ASE Education Foundation
Automobile Program Standards
2024 Revisions

The following sections of the ASE Automobile Program Standards were reviewed and revised by a panel of industry and education subject matter experts at a review meeting held February 20-22, 2024, in Sterling, VA. To see the changes in detail, refer to the redline copy of this document.

- **Assumptions, Foundational Tasks, and Workplace Employability Skills**

Assumptions
A task is a psychomotor or cognitive entry-level learning activity consisting of one or more measurable steps accomplished through an instructor presentation, demonstration, visualization, or a student application.

Theory instruction and hands-on performance of all the basic tasks will provide initial training for entry-level employment in the automotive service field or prepare the student for further training. Competency in the tasks will indicate to employers that the graduate has the skills needed for entry-level employment in the automotive service field.

1. It is assumed that:
   - at all levels of accreditation, appropriate theory, safety, and support instruction will be required for performing each task;
   - the instruction has included identification and use of appropriate tools and testing and measurement equipment required to accomplish certain tasks;
   - the program has access to appropriate vehicles, components, and training aids needed for effective completion of tasks included in the program's curriculum;
   - the student has received the necessary training to locate and use current reference and training materials from accepted industry publications and resources; and
   - at all levels of accreditation, the student has developed an understanding of workflow documentation (written or electronic), including the ability to create and update work/repair orders, warranty reports, and inspection reports, to include information regarding problem resolution and the results of the work performed for the customer and manufacturer. This process will incorporate the "Three C's" (concern, cause, and correction) as a format to communicate this information.

2. It is assumed that:
   - all diagnostic and repair tasks described in this document are to be accomplished in accordance with manufacturer's recommended procedures and safety precautions as published,

3. It is assumed that:
   - individual courses of study will differ across automobile technician training programs;
   - development of appropriate learning delivery systems and tests which monitor student progress will be the responsibility of the individual training program;

- individual training programs being evaluated for accreditation should document performance standards for each task covered and taught in the curriculum;
- the learning progress of students will be monitored and evaluated against these performance standards; and
- a system is in place that informs all students of their individual progress through all phases of the training program.

4. It is assumed that:
   - all students will receive instruction in the storage, handling, and use of Hazardous Materials as required in Hazard Communication Title 29, Code of Federal Regulations Part 1910.1200, "Right to Know Law", and state and local requirements; and
   - hazardous and toxic materials will be handled, removed, and recycled or disposed of according to federal, state, and local regulations.

5. It is assumed that:
   - all required Foundational Tasks and Workplace Skills are being taught; and
   - programs teach all eight (8) areas of automotive technology included in the task list.

Foundational Tasks
Each of these tasks are required to be included at all levels of accreditation.

<u>Shop and Personal Safety</u>

1. Identify general lab/shop safety rules and procedures.
2. Utilize safe procedures for handling of tools and equipment.
3. Identify and use proper placement of floor jacks and jack stands.
4. Identify and use proper procedures for safe lift operation, ensuring that the configuration and weight rating of the lift is appropriate for the vehicle being lifted, including xEVs.
5. Utilize proper ventilation procedures for working within the lab/shop area.
6. Identify marked safety areas.
7. 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.
8. Identify the location and use of eye wash stations.
9. Identify the location of the posted evacuation routes.
10. Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.
11. Identify and wear appropriate clothing for lab/shop activities.
12. Secure hair and jewelry for lab/shop activities.
13. Identify vehicle systems which pose a safety hazard during service such as: supplemental restraint systems (SRS), electronic brake control systems, stop/start systems, and remote start systems.
14. Identify vehicle systems which pose a safety hazard during service due to high voltage such as: xEV drivetrains, lighting systems, ignition systems, A/C systems, injection systems, etc.
15. Locate and demonstrate knowledge of safety data sheets (SDS).
16. Demonstrate knowledge of personal protective equipment (PPE) required for use in high voltage/electric vehicle circuits.

xEV Safety

1. Demonstrate knowledge of hazards related to high voltage systems/electric vehicles, including electrocution, fire, explosion, arc flash, gases and fumes, hazardous chemicals, and EMF, and how to properly respond to emergency situations.
2. Demonstrate knowledge of high voltage system and component coloring, warning labels, lights, signage, and lock-out/tag-out procedures.
3. Demonstrate ability to identify which components and circuits contain high voltage.
4. Demonstrate knowledge of steps needed to assess possible hazards prior to servicing a high voltage/electric vehicle, including awareness of automatic systems that may operate while the key switch/ignition is off.
5. Understand limitations on which systems, components, and circuits of a high voltage/electric vehicle a technician is capable of safely servicing based on their level of training and qualification.
6. Demonstrate knowledge of high voltage/electric vehicle intake process, inspection, handling, and in-process monitoring for all vehicles, including damaged/compromised vehicles.

Tools and Equipment

1. Identify tools and their usage in automotive applications.
2. Identify standard and metric designation.
3. Demonstrate safe handling and use of appropriate tools.
4. Demonstrate proper cleaning, storage, and maintenance of tools and equipment.
5. Demonstrate proper use of precision measuring tools (e.g., micrometer, dial-indicator, dial-caliper).
6. Perform common fastener and thread repair, including removing broken bolts, restoring internal and external threads, and repairing internal threads with a thread insert.

