

MODULE MEC2050: ALTERNATIVE FUEL ENGINES

Level: Intermediate

Theme: Propulsion Systems

Prerequisite: MEC1040 Engine Fundamentals

Module Description: Students determine alternative fuels used to power motor vehicles.

Module Parameters: Access to related resources, basic hand tools.

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 work practices when working with alternative fuel vehicles • determine the type of fuel that is best suited to a particular use and type of vehicle • service an alternative fuel vehicle, recognizing its unique maintenance requirements • 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"> – appropriate personal and vehicle safety procedures when starting, stopping, parking and refuelling alternate fuel vehicles – safe storage of alternate fuels. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Alternative Fuel Engines, Part 1, MEC2050–1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p> <ul style="list-style-type: none"> • ability to identify alternate fuels that are best suited to particular tasks and requirements. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Alternative Fuel Engines, Part 2, MEC2050–1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p> <ul style="list-style-type: none"> • performance in servicing an alternate fuelled vehicle. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Alternative Fuel Engines, Part 3, MEC2050–1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p> <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>	<p>20</p> <p>35</p> <p>45</p> <p>Integrated throughout</p>

MODULE MEC2050: ALTERNATIVE FUEL ENGINES (continued)

Concept	Specific Learner Expectations	Notes
Health/Safety Hazards	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • demonstrate knowledge of and follow lab safety procedures • state how alternative fuels affect the environment. 	<p>Note dangers involved in working on vehicles using, e.g., propane, natural gas.</p>
Identification/Function	<ul style="list-style-type: none"> • identify the typical alternative fuels; e.g.: <ul style="list-style-type: none"> – diesel – propane – methanol – natural gas – hydrogen • compare the heat-producing characteristics of each fuel • identify resources and methods of marketing different types of fuel • identify ways in which fuels are stored • describe the engine design modifications that are required to operate on: <ul style="list-style-type: none"> – diesel – propane – methanol – others. 	<p>Use BTU charts from oil companies.</p> <p>Bulk and vehicle storage.</p>
Application	<ul style="list-style-type: none"> • describe the advantages of using an alternative fuel by considering: <ul style="list-style-type: none"> – fuel cost – availability – performance – engine life – environmental impact. 	
Inspect/Service	<ul style="list-style-type: none"> • describe the specific service requirement for an alternative fuel engine • complete a service and maintenance task according to the manufacturer's recommendations; e.g., change oil and fuel filters, engine lubricant, glow plugs and heaters. 	
Careers	<ul style="list-style-type: none"> • identify further education, working conditions and career opportunities. 	