

TASK ASSESSMENT CHECKLIST: Buying & Selling Vehicles

MEC3010-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Determining Vehicle <input type="checkbox"/> predetermines criteria for choosing a vehicle <input type="checkbox"/> selects and states why a particular vehicle is chosen <input type="checkbox"/> states how vehicle meets financial, emotional, service constraints	3	_____
Part 2	Evaluating Selected Vehicle <input type="checkbox"/> inspects vehicle systems/components to determine its worth <input type="checkbox"/> compares inspection data to predetermined constraints <input type="checkbox"/> evaluates whether purchase would be within predetermined constraints	3	_____
Part 3	Buying and Selling <input type="checkbox"/> outlines steps in selling or buying a vehicle <input type="checkbox"/> lists steps involved in determining a selling price for a vehicle <input type="checkbox"/> develops an advertisement for a vehicle	3	_____
Part 4	Legal Responsibilities <input type="checkbox"/> identifies legal responsibilities and implications when buying a vehicle <input type="checkbox"/> identifies legal responsibilities and implications when selling a vehicle	3	_____
Part 5	Safety <input type="checkbox"/> outlines safety concerns when purchasing a vehicle <input type="checkbox"/> outlines safety concerns when selling a vehicle <input type="checkbox"/> completes a safety checklist	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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TASK ASSESSMENT CHECKLIST: Vehicle Value Appraisal

MEC3020-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Safety <input type="checkbox"/> follows shop/lab routines <input type="checkbox"/> completes inspections in a safe manner	3	_____
Part 2	Inspecting Vehicle Condition <input type="checkbox"/> inspects all vehicle systems <input type="checkbox"/> collects data and reports service/repair requirement <input type="checkbox"/> estimates cost of required service/repair	3	_____
Part 3	Industry Estimating Standards <input type="checkbox"/> describes estimating standards used by industry <input type="checkbox"/> identifies problems when estimating to industry standards <input type="checkbox"/> reports on the true market value of a vehicle	3	_____
Part 4	Conflicts <input type="checkbox"/> outlines business practice when attempting to resolve conflicts related to estimations and evaluations	3	_____
Rating Scale: 4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards.</i> 3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent.</i> 2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent.</i> 1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent.</i> 0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.		REFLECTIONS/COMMENTS:	

TASK ASSESSMENT CHECKLIST: Engine Diagnosis

MEC3030-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Engine Diagnosis (Without Tools) <input type="checkbox"/> evaluates engine performance using sense of touch, hearing and sight (no diagnostic tools)	3	_____
Part 2	Engine Diagnosis (With Tools) <input type="checkbox"/> selects and uses the appropriate diagnostic tools and equipment to diagnose the condition of: <ul style="list-style-type: none"> - mechanical system - ignition system - cooling/exhaust system - fuel system - emission control system 	3	_____
Part 3	Report <input type="checkbox"/> interprets test results <input type="checkbox"/> lists and provides rationale for areas requiring attention <input type="checkbox"/> provides a cost analysis <input type="checkbox"/> records test results	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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Module Learner Expectation:	<p><i>The student will:</i></p> <ul style="list-style-type: none"> • provide a report that describes the condition of an engine.
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SAMPLE ITEM(S) ON REPORT	
Items Checked	Condition
<p>Engine Mechanical Checks</p> <ul style="list-style-type: none"> • dry and wet compression test readings for each cylinder • cylinder leakage test for each cylinder • vacuum test with tachometer <ul style="list-style-type: none"> – idle – acceleration, deceleration • cylinder power balance test • valve adjustment <p>Battery Test Checks</p> <ul style="list-style-type: none"> • hydrometer • load test • three-minute charge test • cranking voltage test <p>Starting System Checks</p> <ul style="list-style-type: none"> • cranking current test • insulated/ground circuit <p>Charging System Checks</p> <ul style="list-style-type: none"> • alternator output test • voltage regulation test • insulated/ground circuit resistance checks <p>Ignition System (oscilloscope check)</p> <ul style="list-style-type: none"> • point ignition <ul style="list-style-type: none"> – dwell, point gap/condition, primary voltages • electronic ignition (follow manufacturers recommendations) • secondary ignition <ul style="list-style-type: none"> – coil output/polarity, distributor cap, rotor, secondary, wires, spark plugs condition, spark timing/advance <p>Fuel System Checks</p> <ul style="list-style-type: none"> • fuel pump pressure/capacity test • carburetor functions test • fuel injection power balance test <p>Emission Control Check</p> <ul style="list-style-type: none"> • PVC, ECS, EGR, AIR, computer controlled emission system, exhaust emission check 	

