li>• Lighting system including bulbs and sockets;</li> <li>• Battery</li> </ul>
6. Headlights may include but is not limited to:	<ul style="list-style-type: none"> <li>• Non-sealed beam</li> <li>• Sealed beam</li> </ul>
7. Flasher unit may include but is not limited to:	<ul style="list-style-type: none"> <li>• Hazard warning</li> <li>• Electronic type</li> </ul>

## REQUIRED KNOWLEDGE AND SKILLS

### Required knowledge

The individual needs to demonstrate knowledge of:

- Legislative and organizational requirements and procedures
- Kenyan legislation and workplace procedures
- recognized assessment and rectification procedures
- documenting assessment and rectification information.
- agreed timescales
- The relationship between time, costs and profitability
- The importance of reporting
- Vehicle earthing principles and earthing methods
- Types of circuit protection and why these are necessary.

- Electrical safety procedures, electric symbols, units and terms
- Electrical and electronic control system principles
- The hazards associated with *high energy electrical component*.
- The use of appropriate test methods
- Electrical principles

### Required Skills

The individual needs to demonstrate the following skills

- Proficient in ICT;
- Time management;
- Problem solving;
- Communications (verbal and written);
- Planning;
- Decision making;
- Multitasking;
- First aid
- Dismantling
- Inspecting
- Assembling
- Report writing;
- Driving
- Listening
- Team work

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### EVIDENCE GUIDE

This provides advice on assessment and must be in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency</p>	<p><b><i>Assessment requires evidence that the candidate:</i></b></p> <p>1.1 Worked in a safe and clean environment using personal protection, tools and equipment appropriately</p> <p>1.2 Observed regulations concerned with health and safety in the disposal of waste correctly</p> <p>1.3 Used technical information to remove and dismantle vehicle electrical systems correctly</p> <p>1.4 Examined vehicle electrical systems components correctly</p> <p>1.5 Repaired/serviced, replaced vehicle electrical systems components correctly</p> <p>1.6 Reassembled vehicle electrical systems components correctly</p> <p>1.7 Completed vehicle electrical systems servicing within set time frame</p>
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	1.8 Documented vehicle electrical systems servicing records correctly
2. Resource Implications	<b><i>the following resources must be provided:</i></b> 2.1 General workshop equipped for servicing vehicle electrical systems; 2.2 Electronic diagnostic equipment; 2.3 Multi-meters; 2.4 Ignition test equipment.
3. Methods of Assessment	<b><i>Competency may be assessed through:</i></b> 3.1 Observation 3.2 Oral questioning; 3.3 Written tests
4. Context of Assessment	Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions or during Industrial Attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.