Preparing for Vehicle Service

1. Identify information needed and the service requested on a repair order.
2. Identify purpose and demonstrate proper use of vehicle protection such as: fender covers, mats, seat, and steering wheel covers.
3. Perform a vehicle walk-around inspection; identify and document existing vehicle conditions such as body damage, paint damage, windshield damage, etc.
4. Perform a vehicle multi-point inspection and complete a vehicle inspection report (written and/or electronic).
5. Demonstrate use of the three C's (concern, cause, and correction).
6. Create a plan of action for each specific service or diagnostic situation, including placing the vehicle in service mode as required.
7. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

Preparing Vehicle for Customer

1. Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).

Workplace Employability Skills
Each of these skills are required to be included at all levels of accreditation.

Personal Standards (see Standard 7.7)
All training activities and instructional material should emphasize the importance of maintaining high personal standards. While these skills should be integrated in instruction, they are not required to be individually measured by student for the purposes of program accreditation. The classroom/lab can be considered the equivalent of a workplace and classmates can be considered coworkers.

1. Reports to work daily on time; able to take directions and motivated to accomplish the task at hand.
2. Dresses appropriately and uses language and manners suitable for the workplace.
3. Maintains personal hygiene appropriate for the workplace.
4. Meets and maintains employment eligibility criteria, such as drug/alcohol-free status, clean driving record, etc.
5. Demonstrates honesty, integrity, and reliability.

Work Habits / Ethic (see Standard 7.8)
The training program should be organized in such a manner that work habits and ethical practices required on the job are an integral part of the instruction. While these skills should be integrated in instruction, they are not required to be individually measured by student for the purposes of program accreditation. The classroom/lab can be considered a workplace and classmates can be considered coworkers.

1. Complies with workplace policies/laws, including proper and responsible use of personal electronic devices.
2. Contributes to the success of the team, assists others and requests help when needed.
3. Works well with all customers and coworkers.
4. Negotiates solutions to interpersonal and workplace conflicts.
5. Contributes ideas and initiative.
6. Follows directions.
7. Communicates effectively, both in writing and verbally, with customers and coworkers.
8. Reads and interprets workplace documents; writes clearly and concisely.
9. Analyzes and resolves problems that arise in completing assigned tasks.
10. Organizes and implements a productive plan of work.
11. Uses scientific, technical, engineering and mathematics (STEM) principles and reasoning to accomplish assigned tasks.
12. Identifies and addresses the needs of all customers, providing helpful, courteous, and knowledgeable service and advice as needed.
13. Respectful of tools and property used in school and workplace environment.
14. Contributes to an inclusive environment where every coworker and customer feels welcomed, heard, and valued.

- **Task List and Specialty Tools – see side-by-side charts below**

ASE AUTOMOBILE ACCREDITATION TASK LIST – ENGINE REPAIR – 2024					
For every task in Engine Repair, the following safety requirement must be strictly enforced:					
Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.					
Maintenance & Light Repair (MLR)		**Automobile Service Technology (AST)**		**Master Automobile Service Technology (MAST)**	
540 Hours		**840 Hours**		**1200 Hours**	
I. ENGINE REPAIR		**I. ENGINE REPAIR**		**I. ENGINE REPAIR**	
A. General		**A. General**		**A. General**	
1. Research vehicle service information such as fluid type, internal combustion engine operation, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, internal combustion engine operation, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, internal combustion engine operation, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1
2. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	2. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	2. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1
3. Verify operation of the instrument panel engine warning indicators.	P-1	3. Verify operation of the instrument panel engine warning indicators.	P-1	3. Verify operation of the instrument panel engine warning indicators.	P-1
4. Inspect engine assembly for fuel, oil, coolant, and other leaks.	P-1	4. Inspect engine assembly for fuel, oil, coolant, and other leaks; determine needed action.	P-1	4. Inspect engine assembly for fuel, oil, coolant, and other leaks; determine needed action.	P-1
5. Install engine covers using gaskets, seals, and sealers as required.	P-2	5. Install engine covers using gaskets, seals, and sealers as required.	P-1	5. Install engine covers using gaskets, seals, and sealers as required.	P-1

6. Demonstrate knowledge of the procedure for verifying engine mechanical timing.	P-2	6. Verify engine mechanical timing.	P-1	6. Verify engine mechanical timing.	P-1
7. Inspect engine mounts.	P-2	7. Inspect, remove, and/or replace engine mounts.	P-2	7. Inspect, remove, and/or replace engine mounts.	P-2
8. Identify service precautions related to service of the internal combustion engine of an xEV.	P-2	8. Identify service precautions related to service of the internal combustion engine of an xEV.	P-1	8. Identify service precautions related to service of the internal combustion engine of an xEV.	P-1
				9. Remove and reinstall engine on a vehicle equipped with OBDII; reconnect all attaching components and restore the vehicle to running condition.	P-3
I. ENGINE REPAIR		**I. ENGINE REPAIR**		**I. ENGINE REPAIR**	
B. Cylinder Head and Valve Train		**B. Cylinder Head and Valve Train**		**B. Cylinder Head and Valve Train**	
1. Identify cylinder head and valve train components and configurations.	P-1	1. Identify cylinder head and valve train components and configurations.	P-1	1. Identify cylinder head and valve train components and configurations.	P-1
		2. Remove cylinder head; inspect gasket condition; install cylinder head and gasket; tighten according to manufacturer's specification and procedure.	P-1	2. Remove cylinder head; inspect gasket condition; install cylinder head and gasket; tighten according to manufacturer's specification and procedure.	P-1
		3. Clean and visually inspect a cylinder head for cracks; check gasket surface areas for warpage and surface finish; check passage condition.	P-2	3. Clean and visually inspect a cylinder head for cracks; check gasket surface areas for warpage and surface finish; check passage condition.	P-2
		4. Inspect valve actuating mechanisms for wear, bending, cracks, looseness, and blocked oil passages (orifices); determine needed action.	P-2	4. Inspect valve actuating mechanisms for wear, bending, cracks, looseness, and blocked oil passages (orifices); determine needed action.	P-1