TASK ASSESSMENT CHECKLIST: Engine Tune-up

MEC3040-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<p><i>The student:</i></p> <p>Engine Mechanical</p> <input type="checkbox"/> establishes a diagnostic sequence <input type="checkbox"/> selects and uses appropriate equipment and resources <input type="checkbox"/> performs mechanical condition test <input type="checkbox"/> interprets data, establishes condition of engine	3	_____
Part 2	<p>Fuel System</p> <input type="checkbox"/> establishes diagnostic sequence <input type="checkbox"/> selects and uses diagnostic equipment <input type="checkbox"/> analyzes data and determines service requirements <input type="checkbox"/> services carbureted system <input type="checkbox"/> services a fuel injected system	3	_____
Part 3	<p>Electrical, Emission, Exhaust</p> <input type="checkbox"/> establishes diagnostic sequence <input type="checkbox"/> selects and uses equipment to diagnose ignition, starting and charging system <input type="checkbox"/> selects and uses equipment to diagnose emission and exhaust system <input type="checkbox"/> analyzes data and determines service requirements <input type="checkbox"/> services ignition, starting and charging systems <input type="checkbox"/> services emission control and exhaust system	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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SAMPLE ITEM(S)	
SERVICED DURING TUNE UP	
Part 1: MLE	Determine Engine Mechanical Condition <ul style="list-style-type: none"> • check engine compression pressures • check and correct engine manifold vacuum readings • check and adjust valve clearances
Part 2: MLE	Check and Service Carburetor/Fuel Injection System <ul style="list-style-type: none"> • check and change filters • check fuel pump pressure/capacity and correct • check, adjust and clean carburetor • check, clean and/or replace fuel injectors
Part 3: MLE	Use Diagnostic Equipment to Check, Interpret and Service Ignition, Charging, Starting, Emission Control and Exhaust System <ul style="list-style-type: none"> • check and adjust belt(s) tension • check and/or replace hoses • check and service battery/cables • check and correct alternator output and voltage • check and correct starter current draw and circuit voltage drops • check, clean or replace emission control system components (PCV, AIR, EEC, EGR, catalytic converter) • check and correct exhaust system • other - engine compartment fluids for condition and level, tires and any other items specified in service schedule

SERVICE REQUIREMENTS	
Mechanical System	
Fuel System	
Electrical and Emission Control System	

TASK ASSESSMENT CHECKLIST: Engine Replacement

MEC3050-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module conditions and criteria.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Pre-Engine Removal <input type="checkbox"/> follows prescribed environmental precautions <input type="checkbox"/> prepares for storage of components and fasteners <input type="checkbox"/> uses resources to determine techniques and procedures	3	_____
Part 2	Engine Accessories <input type="checkbox"/> establishes a method of determining how to replace hoses, lines wires, clips, brackets, etc., in their respective locations <input type="checkbox"/> removes and replaces accessories and related components	3	_____
Part 3	Engine Removal/Replacement <input type="checkbox"/> follows manufacturer’s recommendations for proper lifting/dropping points on an engine (including fastener precautions) <input type="checkbox"/> follows recommended procedures for removing and installing engine <input type="checkbox"/> re-establishes all components including proper torques, routing, alignment, etc.	3	_____
Part 4	Post Installation <input type="checkbox"/> installs necessary fluids <input type="checkbox"/> makes appropriate adjustments prior to start-up <input type="checkbox"/> performs start-up and engine run in procedures <input type="checkbox"/> makes final adjustments/corrections before customer delivery	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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Module Learner Expectation:

The student will:

- identify steps involved to prepare a vehicle for engine removal.

SAMPLE ITEM(S)**STEPS REQUIRED BEFORE ENGINE REMOVAL**

- Determine reason for engine removal (many tasks can be done with engine in chassis).
- Determine location of vehicle allowing for sufficient work space.
- Determine if engine will be removed with or without transmission.
- Determine protection required for painted surfaces.
- Scribe hood hinges.
- Drain engine oil and coolant.
- Disconnect and storage of battery.
- Disconnect and marking all wires, vacuum hoses.
- Remove radiator hoses, radiator and fan.
- Remove drive belts, air cleaner, accessories and any other item(s) preventing removal of engine.
- Determine where to install engine sling, fasteners to use and torque required for sling bolts.
- Use engine hoist, remove weight of engine from chassis.
- Determine whether to remove engine mounts from chassis or engine.
- Determine if transmission is left in:
 - support transmission if removed
 - drain fluid, remove axle shafts/driveshaft
 - speedometer cable.
- If standard transmission, remove clutch linkage/cable/hose.
- Determine how to store fasteners/components.

TASK ASSESSMENT CHECKLIST: Cylinder Head Reconditioning

MEC3060-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Cylinder Head Diagnoses & Removal <input type="checkbox"/> selects and uses diagnostic tools to perform checks before disassembly <input type="checkbox"/> interprets data and indicates possible faults	3	_____
Part 2	Cylinder Head Service <input type="checkbox"/> disassembles, cleans and stores cylinder head and components <input type="checkbox"/> performs necessary measurements/checks <input type="checkbox"/> interprets data and determines service required <input type="checkbox"/> performs valve, valve seat and guide service <input type="checkbox"/> assembles cylinder head, checks and adjusts valve spring heights to manufacturers recommendations <input type="checkbox"/> checks/services cylinder head related components	3	_____
Part 3	Cylinder Head Removal/Installation <input type="checkbox"/> removes cylinder head and related components <input type="checkbox"/> prepares, organizes and stores components <input type="checkbox"/> installs cylinder head and related components <input type="checkbox"/> makes adjustments before start-up	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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Module Learner Expectations

The student will:

- recondition a cylinder head and its related components.

