

**MODULE MEC2090: ELECTRICAL COMPONENTS****Level:** Intermediate**Theme:** Guidance and Control Systems**Prerequisite:** MEC1090 Electrical Fundamentals**Module Description:** Students identify and describe the basic use and testing of the electrical components of a typical motor vehicle.**Module Parameters:** Voltmeter, ohmmeter, ammeter, alternator, starter and related resources.**Curriculum and Assessment Standards**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>• demonstrate safe work practices when working with electrical components</li> <li>• describe the function and operation of a vehicle's electrical systems and components</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• observed performance in relation to: <ul style="list-style-type: none"> <li>– following shop electrical routines</li> <li>– avoiding electrical shorts, sparks and unwanted grounds</li> <li>– observing proper polarity.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>Task Assessment Checklist: Electrical Components, Part 1, MEC2090-1</i></p> <p><i>Standard</i>  <i>Performance rating of 2 on each criteria</i></p> <ul style="list-style-type: none"> <li>• a report that lists and describes the <ul style="list-style-type: none"> <li>– purpose and function of vehicle electrical systems</li> <li>– principal components in each system</li> <li>– overall operation of the electrical system.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>Task Assessment Checklist: Electrical Components, Part 2, MEC2090-1</i></p> <p><i>Standard</i>  <i>Performance rating of 2 on each criteria</i></p>	<p>10</p> <p>15</p>

**MODULE MEC2090: ELECTRICAL COMPONENTS (continued)**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>identify electrical faults, by using standard diagnostic and testing procedures</li> <li>test and service electrical components</li> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observed performance in:                             <ul style="list-style-type: none"> <li>use of voltmeter, ohmmeter and ammeter</li> <li>testing for open and closed circuits</li> <li>testing for load voltage and voltage drop</li> <li>testing for current draw</li> <li>testing for resistances</li> <li>recognizing abnormal electrical circuit conditions.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>Task Assessment Checklist: Electrical Components, Part 3, MEC2090-1</i></p> <p><i>Standard</i>  <i>Performance rating of 2 on each criteria</i></p>	25
	<ul style="list-style-type: none"> <li>observed performance in testing and overhaul of:                             <ul style="list-style-type: none"> <li>starter motor repair and assembly</li> <li>alternator repair and assembly</li> <li>testing assembled starter/alternator.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>Task Assessment Checklist: Electrical Components, Part 4, MEC2090-1</i></p> <p><i>Standard</i>  <i>Performance rating of 2 on each criteria</i></p>	50
	<ul style="list-style-type: none"> <li>observations of individual effort and interpersonal exploration during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

Concept	Specific Learner Expectations	Notes
Health/Safety Hazards	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>demonstrate knowledge of and follow lab safety procedures with respect to electrical hazards, such as:                             <ul style="list-style-type: none"> <li>electrical shocks</li> <li>electrical burns</li> </ul> </li> <li>demonstrate how to avoid sparks and grounding</li> <li>explain electrical polarity.</li> </ul>	Be aware of the dangers of wearing jewellery.

**MODULE MEC2090: ELECTRICAL COMPONENTS** (continued)

Concept	Specific Learner Expectations	Notes
System/Component Function	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• locate the major electrical/electronic systems in a motor vehicle: lighting, charging and starting</li> <li>• explain the operation and function of each of the electrical/electronic systems</li> <li>• show how electrical/electronic systems interact with other vehicle systems; e.g., suspension and braking systems</li> <li>• for charging, starting and lighting systems, identify and explain the purpose and their basic component parts</li> <li>• identify and draw the symbols for common electrical components</li> <li>• identify and describe the ratings that are given to electrical components; e.g., resistance, voltage, amperage and power rating.</li> </ul>	Draw block diagrams.
Identification/Function	<ul style="list-style-type: none"> <li>• identify and describe the purpose and functions of a:               <ul style="list-style-type: none"> <li>– voltmeter</li> <li>– ohmmeter</li> <li>– ammeter</li> <li>– multimeter</li> <li>– load tester</li> <li>– tack dwell meter</li> <li>– growler</li> </ul> </li> <li>• calibrate correctly, connect accurately and read the appropriate test equipment to determine:               <ul style="list-style-type: none"> <li>– open and closed circuit</li> <li>– load voltage and drop</li> <li>– current draw</li> <li>– component resistance.</li> </ul> </li> </ul>	Perform insulated and ground circuit resistance tests.
Inspect/Repair	<ul style="list-style-type: none"> <li>• identify and correct faults associated with electrical components and instruments</li> <li>• overhaul a starter motor assembly</li> <li>• overhaul an alternator.</li> </ul>	