		5. Adjust valves (mechanical or hydraulic lifters).	P-2	5. Adjust valves (mechanical or hydraulic lifters).	P-2
		6. Inspect and replace camshaft and drive belt/chain; includes checking drive gear wear and backlash, end play, sprocket and chain wear, overhead cam drive sprocket(s), drive belt(s), belt tension, tensioners, camshaft reluctor ring/tone-wheel, and valve timing/variable lift components; verify correct camshaft timing.	P-1	6. Inspect and replace camshaft and drive belt/chain; includes checking drive gear wear and backlash, end play, sprocket and chain wear, overhead cam drive sprocket(s), drive belt(s), belt tension, tensioners, camshaft reluctor ring/tone-wheel, and valve timing/variable lift components; verify correct camshaft timing.	P-1
				7. Inspect valve springs for squareness and free height comparison; determine needed action.	P-3
				8. Replace valve stem seals on an assembled engine; inspect valve spring retainers, locks/keepers, and valve lock/keeper grooves; determine needed action.	P-3
				9. Inspect valve guides for wear; check valve stem-to-guide clearance; determine needed action.	P-3
				10. Inspect valves and valve seats; determine needed action.	P-3
				11. Check valve spring assembled height and valve stem height; determine needed action.	P-3

				12. Inspect valve lifters and hydraulic lash adjusters; determine needed action.	P-2
				13. Inspect and/or measure camshaft for runout, journal wear and lobe wear.	P-3
				14. Inspect camshaft bearing surface for wear, damage, out-of-round, and alignment; determine needed action.	P-3
I. ENGINE REPAIR		**I. ENGINE REPAIR**		**I. ENGINE REPAIR**	
C. Engine Block Assembly		**C. Engine Block Assembly**		**C. Engine Block Assembly**	
1. Identify engine block assembly components and configurations.	P-1	1. Identify engine block assembly components and configurations.	P-1	1. Identify engine block assembly components and configurations.	P-1
		2. Remove, inspect, and/or replace crankshaft vibration damper (harmonic balancer).	P-2	2. Remove, inspect, and/or replace crankshaft vibration damper (harmonic balancer).	P-1
				3. Disassemble engine block; clean and prepare components for inspection and reassembly.	P-2
				4. Inspect engine block for visible cracks, passage condition, core and galley plug condition, and surface warpage; determine needed action.	P-2
				5. Inspect and measure cylinder walls/sleeves for damage, wear, and ridges; determine needed action.	P-2
				6. Perform deglazing and cleaning of cylinder walls.	P-2

				7. Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine needed action.	P-2
				8. Inspect crankshaft for straightness, journal damage, keyway damage, thrust flange and sealing surface condition, and visual surface cracks; check oil passage condition; measure end play and journal wear; check crankshaft position sensor reluctor ring (where applicable); determine needed action.	P-2
				9. Inspect main and connecting rod bearings for damage and wear; determine needed action.	P-2
				10. Identify piston and bearing wear patterns that indicate connecting rod alignment and main bearing bore problems; determine needed action.	P-2
				11. Inspect and measure piston skirts and ring lands; determine needed action.	P-2
				12. Determine piston-to-bore clearance.	P-2
				13. Inspect, measure, and install piston rings.	P-2

				14. Inspect auxiliary shaft(s) (balance, intermediate, idler, counterbalance and/or silencer); inspect shaft(s) and support bearings for damage and wear; determine needed action; reinstall and time.	P-2
				15. Assemble engine block.	P-1
I. ENGINE REPAIR		**I. ENGINE REPAIR**		**I. ENGINE REPAIR**	
D. Lubrication and Cooling Systems		**D. Lubrication and Cooling Systems**		**D. Lubrication and Cooling Systems**	
1. Identify lubrication and cooling system components and configurations.	P-1	1. Identify lubrication and cooling system components and configurations.	P-1	1. Identify lubrication and cooling system components and configurations.	P-1
2. Perform engine oil and filter change; use proper fluid type per manufacturer specification; reset maintenance reminder as required.	P-1	2. Perform engine oil and filter change; use proper fluid type per manufacturer specification; reset maintenance reminder as required.	P-1	2. Perform engine oil and filter change; use proper fluid type per manufacturer specification; reset maintenance reminder as required.	P-1
3. Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant reservoir/recovery tank, heater core, and galley plugs.	P-1	3. Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant reservoir/recovery tank, heater core, and galley plugs; determine needed action.	P-1	3. Perform cooling system pressure and dye tests to identify leaks; check coolant condition and level; inspect and test radiator, pressure cap, coolant reservoir/recovery tank, heater core, and galley plugs; determine needed action.	P-1
4. Identify causes of engine overheating.	P-2	4. Identify causes of engine overheating.	P-1	4. Identify causes of engine overheating.	P-1
5. Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.	P-1	5. Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.	P-1	5. Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment.	P-1
6. Inspect and test coolant; drain and recover coolant; flush and/or refill cooling system; use	P-1	6. Inspect and test coolant; drain and recover coolant; flush and/or refill cooling	P-1	6. Inspect and test coolant; drain and recover coolant; flush and/or refill	P-1