SAMPLE ITEM(S)**WHEN RECONDITIONING CYLINDER HEADS AND RELATED COMPONENTS**

Cylinder head work will vary depending on the length of service, cast iron or aluminium, whether overhead cam or not. It is important that a thorough analysis be done to determine the extent of the reconditioning. The following sample list represents a complete reconditioning of cylinder head.

- **Head Assembly:**
 - Heads are easier to work on if cleaned before disassembly, and face protection should be worn when removing valve springs.
 - Items such as valves, springs, retainers, rocker arms, lifters, push rods, camshaft bearing caps, journals must be kept in their original order.
 - Using valve spring compressor, remove valve springs.
 - Measure valve stem height, record and remove valve.
- **Carbon Removal:**
 - Several methods maybe used to remove carbon, such as portable wire wheel/brush scrapers and/or glass bead. Cleaning all surfaces including guides.
- **Crack Inspection:**
 - Several methods are available such as visual, magnetic dye penetrate or pressure testing.
- **Warpage Inspection:**
 - Using straight edge and feeler gauge, check warped or bent cylinder head deck.
- **Valve Guides Inspection:**
 - Several methods can be used including dial indicator, small hole gauge and micrometer. Check for maximum clearance, which generally occurs near the top or bottom of the guide. Record readings.
- **Valve Inspection:**
 - Measure valve stem wear with a micrometer and record readings.

- **Valve Guide Repair:**
 - If clearances are excessive, clearances can be restored in several ways - replaceable guides replaced, integral guides reamed and inserts installed or valves replaced with oversized stems or guides knurled.
- **Grinding Valves:**
 - Grind valve face to specified angle and check if sufficient valve margin exists. Grind valve stem tip and chamfer.
- **Grinding or Cutting Valve Seats:**
 - Grind to specified angle and check valve face to seat contract and adjust to recommended position and seat width.
 - NOTE: Valve seats may require replacement.
- **Assemble Cylinder Head:**
 - Clean head thoroughly, lubricate valve stems, install new valve stem guide seal and assemble valves in head. Check and adjust assembled valve spring height.

Related Components:

- **Camshaft:**
 - Check for straightness, lobe wear/condition, journal size and wear.
- **Camshaft Bearings:**
 - Wear and size.
- **Lifters:**
 - Base condition, bore clearance, if hydraulic, leak down rate.
- **Push Rods:**
 - Straightness, end wear.
- **Rocker Arms and Shaft:**
 - Clearance and bore wear, push rod end and valve stem end wear (maybe machined on some rocker arms).
- **Camshaft Chain/Sprockets/Gears:**
 - Checked for wear.
- **Timing Belt:**
 - Checked for wear, consult manufacturers recommendations for replacement.
- **Manifolds:**
 - Check for cracks, warpage, coolant/air passages, carbon build-up, good machined surfaces.

ILLUSTRATIVE EXAMPLE: Cylinder Head Assembly Measurement

MEC3060-3

Module Learner Expectation:

The student will:

- recondition a cylinder head and its related components.

Measurement appraisal using: steel rule, straight edge, feeler gauges, calipers, depth gauge and outside micrometer

	Cylinder Head Warpage	Valve Margin	Stem Diameter	Guide Diameter	Stem To Guide Clearance	Seat Width	Valve Spring Assembled Height	Valve Stem Assembled Height
Manufacturers Specifications:								
Valve #1								
Valve #2								
Valve #3								
Valve #4								
Valve #5								
Valve #6								
Valve #7								
Valve #8								
Minimum standard for measuring accuracy	± .001 inches or ± .025 mm	± .015 inches or ± .4 mm	± .001 inches or ± .025 mm	± .001 inches or ± .025 mm	± .001 inches or ± .025 mm	± .015 inches or ± .4 mm	± .001 inches or ± .025 mm	± .001 inches or ± .025 mm

From the above measurements, students would make a decision regarding part replacement or further service.

The above chart can be expanded to adapt to engines with more valves.

REFLECTIONS/COMMENTS:

TASK ASSESSMENT CHECKLIST: Cylinder Block Reconditioning

MEC3070-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<p><i>The student:</i></p> <p>Cylinder Block Inspection/Diagnosis</p> <ul style="list-style-type: none"> <input type="checkbox"/> selects and uses appropriate diagnostic tools to inspect cylinders, pistons, rods, crankshaft, camshaft, bearings and related components <input type="checkbox"/> interprets data and develops plan of action for service <input type="checkbox"/> creates a cost estimate and timeline for service 	3	_____
Part 2	<p>Cylinder Block Service</p> <ul style="list-style-type: none"> <input type="checkbox"/> services cylinder block <input type="checkbox"/> services piston rod assembly <input type="checkbox"/> services crankshaft/camshaft (if applicable) <input type="checkbox"/> services related components (oil pump, crankshaft balancer) 	3	_____
Part 3	<p>Cylinder Block Disassembly/Assembly</p> <ul style="list-style-type: none"> <input type="checkbox"/> disassembles cylinder block observing precautions for reassembly <input type="checkbox"/> prepares, organizes and stores components <input type="checkbox"/> assembles cylinder block and related components to manufacturers recommendations 	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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Module Learner Expectation:*The student will:*

- recondition a cylinder block and its related components.

