

MODULE MEC1090: ELECTRICAL FUNDAMENTALS

Level:	Introductory
Theme:	Guidance and Control Systems
Prerequisite:	None
Module Description:	Students identify and describe the operating principles and applications of electricity.

Module Parameters: Access to multimeter, battery hydrometer, battery charger, related battery tools, electrical supplies.

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"> demonstrate safe use of electrical tools and equipment, and follow established lab procedures apply electrical principles and concepts to test electrical circuits and components demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> observed performance related to: <ul style="list-style-type: none"> following established lab/shop procedures using personal protective equipment, recognizing electrical hazards, proper storage battery handling/service and correct use of electrical meters. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Electrical Fundamental, Part 1, MEC1090-1</i></p> <p><i>Standard</i> <i>Performance rating of 1 or more on each criteria</i></p>	15
	<ul style="list-style-type: none"> observed performance in: <ul style="list-style-type: none"> recognition of series and series parallel circuits on a vehicle measuring voltages, resistances and current flow in lighting, charging and starting systems testing a battery. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Electrical Fundamentals, Part 2, MEC1090-1</i></p> <p><i>Standard</i> <i>Performance rating of 1 or more on each criteria</i></p>	85
	<ul style="list-style-type: none"> observations of individual effort and interpersonal exploration during the learning process. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	Integrated throughout

MODULE MEC1090: ELECTRICAL FUNDAMENTALS (continued)

Concept	Specific Learner Expectations	Notes
Health/Safety Hazards	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • safely use tools/equipment and follow established lab procedures • identify causes of battery explosion/acid burns • describe electrical shock/burns/fires • outline a plan of action when an accident occurs. 	Use face/eye protection when working around batteries.
Identification/Function	<ul style="list-style-type: none"> • describe magnetic attraction and repulsion • produce a temporary and permanent magnet • find the polarity of an electromagnet • describe the electron theory in relation to the parts of an atom • describe production of electricity: <ul style="list-style-type: none"> – chemically – thermally – photoelectrically – piezoelectrically – electromagnetically • explain the difference between AC and DC current. • identify and label the parts of a simple circuit • identify the physical form and circuit symbol of a: <ul style="list-style-type: none"> – light – motor – heating element – solenoid – fuse – other • describe what conditions create: <ul style="list-style-type: none"> – an open circuit – a closed circuit – a short circuit – a grounded circuit 	Explain how static charges are produced and their effects on a vehicle.

MODULE MEC1090: ELECTRICAL FUNDAMENTALS (continued)

Concept	Specific Learner Expectations	Notes
Identification/ Function (continued)	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • describe how a frame-ground circuit operates on a motor vehicle • define what is meant by: <ul style="list-style-type: none"> – amperage – voltage – resistance • compare the similarity between electrical and fluid energy. 	
Inspect/Service	<ul style="list-style-type: none"> • construct and compare a series and a parallel circuit • measure, with appropriate meters, the resistance, voltage and amperage in a given circuit • describe the relationship that exists among the amperage, voltage and resistance within a circuit • describe condition of a battery and service. 	<p>Develop a working model, block diagrams of lighting, starting charging system.</p> <p>Be aware of the hazards associated with testing and charging a battery</p>
Careers	<ul style="list-style-type: none"> • identify further education and work opportunities related to servicing electrical circuits and components. 	