Standards Correlations
Automotive Technology III (8508)

Task	SOL
REQUIRED SUPPLEMENTAL TASKS: Practicing Safety	
Identify general lab safety rules and procedures.	English: 12.5 History and Social Science: GOVT.16 Science: CH.1
Utilize safe procedures for handling tools and equipment.	English: 12.5 History and Social Science: GOVT.16
Identify and use proper placement of floor jacks and jack stands.	English: 12.5 History and Social Science: GOVT.16
Identify and use proper procedures for safe lift operation.	English: 12.5 History and Social Science: GOVT.16
Use proper ventilation procedures for working in the lab area.	History and Social Science: GOVT.16
Identify marked safety areas.	English: 12.1, 12.5 History and Social Science: GOVT.16
Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.	English: 12.5 History and Social Science: GOVT.16 Science: CH.1
Identify the location and use of eye wash stations.	English: 12.1, 12.5 History and Social Science: GOVT.16 Science: CH.1
Identify the location of posted evacuation routes.	English: 12.5 History and Social Science: GOVT.16 Science: CH.1
Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab activities.	History and Social Science: GOVT.16 Science: CH.1

Task	SOL
Identify and wear appropriate clothing for lab activities.	English: 12.5 History and Social Science: GOVT.16 Science: CH.1
Secure hair and jewelry for lab activities.	History and Social Science: GOVT.16 Science: CH.1
Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high-voltage circuits.	English: 12.5 History and Social Science: GOVT.16
Demonstrate awareness of the safety aspects of high-voltage circuits such as high intensity discharge (HID) lamps, ignition systems, and injection systems.	English: 12.5 History and Social Science: GOVT.16
Locate and demonstrate knowledge of safety data sheets (SDS).	English: 12.5 History and Social Science: GOVT.1, GOVT.16 Science: CH.1
ENGINE REPAIR: General-Engine Diagnosis, Removal, and Reinstallation (R&R)	
Complete a work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	English: 12.5
Inspect, remove, and/or replace engine mounts.	English: 12.5
ENGINE REPAIR: Cylinder Head and Valve Train Diagnosis and Repair	
Remove the cylinder head; inspect the gasket condition; install the cylinder head and gasket and tighten, according to manufacturer's specifications and procedures.	
Clean and visually inspect a cylinder head for cracks; check gasket surface areas for warpage and surface finish; check the passage condition.	
Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness, and blocked oil passages; determine the necessary action.	

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Inspect and replace the camshaft and drive belt/chain; verify the correct camshaft timing.	English: 12.5
Establish the camshaft position sensor indexing.	English: 12.5
ENGINE REPAIR: Engine Block Assembly Diagnosis and Repair	
Remove, inspect, and/or replace the crankshaft vibration damper (harmonic balancer).	English: 12.5
ENGINE REPAIR: Lubrication and Cooling Systems Diagnosis and Repair	
Remove and replace the radiator.	English: 12.5
Inspect and test fan(s), fan clutch (electrical or mechanical), fan shroud, and air dams; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Perform oil pressure tests; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Inspect auxiliary coolers; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Inspect, test, and replace oil temperature and pressure switches and sensors.	English: 12.5
AUTOMATIC TRANSMISSION AND TRANSAXLE: General-Transmission and Transaxle Diagnosis	
Identify and interpret transmission/transaxle concern, differentiate between engine performance and transmission/transaxle concerns; determine the necessary action.	English: 12.5 History and Social Science: GOVT.1
Diagnose fluid loss and condition concerns; determine the necessary action.	English: 12.5 History and Social Science: GOVT.1
Perform a stall test; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Perform lock-up converter system tests; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Diagnose transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles.	English: 12.5

