

Automotive Technology - Student Learning Outcomes

AU T 070	Automotive Techniques and Applications	1. Identify the major parts of an automotive brake system. ILO1, ILO3, ILO4.
		2. Explain the operating principles of steering systems. ILO1, ILO3, ILO4.
		3. Perform fundamental electrical test. ILO1, ILO3, ILO4.
AU T 075	Basic Shop Skills	1. Identify and locate the most important parts of a vehicle. (ILO1, ILO4)
		2. Identify common automotive handtools. (ILO1, ILO3, ILO4)
		3. Select the right tool for a given job. (ILO1, ILO3, ILO4)
AU T 085	Automotive Maintenance and Repair	1. Explain the interaction of automotive systems. ILO1, ILO3, ILO4.
		2. Describe the purpose of the fundamental automotive system. ILO1, ILO3, ILO4.
		3. Describe the type of skills needed to be an auto technician. ILO1, ILO3, ILO4.
AU T 110	Engine Technology	1. Identify and interpret engine concerns; determined necessary action ILO1,ILO2,ILO3
		2. Perform cylinder cranking and running compression test; determined necessary action. ILO1,ILO2,ILO3
		3. Remove cylinder head; inspect gasket condition; install cylinder head and gasket; tighten according to manufacturer's specifications and procedures. ILO1,ILO2,ILO3
		4. Disassemble engine block; clean and prepare components for inspection and reassembly. ILO1,ILO2,ILO3
AU T 120	Automotive Machine Shop	1. Describe engine size measurements based on bore, stroke, displacement, and number
		2. Explain engine compression and how it affects engine performance. ISLO1, ISLO2, ISLO4.
		3. Explain engine torque and horsepower ratings. ISLO1, ISLO2, ISLO3, ISLO4.
		4. Explain volumetric efficiency, thermal efficiency, mechanical efficiency, and total engine efficiency. ISLO1, ISLO2, ISLO4.
AU T 122	High Performance Engine Blueprinting I	1. Describe safety practices to be followed when performing engine service. (ILO1, ILO2, ILO3)
		2. Explain how to measure cylinder and piston wear. (ILO1, ILO2)
		3. Identify and interpret engine top end, and engine blueprinting system concern; determine necessary action. (ILO1, ILO2)
		4. Create an engine layout to determine engine components needed to repair with modern engine equipment. (ILO2)
AU T 125	Automotive Brakes	1. Identify and interpret brake system concern; determine necessary action. SLO1, SLO2, SLO3.
		2. Diagnose pressure concerns in the brake system using hydraulic principles. (Pascal's Law) SLO1, SLO2, SLO3.
		3. Diagnose poor stopping, noise, vibration, pulling, graving, dragging or pedal pulsation concerns; determine necessary action. SLO1, SLO2, SLO3
		4. Identify and inspect electronic brake control systems components; determine necessary action. SLO1, SLO2, SLO3.
AU T 130	Automotive Electronics I	1. Identify and interpret electrical/electronic system concern; determine necessary action. ILO1, ILO2, ILO3.
		2. Use wiring diagrams during diagnosis of electrical circuit problems. ILO1, ILO2, ILO3.
		3. Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems, including; source voltage, voltage drop, current flow, and resistance. ILO1, ILO2, ILO3.
AU T 140	Diesel Engine Maintenance and Repair	1. Define the terms that describe basic diesel engine operation. (ILO1, ILO2, ILO3)
		2. Identify the differences between a: natural aspirated engine and a manifold boosted engine. (ILO1, ILO2, ILO3)
		3. Explain how energy of the fuels is converted to kinetic energy. (ILO1, ILO2)
		4. Explain engine torque, horsepower, and rating for diesel engines. (ILO1, ILO2, ILO3)
		5. Explain volumetric efficiency, thermal efficiency, and total engine power. (ILO1, ILO2, ILO3)
AU T 150	Automotive Electronics II	1. Describe the action of basic electric circuits. ILO1, ILO3, ILO4
		2. Compare voltage, current, and resistance. ILO1, ILO3, ILO4
		3. Explain different kinds of automotive wiring. ILO1, ILO3, ILO4
		4. Perform fundamental electrical tests. ILO1, ILO3, ILO4