proper fluid type per manufacturer specification; bleed air as required.		system; use proper fluid type per manufacturer specification; bleed air as required.		cooling system; use proper fluid type per manufacturer specification; bleed air as required.	
7. Identify different types of water/coolant pumps (belt driven, chain driven, and electric).	P-2	7. Identify different types of water/coolant pumps (belt driven, chain driven, and electric).	P-1	7. Identify different types of water/coolant pumps (belt driven, chain driven, and electric).	P-1
8. Remove, inspect, and replace thermostat and gasket/seal.	P-1	8. Remove, inspect, and replace thermostat and gasket/seal.	P-1	8. Remove, inspect, and replace thermostat and gasket/seal.	P-1
		9. Inspect, remove, and replace water/coolant pumps.	P-2	9. Inspect, remove, and replace water/coolant pumps.	P-2
		10. Remove and replace radiator.	P-2	10. Remove and replace radiator.	P-2
		11. Inspect and test fan(s), fan clutch (electrical and/or mechanical), fan shroud, and air dams/shutters; determine needed action.	P-1	11. Inspect and test fan(s), fan clutch (electrical and/or mechanical), fan shroud, and air dams/shutters; determine needed action.	P-1
		12. Perform oil pressure tests; determine needed action.	P-1	12. Perform oil pressure tests; determine needed action.	P-1
		13. Inspect auxiliary coolers; determine needed action.	P-2	13. Inspect auxiliary coolers; determine needed action.	P-2
		14. Inspect, test, and replace oil temperature and pressure switches and sensors.	P-2	14. Inspect, test, and replace oil temperature and pressure switches and sensors.	P-1
				15. Inspect oil pump gears or rotors, housing, pressure relief devices, pressure control devices, and pump drive; determine needed action	P-2

ER Tasks - MLR		ER Tasks - AST		ER Tasks - MAST	
P-1	12	P-1	21	P-1	25
P-2	6	P-2	9	P-2	20
P-3	0	P-3	0	P-3	8

Specialty Equipment

This section covers the tools and equipment a lab/shop should have for training in any given specialty area. This equipment is specialized, and it must be available in the lab/shop or to the program. No specific type or brand names are identified because they will vary in each local situation. An "X" indicates that tool is appropriate for performing tasks at that accreditation level.

For all tasks which are taught in the program, the training should be as thorough as possible with the tools and equipment necessary for those tasks. **In other words, if a program does not teach a particular task, tools associated with that task are not required.**

ASE AUTOMOBILE ACCREDITATION TOOL LIST – SPECIALTY EQUIPMENT – 2024			
Note: if a program does not teach a particular task, tools associated with that task are not required.			
ENGINE REPAIR	**MLR**	**AST**	**MAST**
Antifreeze/Coolant Tester - Refractometer	X	X	X
Ball (Small Hole) Gauges			X
Cam Bearing Driver Set			X
Camshaft Holding Tool			X
Cylinder Deglazer			X
Dial Bore Indicator			X
Engine Stands and Cylinder Head Stands		X	X
Inside Micrometer Set – 0-6", 0-125mm			X
Oil Pressure Gauge		X	X
Portable Crane - 1/2 Ton			X
Precision Straight Edge	X	X	X
Ring Compressor			X
Ring Expander			X
Ring Groove Cleaner			X
Telescopic Gauge Set			X
Torque Angle Gauge	X	X	X
V-Blocks			X
Valve Spring Compressor			X
Valve Spring Tester			X

ASE AUTOMOBILE ACCREDITATION TASK LIST – AUTOMATIC TRANSMISSION AND TRANSAXLE – 2024					
For every task in Automatic Transmission and Transaxle, the following safety requirement must be strictly enforced:					
Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.					
Maintenance & Light Repair (MLR)		**Automobile Service Technology (AST)**		**Master Automobile Service Technology (MAST)**	
540 Hours		**840 Hours**		**1200 Hours**	
II. AUTOMATIC TRANSMISSION AND TRANSAXLE		**II. AUTOMATIC TRANSMISSION AND TRANSAXLE**		**II. AUTOMATIC TRANSMISSION AND TRANSAXLE**	
A. General		**A. General**		**A. General**	
1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1
2. Identify automatic transmission and transaxle components and configurations, including torque converter automatic, dual-clutch automatic (DCT), CVT, and xEV drive.	P-1	2. Identify automatic transmission and transaxle components and configurations, including torque converter automatic, dual-clutch automatic (DCT), CVT, and xEV drive..	P-1	2. Identify automatic transmission and transaxle components and configurations, including torque converter automatic, dual-clutch automatic (DCT), CVT, and xEV drive.	P-1
3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1
4. Inspect transmission fluid condition; check fluid level; inspect for leaks on transmission or transaxle equipped with a dipstick.	P-1	4. Inspect transmission fluid condition; check fluid level; inspect for leaks on transmission or transaxle equipped with a dipstick.	P-1	4. Inspect transmission fluid condition; check fluid level; inspect for leaks on transmission or transaxle equipped with a dipstick.	P-1