Note: Cylinder block inspection, service and repair will depend on type of cylinder block. For this module learner expectation, cylinder rebore is not included.

SAMPLE ITEM(S)**FOR CYLINDER BLOCK RECONDITIONING****CYLINDER BLOCK**

- Decking of the Block:
 - Draw file the decking surfaces. With straight edge and feeler gauges, check for warpage and cracks.
- Cylinder Bore:
 - Check cylinder bore for taper, out-of-roundness and size (maximum wear 90° to piston pin). Check the cylinder bore for cracks, excessive scuffing or scratches.
 - If cylinder bore checks indicate reuse of block - make certain ring ridge is removed and cylinders are de-glazed (if recommended)
- Lifter Bores:
 - Check size and cleanliness of oil passages.
- Oil Galleries and Coolant Passage:
 - Check for cleanliness and tight plugs.
- Cam Bearings/Bore:
 - Check condition, size and replace if necessary
- Crankshaft:
 - Check for bends, cracks, clear oil passages. Journals are checked for condition, size, taper and out of roundness. If crankshaft does not check-out, it must be reground or polished.
- Pistons:
 - Piston skirts are checked for scuffing, size and taper. If not within manufacturers specifications, replace.
- Piston Grooves:
 - Checked for wear and side clearance (if excessive wear, groove inserts maybe installed).
- Piston Pins:
 - Check for clearance between pin and pin boss (if excessive, oversized pins maybe installed). If equipped with retainers, retainers are checked.
- Connecting Rods:
 - Checked for cracks, twists and bends, large ends are checked for out-of-roundness, taper and size. (If not within specifications, maybe resized. Small end, depending on type (press fit or full floating) checked for size and re-machined/bushed if necessary.)
- Camshaft (if not an overhead valve engine):
 - Check for straightness, lobe condition/lift, journal size, taper and condition.
- Related Components:
 - Check camshaft, chain, sprocket, gears for wear. Check out oil pump internal components for wear/clearances including pressure relief valve, driveshaft, screen, oil pan including plug, windage tray/baffles.

ILLUSTRATIVE EXAMPLE: Piston and Cylinder Measurement

MEC3070–3

Module Learner Expectation:	<p><i>The student will:</i></p> <ul style="list-style-type: none"> recondition a cylinder block and its related components.
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Measurement appraisal of pistons and cylinders using straight edge, feeler gauges, cylinder gauge, outside/ inside micrometers and telescopic gauges.

	PISTONS						CYLINDERS							
	Piston Ring Groove Width	Ring Side Clearance	Piston Ring Gap		Piston		Piston Pin Diameter	Pin to Boss Clearance (floating pin)	Deck Warpage	Cylinder Bore Condition	Bore Size	Bore		
			Top	Bottom	Size	Taper						Out-of-roundness	Taper	Piston to Bore Clearance
Manufacturer's Specifications														
Piston/Cylinder #1														
Piston/Cylinder #2														
Piston/Cylinder #3														
Piston/Cylinder #4														

Minimum standard for measuring accuracy: $\pm .001''$ or $\pm .025$ mm

From the above measurements, students would make a decision regarding part replacement or further service.

The above chart can be expanded to adapt to engines with more cylinders.

REFLECTIONS/COMMENTS:

ILLUSTRATIVE EXAMPLE: Crankshaft and Main Bearing Measurement

MEC3070-4

Module Learner Expectation:

The student will:

- recondition a cylinder block and its related components.

	CRANKSHAFT												CYLINDER BLOCK			
	Conrod Journal Sizes						Main Journal Sizes						Block Main Bearing Bore			
	A	B	C	D	Taper	Out-of-Roundness	A	B	C	D	Taper	Out-of-Roundness	Bore			Straightness
													Size	Taper	Out-of-Roundness	
Manufacturer's Specifications																
Journal #1																
Journal #2																
Journal #3																
Journal #4																

Minimum standard for measuring accuracy

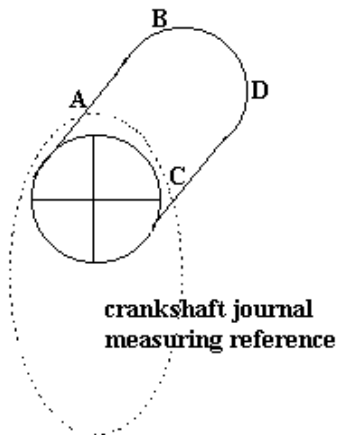
± 0.0005 inches or ± 0.0125 mm

± 0.001 or 0.025 mm

From the above obtained measurements, students would make discussions regarding part replacement or further service.

The above chart would be expanded to adapt to engines with more cylinders.