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Diagnose pressure concerns in a transmission, using hydraulic principles (Pascal's law).	English: 12.5 Mathematics: AII.10
AUTOMATIC TRANSMISSION AND TRANSAXLE: In-Vehicle Transmission/Transaxle Maintenance and Repair	
Inspect, test, adjust, repair, and/or replace electrical/electronic components and circuits.	
AUTOMATIC TRANSMISSION AND TRANSAXLE: Off-Vehicle Transmission and Transaxle Repair	
Remove and reinstall the transmission/transaxle and torque converter; inspect the engine core plugs, rear crankshaft seal, dowel pins, dowel pin holes, and mounting surfaces.	
Inspect, leak test, flush, and/or replace transmission/transaxle oil cooler, lines, and fittings.	
Inspect the converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore.	
MANUAL DRIVE TRAIN AND AXLES: General-Drive Train Diagnosis	
Identify and interpret drive train concerns; determine the needed action.	History and Social Science: GOVT.1
MANUAL DRIVE TRAIN AND AXLES: Clutch Diagnosis and Repair	
Diagnose the clutch noise, binding, slippage, pulsation, and chatter; determine the needed action.	History and Social Science: GOVT.1
Inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; determine the needed action.	History and Social Science: GOVT.1
Inspect and/or replace the clutch pressure plate assembly, clutch disc, release (throw-out) bearing, linkage, and pilot bearing/bushing (as applicable).	
Bleed the clutch hydraulic system.	
Check and adjust the clutch master cylinder fluid level; check for leaks; use the proper fluid type per manufacturer specification.	

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Inspect the flywheel and ring gear for wear and cracks; determine the needed action.	History and Social Science: GOVT.1
Measure flywheel runout and crankshaft end play; determine the needed action.	English: 12.1 History and Social Science: GOVT.1
MANUAL DRIVE TRAIN AND AXLES: Transmission/Transaxle Diagnosis and Repair	
Inspect, adjust, lubricate, and/or replace shift linkages, brackets, bushings, cables, pivots, and levers.	
MANUAL DRIVE TRAIN AND AXLES: Drive Shaft and Half Shaft, Universal and Constant-Velocity (CV) Joint Diagnosis and Repair (Front, Rear, All-Wheel, and Four-Wheel Drive)	
Diagnose constant-velocity (CV) joint noise and vibration concerns; determine the necessary action.	History and Social Science: GOVT.1
Diagnose universal joint noise and vibration concerns; perform the necessary action.	History and Social Science: GOVT.1
Check shaft balance and phasing; measure shaft runout; measure and adjust driveline angles.	
MANUAL DRIVE TRAIN AND AXLES: Drive Axle Diagnosis and Repair-Ring and Pinion Gears and Differential Case Assembly	
Inspect and replace the companion flange and/or pinion seal; measure the companion flange runout.	
MANUAL DRIVE TRAIN AND AXLES: Drive Axles	
Remove and replace drive axle shafts.	English: 12.5
Inspect and replace the drive axle shaft seals, bearings, and retainers.	
Measure the drive axle flange runout and shaft end play; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Demonstrate knowledge of the drive pinion and ring gear service and set up including depth, preload, backlash, and gear tooth contact.	
MANUAL DRIVE TRAIN AND AXLES: Four-Wheel Drive/All-Wheel Drive Component Diagnosis and Repair	
Inspect, adjust, and repair the shifting controls (e.g., mechanical, electrical, and	

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vacuum), bushings, mounts, levers, and brackets.	
Identify concerns related to variations in tire circumference and/or final drive ratios.	English: 12.5
SUSPENSION AND STEERING: Steering Systems Diagnosis and Repair	
Disable and enable SRS; verify the indicator lamp operation.	English: 12.5
Remove and replace the steering wheel; center/time the SRS coil (clock spring).	English: 12.5
Diagnose steering column noises, looseness, and binding concerns (including tilt/telescoping mechanisms); determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Diagnose power steering gear (i.e., non-rack-and-pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Diagnose power steering gear (i.e., rack-and-pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Inspect the steering shaft universal joint(s), flexible coupling(s), collapsible column, lock-cylinder mechanism, and steering wheel; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Remove and replace the rack-and-pinion steering gear; inspect mounting bushings and brackets.	English: 12.5
Remove and reinstall the power steering pump.	English: 12.5
Remove and reinstall the press fit power steering pump pulley; check the pulley and belt alignment.	
Inspect, remove, and/or replace the pitman arm, relay (center link/intermediate) rod, idler arm, mountings, and steering linkage damper.	
Inspect, replace, and/or adjust tie rod ends (sockets), tie rod sleeves, and clamps.	English: 12.5
SUSPENSION AND STEERING: Suspension System Diagnosis and Repair	
Diagnose short- and long-arm suspension system noises, body sway, and uneven ride height concerns; determine the needed action.	English: 12.5 History and Social Science: GOVT.1