5. Demonstrate knowledge of procedures to check transmission fluid condition and level on transmission or transaxle not equipped with a dipstick.	P-1	5. Inspect transmission fluid condition; check fluid level; inspect for leaks on transmission or transaxle not equipped with a dipstick.	P-1	5. Inspect transmission fluid condition; check fluid level; inspect for leaks on transmission or transaxle not equipped with a dipstick.	P-1
6. Demonstrate knowledge of transmission/transaxle gear reduction/multiplication operation using driving, driven, and held member (power flow) principles.	P-3	6. Diagnose transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles.	P-1	6. Diagnose transmission/transaxle gear reduction/multiplication concerns using driving, driven, and held member (power flow) principles.	P-1
7. Demonstrate knowledge of hydraulic principles (Pascal's Law) in a transmission/transaxle.	P-3	7. Diagnose pressure concerns in a transmission using hydraulic principles (Pascal's Law).	P-2	7. Diagnose pressure concerns in a transmission using hydraulic principles (Pascal's Law).	P-1
		8. Identify and interpret transmission/transaxle concerns, differentiate between engine performance and transmission/transaxle concerns; determine needed action.	P-1	8. Identify and interpret transmission/transaxle concerns, differentiate between engine performance and transmission/transaxle concerns; determine needed action.	P-1
		9. Diagnose fluid loss and condition concerns; determine needed action.	P-1	9. Diagnose fluid loss and condition concerns; determine needed action.	P-1
		10. Perform stall test; determine needed action.	P-3	10. Perform stall test; determine needed action.	P-3
		11. Perform lock-up converter system tests; determine needed action.	P-3	11. Perform lock-up converter system tests; determine needed action.	P-2
		12. Perform pressure tests on transmissions/transaxles equipped with electronic pressure control; determine needed action.	P-2	12. Perform pressure tests on transmissions/transaxles equipped with electronic pressure control; determine needed action.	P-1
		13. Diagnose electronic transmission/transaxle control systems	P-1	13. Diagnose electronic transmission/transaxle control systems	P-1

		using appropriate test equipment and service information.		using appropriate test equipment and service information.	
				14. Diagnose noise and vibration concerns; determine needed action.	P-2
II. AUTOMATIC TRANSMISSION AND TRANSAXLE		**II. AUTOMATIC TRANSMISSION AND TRANSAXLE**		**II. AUTOMATIC TRANSMISSION AND TRANSAXLE**	
B. In-Vehicle Transmission/Transaxle		**B. In-Vehicle Transmission/Transaxle**		**B. In-Vehicle Transmission/Transaxle**	
1. Inspect external manual valve shift linkage, transmission range sensor/switch, and/or park/neutral position switch.	P-2	1. Inspect, adjust, and/or replace external manual valve shift linkage, transmission range sensor/switch, and/or park/neutral position switch.	P-2	1. Inspect, adjust, and/or replace external manual valve shift linkage, transmission range sensor/switch, and/or park/neutral position switch.	P-1
2. Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification.	P-1	2. Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification.	P-1	2. Drain and replace fluid and filter(s); use proper fluid type per manufacturer specification.	P-1
3. Demonstrate knowledge of relearn procedures.	P-2	3. Perform relearn procedures.	P-2	3. Perform relearn procedures.	P-2
4. Inspect, replace and/or align power train mounts.	P-3	4. Inspect, replace and/or align power train mounts.	P-1	4. Inspect, replace/or and align powertrain mounts.	P-1
		5. Inspect for leakage; replace external seals, gaskets, and bushings.	P-2	5. Inspect for leakage; replace external seals, gaskets, and bushings.	P-2
		6. Inspect, test, adjust, repair, and/or replace electrical/electronic components and circuits.	P-1	6. Inspect, test, adjust, repair, and/or replace electrical/electronic components and circuits.	P-1
II. AUTOMATIC TRANSMISSION AND TRANSAXLE		**II. AUTOMATIC TRANSMISSION AND TRANSAXLE**		**II. AUTOMATIC TRANSMISSION AND TRANSAXLE**	

