

Identifier	Poplar - Master - Automotive Technology		Introduced	Completed
M AT 1	SAFETY			
M AT 1.1.01	General Rules	Design a lab safety-improvement plan.		
M AT 2	GENERAL LAB PROCEDURES			
M AT 2.1.01	Tools and Equipment Use	Identify and explain specialty tools and equipment and their use.		
M AT 2.1.02	Tools and Equipment Use	Develop a tool inventory system.		
M AT 2.1.03	Tools and Equipment Use	Design a new specialty tool.		
M AT 2.2.01	Information	Research vehicle information and history using Internet sites, technical service bulletins (TSBs) and other resources.		
M AT 2.3.01	Customer Service	Design a comprehensive work order form.		
M AT 2.4.01	Vehicle Service	Develop a vehicle service checklist.		
M AT 3	ENGINE REPAIR			
M AT 3.1.01	General	Inspect, repair or replace the crankshaft vibration damper (harmonic balancer).		
M AT 3.1.02	General	Remove cylinder head(s); visually inspect cylinder head(s) for cracks; check gasket surface areas for warping and leakage; check passage condition.		
M AT 3.1.03	General	Adjust valves for mechanical or hydraulic lifters.		
M AT 3.1.04	General	Disassemble and identify components and reassemble an engine.		
M AT 4	AUTOMATIC TRANSMISSION			
M AT 4.1.01	Transmission/ Transaxle Service	Disassemble, inspect, measure and reassemble an automatic transmission.		
M AT 4.1.02	Transmission/ Transaxle Service	Diagnose electronic, mechanical and hydraulic vacuum control system concerns; determine necessary action.		
M AT 4.1.03	Transmission/ Transaxle Service	Inspect and replace external seals and gaskets.		
M AT 4.1.04	Transmission/ Transaxle Service	Remove and replace an automatic transmission/transaxle.		
M AT 5	MANUAL DRIVETRAIN AND AXLES			
M AT 5.1.01	Drivetrain/Axle Service	Remove and replace a manual transmission/transaxle.		
M AT 5.1.02	Drivetrain/Axle Service	Replace a front- or rear-wheel drive axle.		
M AT 5.1.03	Drivetrain/Axle Service	Disassemble, inspect, measure and reassemble an axle assembly.		
M AT 5.1.04	Drivetrain/Axle Service	Inspect and replace a clutch assembly and flywheel.		
M AT 5.1.05	Drivetrain/Axle Service	Disassemble, clean, measure and reassemble transmission/ transaxle components.		
M AT 5.1.06	Drivetrain/Axle Service	Replace a front wheel drive (FWD) front wheel bearing.		
M AT 5.1.07	Drivetrain/Axle Service	Inspect, service and replace shaft center support bearings.		
M AT 5.1.08	Drivetrain/Axle Service	Diagnose differential noise, vibration, slippage and chatter concerns; determine necessary action.		
M AT 5.1.09	Drivetrain/Axle Service	Remove and reinstall a transfer case.		
M AT 5.1.10	Drivetrain/Axle Service	Inspect and service four-wheel drive/all-wheel drive components.		
M AT 5.1.11	Drivetrain/Axle Service	Diagnose universal joint noise and vibration concerns; perform necessary action.		
M AT 6	SUSPENSION AND STEERING			
M AT 6.1.01	Systems Service	Adjust manual or power non-rack and pinion worm bearing preload and sector lash.		
M AT 6.1.02	Systems Service	Remove, inspect and replace a power steering pump.		
M AT 6.1.03	Systems Service	Remove and replace a manual or power rack and pinion steering gear; inspect mounting bushings and brackets.		
M AT 6.1.04	Systems Service	Adjust a manual or power rack and pinion steering gear.		
M AT 6.1.05	Systems Service	Diagnose, inspect, adjust, repair or replace components of electronically controlled suspension systems.		
M AT 6.1.06	Systems Service	Perform a wheel alignment.		
M AT 6.2.01	Wheels/ Tires	Identify the components of an electronic tire pressure sensing system.		
M AT 7	BRAKES			
M AT 7.1.01	Braking Systems	Inspect, test and replace components of a brake warning light system.		
M AT 7.1.02	Braking Systems	Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action.		
M AT 7.1.03	Braking Systems	Inspect and test a hydro-boost system and accumulator for leaks and proper operation; determine necessary action.		
M AT 7.1.04	Braking Systems	Depressurize high-pressure components of the antilock brake system (ABS).		
M AT 7.1.05	Braking Systems	Bleed the antilock brake system's (ABS) front and rear hydraulic circuits.		
M AT 7.1.06	Braking Systems	Diagnose antilock brake system (ABS) electronic control(s) and components using self-diagnosis and/or recommended test equipment; determine necessary action.		
M AT 7.1.07	Braking Systems	Remove, bench bleed and reinstall a master cylinder.		
M AT 7.1.08	Braking Systems	Fabricate brake lines using double flare and ISO types.		
M AT 7.2.01	Disc Brakes	Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action.		
M AT 7.3.01	Drum Brake	Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action.		
M AT 8	ELECTRICAL/ ELECTRONIC SYSTEMS			
M AT 8.1.01	Electrical Systems	Inspect and diagnose incorrect turn signal or hazard light operations; perform necessary action.		
M AT 8.1.02	Electrical Systems	Inspect and test gauges and gauge sending units for cause of intermittent, high, low or no gauge readings; determine necessary action.		
M AT 8.2.01	Batteries	Determine cold cranking amp requirements for inclement weather conditions.		
M AT 8.2.02	Batteries	Explain the difference between spiral, deep cycle and gel cell batteries.		