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Diagnose strut suspension system noises, body sway, and uneven ride height concerns; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Inspect, remove and/or replace upper and lower control arms, bushings, shafts, and rebound bumpers.	English: 12.5
Inspect, remove, and/or replace strut rods and bushings.	English: 12.5
Inspect, remove and/or replace steering knuckle assemblies.	English: 12.5
Inspect, remove, and/or replace short- and long-arm suspension system coil springs and spring insulators.	English: 12.5
Inspect, remove, and/or replace torsion bars and mounts.	English: 12.5
Inspect, remove, and/or replace the front/rear stabilizer bar (sway bar) bushings, brackets, and links.	English: 12.5
Inspect, remove, and/or replace the strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount.	English: 12.5
Inspect the rear suspension system leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts, and mounts.	English: 12.5
SUSPENSION AND STEERING: Related Suspension and Steering Service	
Remove, inspect, service, and/or replace the front and rear wheel/hub bearings.	English: 12.5
SUSPENSION AND STEERING: Wheel Alignment Diagnosis, Adjustment, and Repair	
Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Prepare the vehicle for wheel alignment on an alignment machine; perform four-wheel alignment by checking and adjusting the front and rear wheel caster, camber, and toe as required; center the steering wheel.	English: 12.5
Check toe-out on turns (i.e., turning radius); determine the needed action.	English: 12.5 History and Social Science: GOVT.1

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Check the steering axis inclination (SAI) and included angle; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Check the rear-wheel thrust angle; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Check for front-wheel setback; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Check the front and/or rear cradle (subframe) alignment; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
SUSPENSION AND STEERING: Wheels and Tires Diagnosis and Repair	
Diagnose the wheel/tire vibration, shimmy, and noise; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Measure the wheel, tire, axle flange, and hub runout; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Diagnose tire pull problems; determine the needed action.	History and Social Science: GOVT.1
BRAKES: Hydraulic System Diagnosis and Repair	
Diagnose pressure concerns in the brake system using hydraulic principles (Pascal's law).	
Remove, bench bleed, and reinstall the master cylinder.	
Diagnose poor stopping, pulling, or dragging concerns caused by malfunctions in the hydraulic system; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Replace brake lines, hoses, fittings, and supports.	
Fabricate brake lines, using the proper material and flaring procedures (e.g., double flare and International Standards Organization [ISO] types).	
Inspect, test, and/or replace components of the brake warning light system.	
BRAKES: Disc and Drum Brake Diagnosis and Repair	
Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pedal pulsation concerns in drum brakes; determine the needed action.	

Task	SOL
Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pulsation concerns in disc brakes; determine the needed action.	History and Social Science: GOVT.1
BRAKES: Power-Assist Units Diagnosis and Repair	
Inspect a vacuum-type power booster unit for leaks; inspect the check-valve for proper operation; determine the needed action.	History and Social Science: GOVT.1
Inspect and test a hydraulically assisted power brake system for leaks and proper operation; determine the needed action.	History and Social Science: GOVT.1
BRAKES: Related Systems (i.e., Wheel Bearings, Parking Brakes, Electrical) Diagnosis and Repair	
Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine the needed action.	History and Social Science: GOVT.1
Remove, reinstall, and/or replace a sealed wheel bearing assembly.	English: 12.5
ELECTRICAL/ELECTRONIC SYSTEMS: Diagnosis and Repair	
Diagnose the cause(s) of excessive key-off battery drain (i.e., parasitic draw); determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Diagnose a no-crank condition using a wiring diagram and test equipment.	English: 12.5, 12.8
Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition.	English: 12.5 History and Social Science: GOVT.1
Diagnose (troubleshoot) the charging system for causes of undercharge, no-charge, or overcharge conditions.	English: 12.5 History and Social Science: GOVT.1
Diagnose (troubleshoot) the causes of brighter-than-normal, intermittent, dim, or no light operation; determine the necessary action.	History and Social Science: GOVT.1
ELECTRICAL/ELECTRONIC SYSTEMS: Instrument Cluster and Driver Information Systems Diagnosis and Repair	
Inspect and test gauges and gauge-sending units for causes of abnormal readings; determine the needed action.	History and Social Science: GOVT.1
Diagnose (troubleshoot) the causes of incorrect operation of warning devices and	English: 12.5 History and Social Science: GOVT.1