C. Off-Vehicle Transmission and Transaxle		C. Off-Vehicle Transmission and Transaxle		C. Off-Vehicle Transmission and Transaxle	
1. Describe the operational characteristics of a continuously variable transmission (CVT).	P-3	1. Describe the operational characteristics of a continuously variable transmission (CVT).	P-2	1. Describe the operational characteristics of a continuously variable transmission (CVT).	P-2
2. Describe the operational characteristics of a hybrid vehicle drive train.	P-3	2. Describe the operational characteristics of a hybrid vehicle drive train.	P-2	2. Describe the operational characteristics of a hybrid vehicle drive train.	P-2
3. Describe the operational characteristics of a dual-clutch transmission (DCT).	P-3	3. Describe the operational characteristics of a dual-clutch transmission (DCT).	P-2	3. Describe the operational characteristics of a dual-clutch transmission (DCT).	P-2
		4. Remove and reinstall transmission/transaxle and torque converter; inspect engine core plugs, rear crankshaft seal, dowel pins, dowel pin holes, and mating surfaces.	P-2	4. Remove and reinstall transmission/transaxle and torque converter; inspect engine core plugs, rear crankshaft seal, dowel pins, dowel pin holes, and mating surfaces.	P-2
		5. Inspect, leak test, flush, and/or replace transmission/transaxle oil cooler, lines, and fittings.	P-1	5. Inspect, leak test, flush, and/or replace transmission/transaxle oil cooler, lines, and fittings.	P-1
		6. Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore.	P-2	6. Inspect converter flex (drive) plate, converter attaching bolts, converter pilot, converter pump drive surfaces, converter end play, and crankshaft pilot bore.	P-2
				7. Disassemble, clean, and inspect transmission/transaxle.	P-2

				8. Inspect, measure, clean, and replace valve body (includes surfaces, bores, springs, valves, switches, solenoids, sleeves, retainers, brackets, check valves/balls, screens, spacers, and gaskets).	P-2
				9. Inspect servo and accumulator bores, pistons, seals, pins, springs, and retainers; determine needed action.	P-2
				10. Assemble transmission/transaxle.	P-2
				11. Inspect, measure, and reseal oil pump assembly and components.	P-2
				12. Measure transmission/transaxle end play and/or preload; determine needed action.	P-2
				13. Inspect, measure, and/or replace thrust washers and bearings.	P-2
				14. Inspect oil delivery circuits, including seal rings, ring grooves, and sealing surface areas, feed pipes, orifices, and check valves/balls.	P-2
				15. Inspect bushings; determine needed action.	P-2
				16. Inspect and measure planetary gear assembly components; determine needed action.	P-2

				17. Inspect case bores, passages, bushings, vents, and mating surfaces; determine needed action.	P-2
				18. Diagnose and inspect transaxle drive, link chains, sprockets, gears, bearings, and bushings; determine needed action.	P-2
				19. Inspect measure, repair, adjust or replace transaxle final drive components.	P-2
				20. Inspect clutch drum, piston, check-balls, springs, retainers, seals, friction plates, pressure plates, and bands; determine needed action.	P-2
				21. Measure clutch pack clearance; determine needed action.	P-2
				22. Air test operation of clutch and servo assemblies.	P-2
				23. Inspect one-way clutches, races, rollers, sprags, springs, cages, retainers; determine needed action.	P-2
AT Tasks - MLR		**AT Tasks - AST**		**AT Tasks - MAST**	
P-1	6	P-1	13	P-1	16
P-2	2	P-2	10	P-2	26
P-3	6	P-3	2	P-3	1

ASE AUTOMOBILE ACCREDITATION TOOL LIST – SPECIALTY EQUIPMENT – 2024			
Note: if a program does not teach a particular task, tools associated with that task are not required.			
AUTOMATIC TRANSMISSION/TRANSAXLE	**MLR**	**AST**	**MAST**
Differential Set-up Tools			X
Hydraulic Pressure Gauge Set		X	X
Transmission Jack(s)		X	X
Transmission/Transaxle Flushing Equipment		X	X
Transmission/Transaxle Removal and Installation Equipment		X	X
Transmission/Transaxle Holding Fixtures		X	X
Transmission/Transaxle Special Tool Sets (appropriate for units being utilized)		X	X

ASE AUTOMOBILE ACCREDITATION TASK LIST – MANUAL DRIVE TRAIN AND AXLES – 2024					
For every task in Manual Drive Train and Axles, the following safety requirement must be strictly enforced:					
Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.					
Maintenance & Light Repair (MLR)		**Automobile Service Technology (AST)**		**Master Automobile Service Technology (MAST)**	
540 Hours		**840 Hours**		**1200 Hours**	
III. MANUAL DRIVE TRAIN AND AXLES		**III. MANUAL DRIVE TRAIN AND AXLES**		**III. MANUAL DRIVE TRAIN AND AXLES**	
A. General		**A. General**		**A. General**	
1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1
2. Identify manual drive train and axle components and configurations.	P-1	2. Identify manual drive train and axles components and configurations.	P-1	2. Identify manual drive train and axles components and configurations.	P-1
3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-2	3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1
4. Check fluid condition; check for leaks.	P-3	4. Check fluid condition; check for leaks; determine needed action.	P-2	4. Check fluid condition; check for leaks; determine needed action.	P-2
5. Drain and refill manual transmission/transaxle; use proper fluid type per manufacturer specification.	P-2	5. Drain and refill manual transmission/transaxle; use proper fluid type per manufacturer specification.	P-2	5. Drain and refill manual transmission/transaxle; use proper fluid type per manufacturer specification.	P-2
		6. Diagnose drive train concerns; determine needed action.	P-2	6. Diagnose drive train concerns; determine needed action.	P-2