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M AT 8.3.01	Start/ Charge Systems	Disassemble, clean, inspect and test starter components; replace as needed.		
M AT 8.3.02	Start/ Charge Systems	Disassemble a generator (alternator) and clean, inspect and test the components; determine necessary action.		
M AT 9	HEATING AND AIR CONDITIONING			
M AT 9.1.01	Systems Knowledge	Leak test an air conditioning system; determine necessary action.		
M AT 9.1.02	Systems Knowledge	Select oil type; measure and add oil to the air conditioning system as needed.		
M AT 9.1.03	Systems Knowledge	Diagnose unusual operating noises in the air conditioning system; determine necessary action.		
M AT 9.1.04	Systems Knowledge	Diagnose air conditioning system conditions that cause the protection devices (pressure, thermal, and PCM) to interrupt system operation; determine necessary action.		
M AT 9.1.05	Systems Knowledge	Remove, inspect, troubleshoot and replace heating and air conditioning components.		
M AT 9.1.06	Systems Knowledge	Use an EPA certified recovery machine to evacuate and recharge an air conditioning system.		
M AT 10	ENGINE PERFORMANCE			
M AT 10.1.01	Diagnosis/ Repair	Diagnose unusual exhaust colors, odors and sounds; determine necessary action.		
M AT 10.1.02	Diagnosis/ Repair	Diagnose unusual engine noise or vibration concerns; determine necessary action.		
M AT 10.1.03	Diagnosis/ Repair	Diagnose engine mechanical, electrical, electronic, fuel and ignition concerns with an oscilloscope and engine diagnostic equipment; determine necessary action.		
M AT 10.1.04	Diagnosis/ Repair	Diagnose driveability and emissions problems resulting from failures of interrelated systems; determine necessary action.		
M AT 10.1.05	Diagnosis/ Repair	Remove, inspect and test vacuum and electrical circuits, components and connections of a fuel system; perform necessary action.		
M AT 10.1.06	Diagnosis/ Repair	Test the operation of turbocharger/supercharger systems; determine necessary action.		
M AT 10.1.07	Diagnosis/ Repair	Diagnose and test emission control devices.		
M AT 10.2.01	Fuel/ Ignition	Inspect, test and clean fuel injectors.		
M AT 10.2.02	Fuel/ Ignition	Remove, inspect, gap and replace spark plugs.		
M AT 10.2.03	Fuel/ Ignition	Diagnose and replace oxygen sensors.		
M AT 11	ALTERNATIVE FUELS AND VEHICLES			
M AT 11.1.01	Fuels	Demonstrate knowledge of different types and construction of electrical vehicle batteries.		
M AT 11.2.01	Vehicles	Demonstrate knowledge of different types and construction of alternative vehicles.		
M AT 12	EMPLOYABILITY SKILLS			
M AT 12.1.01	Problem Solving	Develop a flow chart to solve a problem.		
M AT 12.2.01	Speak, Write, Listen	Research, prepare and deliver an automotive-related presentation.		
M AT 12.2.02	Speak, Write, Listen	Prepare technical documents, such as work orders.		
M AT 12.2.03	Speak, Write, Listen	Compete in a SkillsUSA job skill demonstration and/or public speaking contest.		
M AT 12.3.01	Technology	Critique the use, benefits and cost of technologically advanced equipment in the automotive industry.		
M AT 12.3.02	Technology	Analyze the impact of technological changes on one or more aspects of automotive industry by researching current literature.		
M AT 12.3.03	Technology	Compete in a regional or state SkillsUSA automotive contest.		
M AT 12.3.04	Technology	Compete in the Ford/AAA Student Auto Skills Contest.		
M AT 12.4.01	Leadership and Teamwork	Analyze the stages of group development.		
M AT 12.4.02	Leadership and Teamwork	Demonstrate leadership ability within a group or team.		
M AT 12.4.03	Leadership and Teamwork	Compromise and/or build consensus within a group and summarize the decision of the group while maintaining respect for diverse viewpoints.		
M AT 12.4.04	Leadership and Teamwork	Complete levels 1-3 of the SkillsUSA Professional Development Program.		
M AT 12.4.05	Leadership and Teamwork	Campaign for a local SkillsUSA chapter office.		
M AT 12.4.06	Leadership and Teamwork	Serve as a committee chair in a local SkillsUSA chapter.		
M AT 12.5.01	Ethics	Demonstrate time-management skills and cost-effective practices.		
M AT 12.6.01	Workplace	Recognize the individual roles of team members, delegate tasks, and provide feedback on performance.		
M AT 12.6.02	Workplace	Acknowledge and utilize the skills, abilities and input of all members of a team.		
M AT 12.6.03	Workplace	Develop an action plan to accomplish tasks within a given timeframe.		
M AT 12.7.01	Career	Develop a community service or job shadowing project.		
M AT 12.7.02	Career	Develop an education/training plan to fulfill long-term career goals.		
M AT 12.7.03	Career	Define advantages and disadvantages of self-employment or working for various sizes and types of businesses.		
M AT 12.7.04	Career	Critique results of a job interview.		
M AT 12.7.05	Career	Develop a proposal for an organized community service project.		
M AT 12.7.06	Career	Compete in a local or state level SkillsUSA job interview contest.		
M AT 12.8.01	Retention	Create a plan for lifelong learning.		
M AT 12.8.02	Retention	Create a presentation illustrating interpersonal skills needed for job retention.		
M AT 12.8.03	Retention	Adapt new knowledge and skills in changing situations.		
M AT 12.8.04	Retention	Analyze how work life is affected by families and how families are affected by work life.		