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other driver information systems; determine the needed action.	
ELECTRICAL/ELECTRONIC SYSTEMS: Body Electrical Systems Diagnosis and Repair	
Describe the operation of comfort and convenience accessories and related circuits; determine the needed repairs.	English: 12.5 History and Social Science: GOVT.1
Describe the operation of security/anti-theft systems and related circuits (e.g., theft deterrent, door locks, remote keyless entry, remote start, and starter/fuel disable); determine the needed repairs.	English: 12.5 History and Social Science: GOVT.1
Describe the operation of entertainment and related circuits (e.g., radio, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine the needed repairs.	English: 12.5 History and Social Science: GOVT.1
Describe the operation of safety systems and related circuits; determine the needed repairs.	English: 12.5 History and Social Science: GOVT.1
Describe body electronic systems circuits using a scan tool; check for module communication errors (data bus systems); determine the needed action.	History and Social Science: GOVT.1
Describe the process for software transfer, software updates, or reprogramming of electronic modules.	English: 12.5
HEATING, VENTILATION, AND AIR CONDITIONING (HVAC): General-Air Conditioning (AC) System Diagnosis and Repair	
Identify and interpret heating and air conditioning problems; determine the needed action.	History and Social Science: GOVT.1
Identify the steps for testing AC systems and identifying problems.	English: 12.5 History and Social Science: GOVT.1
Identify abnormal operating noises in the AC system; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Identify the refrigerant type; select and connect the proper gauge set/test equipment; record the temperature and pressure readings.	English: 12.5 History and Social Science: GOVT.1, GOVT.7, GOVT.9, GOVT.15

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Leak test the AC system; determine the needed action.	English: 12.5 History and Social Science: GOVT.1, GOVT.7, GOVT.9, GOVT.15
Inspect the condition of refrigerant oil removed from an AC system; determine the needed action.	English: 12.5 History and Social Science: GOVT.1, GOVT.7, GOVT.9, GOVT.15
Determine the recommended oil and oil capacity for system application.	English: 12.5 History and Social Science: GOVT.1
Observe and record related HVAC data and trouble codes, using a scan tool.	History and Social Science: GOVT.1
HEATING, VENTILATION, AND AIR CONDITIONING (HVAC): Refrigeration System Component Diagnosis and Repair	
Inspect, test, service, and/or replace the AC compressor clutch components and/or assembly; check the compressor clutch air gap; adjust as needed.	English: 12.5 History and Social Science: GOVT.1, GOVT.7, GOVT.9, GOVT.15
Remove, inspect, and reinstall the AC compressor and mountings; determine the recommended oil type and quantity.	English: 12.5 History and Social Science: GOVT.1, GOVT.7, GOVT.9, GOVT.15
Determine the need for an additional AC system filter.	English: 12.5
Remove and inspect AC system mufflers, hoses, lines, fittings, O-rings, seals, and service valves; determine the needed action.	English: 12.5 History and Social Science: GOVT.1, GOVT.7, GOVT.9, GOVT.15
Remove, inspect, and reinstall a receiver/drier or accumulator/drier and condenser; determine the recommended oil type and quantity.	History and Social Science: GOVT.1, GOVT.7, GOVT.9, GOVT.15
Remove, inspect, and install an expansion valve or orifice (expansion) tube.	History and Social Science: GOVT.1, GOVT.7, GOVT.9, GOVT.15
Inspect the evaporator housing water drain; determine the needed action.	History and Social Science: GOVT.1
Determine the procedure to remove and reinstall the evaporator; determine the required oil type and quantity.	English: 12.5
HEATING, VENTILATION, AND AIR CONDITIONING (HVAC): Operating Systems and Related Controls Diagnosis and Repair	
Inspect and test HVAC system blower motors, resistors, switches, relays, wiring,	English: 12.5