III. MANUAL DRIVE TRAIN AND AXLES		**III. MANUAL DRIVE TRAIN AND AXLES**		**III. MANUAL DRIVE TRAIN AND AXLES**	
B. Clutch		**B. Clutch**		**B. Clutch**	
1. Demonstrate knowledge of procedures to check and adjust clutch primary cylinder fluid level.	P-3	1. Check and adjust clutch primary cylinder fluid level; check for leaks; use proper fluid type per manufacturer specification.	P-2	1. Check and adjust clutch primary cylinder fluid level; check for leaks; use proper fluid type per manufacturer specification.	P-2
		2. Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine needed action.	P-3	2. Diagnose clutch noise, binding, slippage, pulsation, and chatter; determine needed action.	P-3
		3. Inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; determine needed action.	P-3	3. Inspect clutch pedal linkage, cables, automatic adjuster mechanisms, brackets, bushings, pivots, and springs; determine needed action.	P-3
		4. Inspect clutch pressure plate assembly, clutch disc, release (throw-out) bearing, linkage, and pilot bearing/bushing (as applicable).	P-2	4. Inspect clutch pressure plate assembly, clutch disc, release (throw-out) bearing, linkage, and pilot bearing/bushing (as applicable).	P-2
		5. Bleed clutch hydraulic system.	P-2	5. Bleed clutch hydraulic system.	P-2
		6. Inspect flywheel and ring gear for wear and cracks, and discoloration; determine needed action.	P-2	6. Inspect flywheel and ring gear for wear, cracks, and discoloration; determine needed action.	P-2
		7. Measure flywheel runout and crankshaft end play; determine needed action.	P-2	7. Measure flywheel runout and crankshaft end play; determine needed action.	P-2
		8. Describe the operation and service of a system that uses a dual mass flywheel.	P-3	8. Describe the operation and service of a system that uses a dual mass flywheel.	P-3

III. MANUAL DRIVE TRAIN AND AXLES		III. MANUAL DRIVE TRAIN AND AXLES		III. MANUAL DRIVE TRAIN AND AXLES	
C. Transmission/Transaxle		**C. Transmission/Transaxle**		**C. Transmission/Transaxle**	
		1. Inspect, adjust, lubricate, and/or replace shift linkages, brackets, bushings, cables, pivots, and levers.	P-2	1. Inspect, adjust, lubricate, and/or replace shift linkages, brackets, bushings, cables, pivots, and levers.	P-2
				2. Diagnose noise concerns through the application of transmission/transaxle powerflow principles; determine needed action.	P-2
				3. Diagnose hard shifting and jumping out of gear concerns; determine needed action.	P-2
				4. Diagnose transaxle final drive assembly noise and vibration concerns; determine needed action.	P-2
				5. Disassemble, inspect, clean, and reassemble internal transmission/transaxle components.	P-3
III. MANUAL DRIVE TRAIN AND AXLES		**III. MANUAL DRIVE TRAIN AND AXLES**		**III. MANUAL DRIVE TRAIN AND AXLES**	
D. Drive Shaft, Half Shafts, Universal Joints and Constant-Velocity (CV) Joints (Front, Rear, All, and Four-wheel Drive)		**D. Drive Shaft and Half Shaft, Universal and Constant-Velocity (CV) Joints (Front, Rear, All, and Four-wheel Drive)**		**D. Drive Shaft and Half Shaft, Universal and Constant-Velocity (CV) Joints (Front, Rear, All, and Four-wheel Drive)**	
1. Inspect and/or remove/replace bearings, hubs, and seals.	P-2	1. Inspect and/or remove/replace bearings, hubs, and seals.	P-1	1. Inspect and/or remove/replace bearings, hubs, and seals.	P-1
2. Inspect and/or service/replace shafts, yokes, boots, and universal/CV joints.	P-2	2. Inspect and/or service/replace shafts, yokes, boots, and universal/CV joints.	P-1	2. Inspect and/or service/replace shafts, yokes, boots, and universal/CV joints.	P-1

		3. Diagnose constant-velocity (CV) joint noise and vibration concerns; determine needed action.	P-1	3. Diagnose constant-velocity (CV) joint noise and vibration concerns; determine needed action.	P-1
		4. Diagnose universal joint noise and vibration concerns; determine needed action.	P-1	4. Diagnose universal joint noise and vibration concerns; determine needed action.	P-1
		5. Check shaft balance and phasing; measure shaft runout; measure and adjust driveline angles; determine needed action.	P-2	5. Check shaft balance and phasing; measure shaft runout; measure and adjust driveline angles; determine needed action.	P-2
III. MANUAL DRIVE TRAIN AND AXLES		**III. MANUAL DRIVE TRAIN AND AXLES**		**III. MANUAL DRIVE TRAIN AND AXLES**	
E. Differential and Drive Axles		**E. Differential and Drive Axles**		**E. Differential and Drive Axles**	
E.1 Ring and Pinion Gears and Differential Housing Assembly		**E.1 Ring and Pinion Gears and Differential Housing Assembly**		**E.1 Ring and Pinion Gears and Differential Case Assembly**	
1. Inspect differential housing; check for leaks; inspect housing vent.	P-1	1. Inspect differential housing; check for leaks; inspect housing vent.	P-1	1. Inspect differential housing; check for leaks; inspect housing vent.	P-1
2. Check and adjust differential housing fluid level; use proper fluid type per manufacturer specification.	P-1	2. Check and adjust differential housing fluid level; use proper fluid type per manufacturer specification.	P-1	2. Check and adjust differential housing fluid level; use proper fluid type per manufacturer specification.	P-1
3. Drain and refill differential housing; using proper fluid type per manufacturer specification.	P-1	3. Drain and refill differential housing; using proper fluid type per manufacturer specification.	P-1	3. Drain and refill differential housing; use proper fluid type per manufacturer specification.	P-1
		4. Inspect and replace companion flange and/or pinion seal; measure companion flange runout.	P-2	4. Inspect and replace companion flange and/or pinion seal; measure companion flange runout.	P-2
		5. Demonstrate knowledge of drive pinion and ring gear service and set up	P-2	5. Inspect ring gear and measure runout; determine needed action.	P-2

