

MODULE MEC3060: ENGINE RECONDITIONING 1**Level:** Advanced**Theme:** Propulsion Systems**Prerequisite:** MEC3050 Engine Replacement**Module Description:** Students determine the need for service, and perform the required service, on the cylinder head and related components of an engine.**Module Parameter:** Access to cylinder head rebuilding equipment measuring tools and related resources.**Supporting Modules:** MEC3030 Engine Diagnosis
MEC3040 Engine Tune-up**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 procedures related to cylinder head work 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> observed performance in following: <ul style="list-style-type: none"> precautions related to removal and installation of cylinder head(s) safe practices in reconditioning cylinder head(s). <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"> determine the condition of a cylinder head before and after disassembly 	<ul style="list-style-type: none"> a diagnostic report that: <ul style="list-style-type: none"> describes the overall condition of a cylinder head repair work/reconditioning required. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Cylinder Head Reconditioning, Part 1, MEC3060-1</i></p> <p><i>Standard</i> <i>Performance rating of 3 on each criteria</i></p>	15

MODULE MEC3060: ENGINE RECONDITIONING 1 (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • recondition a cylinder head and its related components • reassemble and install a cylinder head • demonstrate basic competencies. 	<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"> – disassembly of a cylinder head – checking/measuring to determine condition of cylinder head, valves, seats, guides, springs – reconditioning valves, seats and guides – assembly of cylinder head and required checks— valve spring and stem heights – checking condition of related components: <ul style="list-style-type: none"> • rocker arms (shafts) • push rods • camshaft • lifters • sprockets, gears, chains. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Cylinder Head Reconditioning, Part 2, MEC3060–1</i> <i>Illustrative Example: Cylinder Head Reconditioning, MEC3060–2, Cylinder Head Assembly Measurement, MEC3060–3</i></p> <p><i>Standard</i> <i>Performance rating of 3 on each criteria</i></p> <ul style="list-style-type: none"> • observed performance in: <ul style="list-style-type: none"> – reassembling a cylinder head according to manufacturer’s recommended procedures – installation of cylinder head and related components observing torque and sequence, head gasket positioning and other related gaskets – adjustments related to the work. <p><i>Assessment Tool</i> <i>Task Assessment Checklist: Cylinder Head Reconditioning, Part 3, MEC3060–1</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>60</p> <p>15</p> <p>Integrated throughout</p>

MODULE MEC3060: ENGINE RECONDITIONING 1 (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. 	
Identify/Analyze	<ul style="list-style-type: none"> • perform checks to determine condition of cylinder head and related parts • describe blue-printing procedures for cylinder heads • calculate costs of blue-printing. 	<p>Compression test, vacuum test, valve timing, oil pressure.</p> <p>Reference: <i>Step-By-Step Engine Blue Printing</i>, Rick Voegelin.</p>
Inspect/Service	<ul style="list-style-type: none"> • clean cylinder head and related parts • inspect parts for serviceability • machine parts • assemble cylinder head and check valve spring and stem height • service push rods, lifters, rocker arms, chain, gears and camshaft, pulleys, belts • install cylinder head and make adjustments • address unique concerns related to overhead camshaft engines • run engine and evaluate work done • adjust to specifications. 	<p>Field trips to machine shops.</p> <p>Cracks, warpage, guide, valve stem wear.</p> <p>Grind valves, seats, recondition guides.</p> <p>Torque, sequence, specification and techniques/valve adjustments.</p> <p>Stress importance of belt/chain tension and condition.</p>
Careers	<ul style="list-style-type: none"> • identify the demand for skills related to engine reconditioning. 	