REFLECTIONS/COMMENTS:



TASK ASSESSMENT CHECKLIST: Alternate Energy Systems

MEC3080-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Historical Development <input type="checkbox"/> reports on historical developments of internal combustion engines including manufacturing techniques	3	_____
Part 2	Engine Design <input type="checkbox"/> reports on types of engine designs using alternate fuel and alternate engine designs using conventional fuel <input type="checkbox"/> reports on developments in electric powered vehicles	3	_____
Part 3	Future Developments <input type="checkbox"/> reports on possible areas of future developments in alternative propulsion systems	3	_____
Rating Scale: 4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards.</i> 3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent.</i> 2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent.</i> 1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent.</i> 0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.		REFLECTIONS/COMMENTS:	

TASK ASSESSMENT CHECKLIST: Computer Systems

MEC3090-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Computer Management System <input type="checkbox"/> identifies common principles of computer management systems <input type="checkbox"/> identifies and compares input and output devices used on vehicles with that of PCs	3	_____
Part 2	Components <input type="checkbox"/> locates CPU and input/output devices <input type="checkbox"/> describes the relationship of the CPU and its related components	3	_____
Part 3	Computer Management Operation <input type="checkbox"/> describes what and how information is gathered and processed <input type="checkbox"/> describes how changed inputs affect outputs	3	_____
Part 4	Service and Repair <input type="checkbox"/> selects and uses proper diagnostic equipment to diagnose management system <input type="checkbox"/> repairs/replaces components and evaluates system	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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TASK ASSESSMENT CHECKLIST: Safety Systems

MEC3100-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<p><i>The student:</i></p> <p>Safety Systems</p> <input type="checkbox"/> identifies need for safety systems <input type="checkbox"/> lists and describes the evolution of safety systems in vehicles <input type="checkbox"/> describes possible future developments in safety systems	3	_____
Part 2	<p>Service and Repair</p> <input type="checkbox"/> selects and uses proper equipment to diagnose safety systems <input type="checkbox"/> services and repairs safety systems to manufacturer's recommendations	3	_____
<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>		<p>REFLECTIONS/COMMENTS:</p>	

TASK ASSESSMENT CHECKLIST: Climate Control

MEC3110-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<p><i>The student:</i></p> <p>Climate Control Systems</p> <ul style="list-style-type: none"> <input type="checkbox"/> identifies parts/components of a heater system <input type="checkbox"/> identifies parts/components of air conditioning system <input type="checkbox"/> describes the function and operation of a heater and air conditioning system <input type="checkbox"/> describes how control systems combine functions to provide hot and cold air 	3	_____
Part 2	<p>Diagnosis, Service and Repair</p> <ul style="list-style-type: none"> <input type="checkbox"/> selects and uses tools to diagnose climate control systems according to manufacturer’s recommendations <input type="checkbox"/> services and repairs climate control systems to manufacturer’s recommendations 	3	_____
Part 3	<p>Environmental Concerns</p> <ul style="list-style-type: none"> <input type="checkbox"/> states the effects of refrigerants on the ecosystem <input type="checkbox"/> identifies environmental laws affecting climate control service <input type="checkbox"/> identifies alternate refrigerants indicating advantages and disadvantages 	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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TASK ASSESSMENT CHECKLIST: Power Assisting

MEC3120-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<p><i>The student:</i></p> <p>Power Assist Components</p> <ul style="list-style-type: none"> <input type="checkbox"/> identifies power assist systems. <input type="checkbox"/> identifies components of power assist system <input type="checkbox"/> outlines purpose and rationale for using power assist equipment 	3	_____
Part 2	<p>Pneumatic System</p> <ul style="list-style-type: none"> <input type="checkbox"/> selects and uses tools to diagnose pneumatic power assist system <input type="checkbox"/> selects and uses tools to service/repair pneumatic system/components to manufacturer’s recommendations 	3	_____
Part 3	<p>Hydraulic System</p> <ul style="list-style-type: none"> <input type="checkbox"/> selects and uses tools to diagnose a hydraulic power assist system <input type="checkbox"/> selects and uses tools to service/repair hydraulic system to manufacturer’s recommendations 	3	_____
Part 4	<p>Electrical System</p> <ul style="list-style-type: none"> <input type="checkbox"/> selects and uses tools to diagnose a electrical power assist system <input type="checkbox"/> selects and uses tools to service/repair electrical system to manufacturer’s recommendations 	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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TASK ASSESSMENT CHECKLIST: Automatic Transmissions

MEC3130-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<p><i>The student:</i></p> <p>Components and Function</p> <ul style="list-style-type: none"> <input type="checkbox"/> identifies components <input type="checkbox"/> traces power flow through clutches/bands in various gear selector positions <input type="checkbox"/> explains how shifting is accomplished 	3	_____
Part 2	<p>Inspection/Service/Repair</p> <ul style="list-style-type: none"> <input type="checkbox"/> selects and uses tools to diagnose faults <input type="checkbox"/> analyzes and reports on condition of transmission <input type="checkbox"/> changes transmission fluid and filter <input type="checkbox"/> adjusts linkage/bands <input type="checkbox"/> removes and replaces a transmission <input type="checkbox"/> make minor repairs to an automatic transmission 	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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TASK ASSESSMENT CHECKLIST: Drive Train Repair

