

MODULE MEC2040: FUEL & EXHAUST SYSTEMS**Level:** Intermediate**Theme:** Propulsion Systems**Prerequisite:** MEC1040 Engine Fundamentals**Module Description:** Students diagnose, maintain and service the fuel and exhaust system of a typical four-cycle gasoline engine.**Module Parameters:** Access to ventilated area, fuel pump vacuum/pressure tester and related resources and to instruction from a certified technician when working on a customer vehicle.**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 volatile liquids and combustion gases 	<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 shop routines and procedures following safe practices and proper use of storage containers, safety devices, tools and equipment while working on fuel and exhaust systems proper use of fire extinguishers, storage containers, measuring devices, meters and related tools and equipment. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Fuel & Exhaust Systems, Part 1, MEC2040-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p>	10
<ul style="list-style-type: none"> identify and describe functions and operations of engine fuel and exhaust system components 	<ul style="list-style-type: none"> identification and description of fuel and exhaust system components, functions and operations description of the importance and effects of correct air fuel ratio on combustion description of the symptoms associated with a rich mixture-lean mixture discussion of air flow, atomizing, pre- and post-ignition explanation of factors that affect exhaust system performance. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Fuel & Exhaust Systems, Part 2, MEC2040-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 on each criteria</i></p>	25

MODULE MEC2040: FUEL & EXHAUST SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
<p>Identification/ Function</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • describe the chemical composition of gasoline and the effect complete and incomplete combustion have on the environment and engine performance • describe the characteristics of a quality gasoline in relation to its volatility and octane rating • identify measures that are taken to: <ul style="list-style-type: none"> – prevent the formation of gum deposits – prevent the oxidation of metal parts – retard icing – aid in the identification of fuel types and grades • describe the factors that affect combustion, such as: <ul style="list-style-type: none"> – spark plug location – combustion chamber size and shape – compression ratio – valve and combustion chamber design – spark timing, duration and intensity – air temperature and fuel ratio – manifold pressures – valve timing, valve lift and duration • identify and describe the function of the major fuel system components • explain the difference between a carburetor and a fuel injected system • identify the common problems associated with carburetors and fuel injected systems • locate and describe the function of the major exhaust system components. 	<p>Note the effect of a blocked exhaust system.</p>

MODULE MEC2040: FUEL & EXHAUST SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
Inspect/Service	<p><i>The student should:</i></p> <ul style="list-style-type: none">• inspect fuel filter/strainer and replace if necessary• clean and adjust a typical carburetor on and off an engine• visually inspect and test a typical fuel injection system• test fuel pump pressure and capacity; repair or replace if necessary• visually inspect and test for exhaust leaks or blockages; replace converters, pipes, mufflers if necessary.	
Careers	<ul style="list-style-type: none">• identify further education, working conditions and career opportunities.	