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AU T 155	Suspension & Wheel Alignment	1. Identify and interpret suspension and steering system concerns; determined necessary action. (ILO1, ILO2, ILO3)
		2. Diagnose steering column noises, looseness, and binding concerns (including tilt mechanisms); determine necessary action. (ILO1, ILO2, ILO3)
		3. Inspect, remove, and replace shock absorbers. (ILO1, ILO2, ILO3)
		4. Inspect tire condition; identify tire wear patterns; check and adjust air pressure; determine necessary action. (ILO1, ILO2, ILO3)
AU T 160	Engine Performance Tune-Up	1. Identify and interpret engine performance concern; determined necessary action (ILO1,ILO2,ILO3)
		2. Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze and frame data; clear codes when applicable (ILO1,ILO2,ILO3)
		3. Diagnose emissions or driveability concerns without store diagnostic trouble codes; determined necessary action (ILO1,ILO2,ILO3)
AU T 165	Diesel Preventive Maintenance And Inspection	1. Explain how to set up a diesel preventive maintenance inspection program. (ILO1, ILO2, ILO3)
		2. Explain how to set up a daily walk around inspection for diesel units. (ILO1, ILO2, ILO3)
		3. Describe the proper steps for preparing the diesel equipment for short and long term stationary storage. (ILO1, ILO2, ILO3, ILO4)
		4. Describe the use of troubleshooting charts and service information to pinpoint the source of system problems. (ILO1, ILO2, ILO3, ILO4)
AU T 170	Engine Diagnosis and Repair	1. Research applicable vehicle and service information such as engine management system operation, vehicle service history, service precautions, and service technical bulletins. (ILO1, ILO2, ILO3)
		2. Locate and interpret vehicle and major component identification numbers. (ILO1, ILO2, ILO3)
		3. Check for module communication (including CAN/BUS systems) errors using a scan tool. (ILO1, ILO2, ILO3)
AU T 180	Manual Transmissions and Power Trains	1. Identify and interpret drive train concerns; determine necessary action. (ILO1, ILO2, ILO3)
		2. Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine necessary action. (ILO1, ILO2, ILO3)
		3. Remove and reinstall transmission/transaxle. (ILO1, ILO2, ILO3)
		4. Diagnose constant-velocity (CV) joint noise and vibration concerns; determine necessary action. (ILO1, ILO2, ILO3)
AU T 210	Automotive Air Conditioning	1. Identify and interpret heating and air conditioning concern; determined necessary action. ILO1,ILO2,ILO3
		2. Perform A/C system test; identify A/C system malfunctions. ILO1,ILO2,ILO3.
		3. Diagnose A/C system conditions that cause the protection devices to interrupt system operation. ILO1,ILO2,ILO3.
AU T 220	Mechanical Automatic Transmissions	1. Diagnose fluid loss and condition concerns; check fluid level in transmissions with and without dipstick; determine necessary action. (ILO1, ILO2, ILO3)
		2. Inspect and replace external seals, gaskets, and bushings. (ILO1, ILO2, ILO3)
		3. Disassemble, clean, and inspect transmission/transaxle. (ILO1, ILO2, ILO3)
		4. Assemble transmission/transaxle. (ILO1, ILO2, ILO3)
AU T 230	Emissions Control & Computer Systems	1. Diagnose the causes of emissions or driveability concerns with store or active diagnostic trouble codes; obtain graph, and interpret scan tool data. ILO1,ILO2,ILO3.
		2. Access and use service information to perform step-by-step diagnosis. ILO1,ILO2,ILO3.
		3. Inspect and test ignition primary and secondary circuit wiring and solid state components; perform necessary action. ILO1,ILO2,ILO3.

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AU T 231	Auto Emission Control System	<p>1. Use advance diagnostic techniques to trouble-shoot difficult problems. ILO1, ILO3, ILO4.</p> <p>2. Use scan-tool snapshot and datastream values to find problems not tripping trouble codes. ILO1, ILO3, ILO4.</p> <p>3. Define the fundamental terms relating to automotive emission control. ILO1, ILO3, ILO4, ILO5.</p> <p>4. Explain the sources of air pollution. ILO1, ILO3, ILO4, ILO5.</p>
AU T 235	Auto Electrical/Electronic Instruments	<p>1. Identify and interpret Electrical/ Electronic systems concern; determine necessary</p> <p>2. Diagnose electrical/electronic integrity of series, parallel and serie-parallel circuits using principles of electricity (OHM's law). (ILO1, ILO2, ILO3)</p> <p>3. Demonstrate the proper use of a digital multimeter during diagnosis of electrical circuit problems, including: source voltage, voltage drop, current flow, and resistance. (ILO1, ILO2, ILO3)</p>
AU T 240	Diesel Engine Tune-Up	<p>1. describe the typical difference between a minor tune-up and major tune-up for diesel engines. (ILO1, ILO2, ILO3)</p> <p>2. identify all the steps or procedures to perform a diesel engine tune-up. (ILO1, ILO2, ILO3)</p> <p>3. remove and reinstall different types of diesel pumps and injectors. (ILO1, ILO2, ILO3)</p> <p>4. test, service and analyze the fuel system and electrical circuits. (ILO1, ILO2, ILO3)</p>
AU T 250	Electronic Automatic Transmissions	<p>1. Identify and interpret transmission/ transaxle concerns; determine necessary action.</p> <p>2. Perform pressure tests (including transmissions/transaxles equipped) with electronic pressure control. Determine necessary action. (ILO1, ILO2, ILO3, ILO4)</p> <p>3. Perform lock-up converter system tests; determine necessary action. (ILO1, ILO2, ILO3, ILO4)</p> <p>4. Remove and reinstall transmission/transaxle and torque converter; Inspect engine core plug rear crankshaft, dowel pins and mating surfaces. (ILO1, ILO2, ILO3, ILO4)</p>
AU T 285	Alternative Fuels for Diesel Engines	<p>1. Identify alternative fuels for diesel engines, comercial units, and farm equipment.(ILO1, ILO2, ILO3)</p> <p>2. Describe the characteristics of biodiesel fuel. (ILO1, ILO2, ILO3)</p> <p>3. Identify some of the advantages and disadvantages of alcohol?based fuels used in commercial and farm equipment. (ILO1, ILO2, ILO3)</p> <p>4. Explain the reasons why hydrogen may become the fuel of the future. (ILO1, ILO2, ILO4, ILO3)</p>