MEC3140-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<p><i>The student:</i></p> <p>Clutches</p> <input type="checkbox"/> inspects clutch performance <input type="checkbox"/> replaces clutch plate/pressure plate and related components following manufacturer’s recommendations <input type="checkbox"/> makes post-installation checks and adjustments	3	_____
Part 2	<p>Standard Transmission</p> <input type="checkbox"/> inspects and determines condition of transmission <input type="checkbox"/> removes and replaces a transmission <input type="checkbox"/> disassembles and reassembles transmission <input type="checkbox"/> on a disassembled transmission, makes inspection/checks and required service/repair	3	_____
Part 3	<p>Differential</p> <input type="checkbox"/> inspects and determines condition of differential <input type="checkbox"/> selects and uses tools to inspect and adjust a differential		
Part 4	<p>Drive Axle Assembly</p> <input type="checkbox"/> selects and uses tools to inspect drive axles <input type="checkbox"/> removes and replaces drive axles <input type="checkbox"/> removes and replaces universal joint(s)	3	_____
<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>		<p>REFLECTIONS/COMMENTS:</p>	

TASK ASSESSMENT CHECKLIST: Wheel Alignment

MEC3150-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<p><i>The student:</i></p> <p>Prealignment</p> <ul style="list-style-type: none"> <input type="checkbox"/> determines customer need <input type="checkbox"/> determines condition of steering components and repair <input type="checkbox"/> determines condition of suspension components and repair <input type="checkbox"/> analyzes tire wear patterns 	3	_____
Part 2	<p>Alignment Angles</p> <ul style="list-style-type: none"> <input type="checkbox"/> identifies six alignment angles (including negative and positive where applicable) <input type="checkbox"/> identifies angle adjustment methods and procedures <input type="checkbox"/> indicates affects of incorrect angles on vehicle handling and components 	3	_____
Part 3	<p>Alignment Equipment</p> <ul style="list-style-type: none"> <input type="checkbox"/> follows accepted alignment equipment use <input type="checkbox"/> measures alignment angles on a specified vehicle <input type="checkbox"/> interprets data, compares to specifications and determines required service <input type="checkbox"/> adjusts angles to specifications 	3	_____
Part 4	<p>Post Alignment</p> <ul style="list-style-type: none"> <input type="checkbox"/> contrasts driving symptoms to prealignment conditions <input type="checkbox"/> assesses work performed, condition of vehicle, readiness for customer delivery <input type="checkbox"/> reports vehicle status to customer 	3	_____
<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>		<p>REFLECTIONS/COMMENTS:</p>	

Module Learner Expectation:*The student will:*

- identify measurements and angles used to check and adjust suspension and steering systems.

Note: Alignment angle measurement and adjustment depend on suspension and steering system incorporated in a vehicle.

**SAMPLE ITEM(S)
FOR IDENTIFICATION OF ALIGNMENT ANGLES**

- Give examples of wheel alignment angles:
 - camber (positive and negative)
 - caster (positive and negative)
 - toe (toe-in and toe-out)
 - steering axis inclination
 - toe-out on turns
 - tracking
- Make the following angle adjustments:
 - camber and caster when vehicle equipped with control arms:
 - shims between control arm and frame
 - slots for bolts between control arm and frame
 - eccentric bolt and cam on control arm
 - ball joint eccentric
 - strut rod—lower control arm (caster only)
 - camber and caster when vehicle equipped with struts:
 - slots in upper strut mount
 - eccentric bolt on spindle mount (camber only)
 - toe in or out
- Angle Adjustment Sequence:
 - caster, camber and toe-in
- Explain the effects of incorrect alignment angles on vehicle
 - Camber— tire shoulder wear, ball joint, wheel bearing wear, pulls to the side with most positive or least negative camber
 - Caster— excessive positive steering, hard steering, excessive road shock, wheel shimmy, pulls to the side with the least positive caster and excessive negative— wander and instability, pulls to the side with the most negative caster
 - Steering axis inclination— instability, poor steering wheel recovery to centre position, pulls to side with the least angle
 - Toe—tire wear
 - Toe-out-on-turns— tire wear and squeal on turns
 - Tracking— steering wheel off centre, wander

Note: Defective brakes, tires, suspension and steering components will also affect steering.

TASK ASSESSMENT CHECKLIST: Body Repair Estimation

MEC3160-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Estimating and Legal Obligations <input type="checkbox"/> defines insurance, liability, waiver, write-off premium and deductible <input type="checkbox"/> describes legal implications when estimating	3	_____
Part 2	Investigation, Vehicle Construction, Part Costs <input type="checkbox"/> selects and uses resources <input type="checkbox"/> identifies problem-solving approach to collision damage <input type="checkbox"/> identifies direct and hidden collision damage <input type="checkbox"/> identifies accessory parts <input type="checkbox"/> sources parts and prices (including original equipment manufacturer and aftermarket)	3	_____
Part 3	Estimating Procedures <input type="checkbox"/> lists the skills and knowledge required for estimating collision damage to include visual, measurement, calculation, product knowledge	3	_____
Part 4	Damage Estimate <input type="checkbox"/> applies knowledge and skills in estimating a given collision damage <input type="checkbox"/> provides a cost analysis including part, labour, shop and miscellaneous costs <input type="checkbox"/> provides a comparison between vehicle value and repair costs	3	_____
Rating Scale: 4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i> 3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i> 2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i> 1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i> 0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.		REFLECTIONS/COMMENTS:	

Module Learner Expectations

The student will: complete an estimate by determining what parts/components are to be replaced or repaired and their subsequent costs.