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and protection devices; determine the needed action.	History and Social Science: GOVT.1
Diagnose HVAC system clutch control systems; determine the needed action.	History and Social Science: GOVT.1
Diagnose malfunctions in the vacuum, mechanical, and electrical components and controls of the HVAC system; determine the needed action.	History and Social Science: GOVT.1
Inspect and test HVAC system control panel assembly; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Inspect and test HVAC system control cables, motors, and linkages; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Inspect HVAC system ducts, doors, hoses, cabin filters, and outlets; determine the needed action.	History and Social Science: GOVT.1
Check operation of automatic or semi-automatic HVAC control systems; determine needed action.	English: 12.5 History and Social Science: GOVT.1
HEATING, VENTILATION, AND AIR CONDITIONING (HVAC): Refrigerant Recovery, Recycling, and Handling	
Use and maintain refrigerant handling equipment, according to equipment manufacturer's standards.	English: 12.5 History and Social Science: GOVT.1, GOVT.7, GOVT.9, GOVT.15
Identify AC system refrigerant; test for sealants; recover, evacuate, and charge the AC system; add refrigerant oil as required.	History and Social Science: GOVT.1, GOVT.7, GOVT.9, GOVT.15
Recycle, label, and store the refrigerant.	History and Social Science: GOVT.1, GOVT.7, GOVT.9, GOVT.15
ENGINE PERFORMANCE: General-Engine Diagnosis	
Identify and interpret engine performance concerns; determine needed action.	English: 12.1 History and Social Science: GOVT.1
Diagnose abnormal engine noises or vibration concerns; determine the needed action.	History and Social Science: GOVT.1
Diagnose the cause of excessive oil consumption and unusual exhaust color, odor, and sound; determine the needed action.	English: 12.5 History and Social Science: GOVT.1

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Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns; determine the needed action.	History and Social Science: GOVT.1
ENGINE PERFORMANCE: Computerized Controls Diagnosis and Repair	
Access and use service information to perform step-by-step (troubleshooting) diagnosis.	English: 12.5
Perform active tests of actuators using a scan tool; determine the needed action.	History and Social Science: GOVT.1
ENGINE PERFORMANCE: Ignition System Diagnosis and Repair	
Diagnose (troubleshoot) ignition system-related problems such as no-starting, hard starting, engine misfire, poor drivability, spark knock, power loss, poor mileage, and emissions concerns; determine the needed action.	History and Social Science: GOVT.1
Inspect and test crankshaft and camshaft position sensor(s); determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Inspect, test, reprogram, recalibrate, and/or replace the ignition control module and the powertrain/engine control module; reprogram/initialize as needed.	English: 12.5 History and Social Science: GOVT.1
ENGINE PERFORMANCE: Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair	
Check fuel for contaminants; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Inspect and test fuel pumps and pump control systems for pressure, regulation, and volume; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Inspect throttle body, air induction system, intake manifold, and gaskets for vacuum leaks and/or unmetered air.	
Inspect test, and/or replace fuel injectors.	
Verify idle control operation.	English: 12.5
Perform exhaust system back-pressure test; determine the needed action.	History and Social Science: GOVT.1
ENGINE PERFORMANCE: Emissions Control Systems Diagnosis and Repair	
Diagnose oil leaks, emissions, and drivability concerns caused by the positive	History and Social Science: GOVT.1

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crankcase ventilation (PCV) system; determine the needed action.	
Diagnose emissions and drivability concerns caused by the exhaust gas recirculation (EGR) system; inspect, test, service, and/or replace components of electrical/electronic sensors, controls, wiring, tubing, exhaust passages, vacuum/pressure controls, filters, and hoses of EGR system; determine the necessary action.	English: 12.5 History and Social Science: GOVT.1
Inspect and test electrical/electronically operated components and circuits of secondary air-injection systems; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Diagnose emission and drivability concerns caused by the catalytic converter system; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Inspect and test components and hoses of the evaporative emissions control (EVAP) system; determine the needed action.	English: 12.5 History and Social Science: GOVT.1
Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine the needed action.	English: 12.5 History and Social Science: GOVT.1