

MODULE MEC3030: ENGINE DIAGNOSIS**Level:** Advanced**Theme:** Propulsion Systems**Prerequisite:** MEC1040 Engine Fundamentals**Module Description:** Students learn to diagnose the condition of an engine for worn or damaged parts and/or improper adjustments.**Module Parameters:** Access to vehicle engine, diagnostic test equipment and related resources.**Supporting Modules:** MEC2030 Lubrication & Cooling
MEC2040 Fuel & Exhaust Systems
MEC2060 Ignition Systems
MEC2070 Emission Controls**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 working practices while conducting an engine performance diagnosis 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> observed performance in: <ul style="list-style-type: none"> following safe lab practices recognizing and controlling potential hazards during engine diagnosis. <p><i>Assessment Tool</i> <i>Assessment Checklist: Health and Safety, MECH&S</i></p> <p><i>Standard</i> <i>Performance rating of 3 on each criteria</i></p>	10
	<ul style="list-style-type: none"> diagnose the condition of an operating engine, using body senses (touch, sight, hearing), <ul style="list-style-type: none"> observed performance in demonstrating ability to diagnose engine faults by using: <ul style="list-style-type: none"> sense of touch sense of sight sense of hearing. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Engine Diagnosis, Part 1, MEC3030-1</i></p> <p><i>Standard</i> <i>Performance rating of 3 on each criteria</i></p>	25

MODULE MEC3030: ENGINE DIAGNOSIS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • assess engine conditions, using specialized test equipment and on-board diagnostic systems • provide a report that describes the condition of an engine • demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • observed performance in using equipment to determine the condition of a given engines: <ul style="list-style-type: none"> – ignition systems – fuel system – cooling/exhaust system – emission control system – mechanical system. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Engine Diagnosis, Part 2, MEC3030–1</i> <i>Laboratory Problem Solving, MECLPS</i></p> <p><i>Standard</i> <i>Performance rating of 3 on each criteria</i></p> <ul style="list-style-type: none"> • report generated to reflect the true condition of a given engine. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Engine Diagnosis, Part 3, MEC3030–1</i> <i>Illustrative Example: Engine Diagnosis, MEC3030–2</i></p> <p><i>Standard</i> <i>Performance rating of 3 on each criteria</i></p> <ul style="list-style-type: none"> • observations of individual effort and interpersonal interaction during the learning process. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>50</p> <p>15</p> <p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Health/Safety Hazards	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • demonstrate safety while diagnosing engines. 	

MODULE MEC3030: ENGINE DIAGNOSIS (continued)

Concept	Specific Learner Expectations	Notes
Identify/Analyze	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • list possible engine problems based on information provided • describe through listening, observing, touching a running and/or stopped engine, whether abnormalities exist. • identify engine type and manufacturer's specifications • show how to: <ul style="list-style-type: none"> – analyze intake manifold vacuum – check ignition timing and advance mechanisms – check for proper idle speeds – check engine oil pressure – check cylinder compression readings – check exhaust emissions • identify any abnormalities on the vehicle, using gauges and lights, including self-diagnostics • use an engine analyzer and/or computerized tester to describe the condition of various engine systems as per capability of the test unit • compile all information and generate a report for the customer outlining defects found and recommended corrections. 	<p>Owner complaints.</p> <p>For example, noises, blow-by, oil leaks, loose connections/parts, oil/coolant conditions, belts, hoses and filters.</p> <p>Students generate their own format.</p>
Careers	<ul style="list-style-type: none"> • identify further education and career opportunities related to engine performance and diagnosis. 	