Damage Report on a Given Damaged Vehicle to Include:

- Zone 1:
 - Primary damage (near force of impact) to include:
 - grille, hood, fenders, quarter panels, deck lid, doors, pillars, roof, floor pans, bumper systems, component/structural supports, rails
- Zone 2:
 - Secondary damage (damage outside of Zone 1)
- Zone 3:
 - Mechanical damage to components such as:
 - radiator
 - fan
 - power steering pump
 - alternator
 - battery
 - air condition
 - reservoirs
 - engine
 - transmission
 - rear axle
 - driveshaft
 - steering
 - suspension
 - brake system
- Zone 4:
 - Passenger compartment damage to interior trim accessories including operation of all components
- Zone 5:
 - Exterior trim and finish

Estimating Parts, Labour and Miscellaneous Costs

- Use crash guides to determine labour and parts costs.
- Determining when component is repaired or replaced.
- Determining when salvage, aftermarket or original equipment manufacturer (OEM) parts are used.
- Determine the total cost of the repair.

Determining Vehicle Value Versus Repair Costs

- Determine actual vehicle cash value (ACV) using a used car guide.
- Determine whether vehicle should be repaired.

TASK ASSESSMENT CHECKLIST: Damage Analysis

MEC3170-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<p><i>The student:</i></p> <p>Safety</p> <input type="checkbox"/> follows shop safety procedures including use of personal protective equipment <input type="checkbox"/> selects and uses proper vehicle jacks and stands <input type="checkbox"/> follows safe practices in part removal/replacement	3	_____
Part 2	<p>Damage Types</p> <input type="checkbox"/> recognizes vehicle construction safety features and its effects on collision damage <input type="checkbox"/> recognizes frame types and effects of collision damage <input type="checkbox"/> locates secondary and hidden damage <input type="checkbox"/> describes methods used to determine damage	3	_____
Part 3	<p>Measuring for Analysis</p> <input type="checkbox"/> selects and uses measuring tools and equipment <input type="checkbox"/> collects data and evaluates damage <input type="checkbox"/> indicates relationship between suspension, alignment and collision damage	3	_____
Part 4	<p>Repair Strategy</p> <input type="checkbox"/> uses a repair estimate and prepares a repair strategy including procedures and proper sequence	3	_____
<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>		<p>REFLECTIONS/COMMENTS:</p>	

TASK ASSESSMENT CHECKLIST: Damage Repair 1

MEC3180-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Safety <input type="checkbox"/> follows shop safety procedures including use of proper personal protective equipment <input type="checkbox"/> selects and uses power, welding and cutting tools	3	_____
Part 2	Removal/Replacement of Parts <input type="checkbox"/> analyzes part and determines repair sequence <input type="checkbox"/> removes and installs parts and accessories as instructed <input type="checkbox"/> prepares adjacent parts/surfaces for installation	3	_____
Part 3	Alignment/Preparation <input type="checkbox"/> determines correct alignment procedure <input type="checkbox"/> aligns parts as per established procedures <input type="checkbox"/> performs preparation of parts for painting	3	_____
Part 4	Trim Parts <input type="checkbox"/> determines cost effective repair method <input type="checkbox"/> repairs or replaces trim parts as recommended	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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TASK ASSESSMENT CHECKLIST: Damage Repair 2

MEC3190-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Safety <input type="checkbox"/> follows shop safety procedures including use of proper personal protective equipment <input type="checkbox"/> selects and uses power, hydraulic, welding and cutting equipment	3	_____
Part 2	Frame, Body Construction and Repair <input type="checkbox"/> explains frame construction <input type="checkbox"/> explains unibody construction <input type="checkbox"/> explains HSS/HSLA metals characteristics <input type="checkbox"/> describes methods used to repair vehicle bodies	3	_____
Part 3	Frame/Body Straightener <input type="checkbox"/> demonstrates knowledge and use of measurement charts and parts terminology <input type="checkbox"/> uses a bench frame straightening system to measure a chassis	3	_____
Part 4	Frame/Body Straightening Analysis <input type="checkbox"/> selects and uses resources to evaluate misalignment <input type="checkbox"/> analyzes data and determines misalignment <input type="checkbox"/> explains misalignment affects on suspension geometry		
Part 5	Frame/Body Straightening <input type="checkbox"/> uses bench frame straightening system to correct alignment <input type="checkbox"/> selects and uses jacks to align frame/body <input type="checkbox"/> aligns and fabricates damaged parts	3	_____
Part 6	Suspension Alignment <input type="checkbox"/> identifies suspension problems owing to collision <input type="checkbox"/> understands legal implications when repairing structural damage	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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Module Learner Expectation:	<p><i>The student will:</i></p> <ul style="list-style-type: none"> • correct frame/body alignment involving replacement of unibody panels and use of hydraulic jacks and welders.
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<u>Assessment Components</u>	<u>Details</u>	<u>Indicator</u>
Welding/Cutting Panels	<ul style="list-style-type: none"> • cuts made as predetermined • welds correctly placed, spaced and with proper penetration 	<ul style="list-style-type: none"> • full penetration with uniform beads
Straightening Process	<ul style="list-style-type: none"> • openings for doors, hood, deck and glass to prescribed sizes • vehicle tracking 	<ul style="list-style-type: none"> • datum chart specifications • within manufacturers specifications

TASK ASSESSMENT CHECKLIST: Refinishing 2

MEC3200-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Safety <input type="checkbox"/> follows shop safety procedures and routines <input type="checkbox"/> selects and uses auto body shop materials and safety equipment <input type="checkbox"/> locates and follows instructions on WHIMIS data sheets	3	_____
Part 2	Top Coats, Solvents and Additives <input type="checkbox"/> identifies three widely used paint systems <input type="checkbox"/> identifies and describes solvents and selection process <input type="checkbox"/> identifies and explains additives and selection process	3	_____
Part 3	Refinish Application <input type="checkbox"/> applies an acrylic enamel paint system <input type="checkbox"/> applies a base/clear coat paint system	3	_____
Part 4	Problem Solving <input type="checkbox"/> identifies and solves paint product and spray application problems <input type="checkbox"/> identifies and solves refinishing equipment problems	3	_____
Rating Scale: 4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i> 3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i> 2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i> 1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i> 0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.		REFLECTIONS/COMMENTS:	

Module Learner Expectation: *The student will:*

- apply metallic, tintone and/or base/clear coat and acrylic enamel finishes.

<u>Assessment Components</u>	<u>Details</u>	<u>Tolerance</u>
Overspray	<ul style="list-style-type: none"> • evidence of wheel wells properly masked • door jams and body openings blocked for overspray 	<ul style="list-style-type: none"> • no overspray
Painted Surface Condition	<ul style="list-style-type: none"> • evidence of runs, sages, dryspray and dirt 	<ul style="list-style-type: none"> • minor evidence of two only
Detailing and Cleaning	<ul style="list-style-type: none"> • all components properly attached and adjusted • cleanliness • removal of overspray 	<ul style="list-style-type: none"> • no evidence of overlooked areas
Paint Room and General Clean-up	<ul style="list-style-type: none"> • pain room clean-up • spray equipment cleaned with air cap in solvent • waste disposed 	<ul style="list-style-type: none"> • no evidence of colour on exterior surfaces

TASK ASSESSMENT CHECKLIST: Plastic & Fibreglass

MEC3210-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Safety <input type="checkbox"/> follows shop safety procedures and routines <input type="checkbox"/> follows safe practices when working with plastics and fibreglass <input type="checkbox"/> accesses and uses WHIMIS data	3	_____
Part 2	Plastics <input type="checkbox"/> describes and determines types of plastics <input type="checkbox"/> describes repairs methods available for plastics <input type="checkbox"/> describes equipment/materials required to repair plastics	3	_____
Part 3	Plastic Repair <input type="checkbox"/> performs a plastic weld <input type="checkbox"/> performs a plastic bond	3	_____
Part 4	Fibreglass <input type="checkbox"/> describes and determines types of fibreglass materials including resins and hardeners <input type="checkbox"/> describes procedures for doing a repair	3	_____
Part 5	Fibreglass Repair <input type="checkbox"/> performs a fibreglass repair method	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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TASK ASSESSMENT CHECKLIST: Glass Replacement

MEC3220-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Safety <input type="checkbox"/> follows shop safety procedures and routines <input type="checkbox"/> follows prescribed safety procedures when handling glass <input type="checkbox"/> follows prescribed steps in disposing broken glass and glass products	3	_____
Part 2	Glass Technology <input type="checkbox"/> selects and uses glass resources and materials <input type="checkbox"/> identifies glass types and function <input type="checkbox"/> identifies glass retaining systems including moldings and seals	3	_____
Part 3	Glass Replacement Procedures <input type="checkbox"/> selects and uses resources for glass replacement <input type="checkbox"/> identifies tools and procedures for glass replacement	3	_____
Part 4	Glass Replacement <input type="checkbox"/> removes and replaces front or rear glass <input type="checkbox"/> removes and installs side glass <input type="checkbox"/> seals and tests glass installation <input type="checkbox"/> aligns door glass correctly	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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TASK ASSESSMENT CHECKLIST: Refinishing 3

MEC3230-1

STANDARD:	Students working at STANDARD must demonstrate a performance rating of 3 as specified in module criteria and conditions.
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TASK PERFORMANCE CRITERIA		Standard	Observed Rating
Part 1	<i>The student:</i> Safety <input type="checkbox"/> follows shop safety procedures and routines <input type="checkbox"/> selects and uses auto body shop materials and safety equipment <input type="checkbox"/> locates and uses WHIMIS data sheets	3	_____
Part 2	Refinish Technology <input type="checkbox"/> selects and uses refinish resources <input type="checkbox"/> explains base and clear coat systems <input type="checkbox"/> explains plastic coatings <input type="checkbox"/> explains colour matching using colour code reference	3	_____
Part 3	Refinish Application <input type="checkbox"/> explains applications of high tech paint systems <input type="checkbox"/> applies tutone, striped or custom finishes <input type="checkbox"/> cleans spray equipment and area <input type="checkbox"/> disposes waste products following accepted practices	3	_____

<p>Rating Scale:</p> <p>4 Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. <i>Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.</i></p> <p>3 Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. <i>Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.</i></p> <p>2 Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.</i></p> <p>1 Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. <i>Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services</i></p> <p>0 Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.</p>	<p>REFLECTIONS/COMMENTS:</p>
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