		including depth, preload, backlash, and gear tooth contact.			
				6. Diagnose noise and vibration concerns; determine needed action.	P-2
				7. Remove, inspect, reinstall, or replace drive pinion and ring gear, spacers, sleeves, and bearings.	P-2
				8. Measure and adjust drive pinion depth.	P-2
				9. Measure and adjust drive pinion bearing preload.	P-2
				10. Measure and adjust side bearing preload and ring and pinion gear total backlash and backlash variation on a differential carrier assembly (threaded cup or shim types).	P-2
				11. Check ring and pinion tooth contact patterns; determine needed action.	P-2
				12. Disassemble, inspect, measure, adjust, and/or replace differential pinion gears (spiders), shaft, side gears, side bearings, thrust washers, and case.	P-2
				13. Reassemble and reinstall differential case assembly; measure runout; determine needed action.	P-2
E.2 Drive Axles		**E.2 Drive Axles**		**E.2 Drive Axles**	

1. Inspect and replace drive axle wheel studs.	P-2	1. Inspect and replace drive axle wheel studs.	P-2	1. Inspect and replace drive axle wheel studs.	P-2
		2. Remove and replace drive axle shafts.	P-1	2. Remove and replace drive axle shafts.	P-1
		3. Inspect and replace drive axle shaft seals, bearings, and retainers.	P-2	3. Inspect and replace drive axle shaft seals, bearings, and retainers.	P-2
		4. Measure drive axle flange runout and shaft end play; determine needed action.	P-2	4. Measure drive axle flange runout and shaft end play; determine needed action.	P-2
				5. Diagnose drive axle shafts, bearings, and seals for noise, vibration, and fluid leakage concerns; determine needed action.	P-2
				E.3 Limited Slip Differential	
				1. Diagnose noise, slippage, and chatter concerns including electronically controlled systems; determine needed action.	P-3
				2. Measure rotating torque; determine needed action.	P-3
III. MANUAL DRIVE TRAIN AND AXLES		**III. MANUAL DRIVE TRAIN AND AXLES**		**III. MANUAL DRIVE TRAIN AND AXLES**	
F. Four-wheel Drive/All-wheel Drive		**F. Four-wheel Drive/All-wheel Drive**		**F. Four-wheel Drive/All-wheel Drive**	
1. Identify concerns related to variations in tire circumference and/or final drive ratios.	P-3	1. Identify concerns related to variations in tire circumference and/or final drive ratios.	P-2	1. Identify concerns related to variations in tire circumference and/or final drive ratios.	P-1
2. Check for leaks at drive assembly and transfer case seals; check vents; check fluid	P-2	2. Check for leaks at drive assembly and transfer case seals; check vents; check	P-2	2. Check for leaks at drive assembly and transfer case seals; check vents; check	P-2

level; use proper fluid type per manufacturer specification.		fluid level; use proper fluid type per manufacturer specification.		fluid level; use proper fluid type per manufacturer specification.	
		3. Inspect, adjust, and repair shifting controls (mechanical, electrical, and vacuum), bushings, mounts, levers, and brackets.	P-2	3. Inspect, adjust, and repair shifting controls (mechanical, electrical, and vacuum), bushings, mounts, levers, and brackets.	P-2
		4. Inspect axle locking mechanisms; determine needed action(s).	P-3	4. Inspect axle locking mechanisms; determine needed action(s).	P-3
				5. Diagnose noise, vibration, and unusual steering concerns; determine needed action.	P-2
				6. Diagnose, test, adjust, and/or replace electrical/electronic components of four-wheel drive/all-wheel drive systems.	P-2
				7. Disassemble, service, and reassemble transfer case and components.	P-3
MD Tasks - MLR		**MD Tasks - AST**		**MD Tasks - MAST**	
P-1	5	P-1	11	P-1	12
P-2	6	P-2	18	P-2	31
P-3	3	P-3	4	P-3	8

ASE AUTOMOBILE ACCREDITATION TOOL LIST – SPECIALTY EQUIPMENT – 2024			
Note: if a program does not teach a particular task, tools associated with that task are not required.			
MANUAL DRIVE TRAIN AND AXLES	**MLR**	**AST**	**MAST**
Axle Nut Socket Set (or equivalent)	X	X	X
Clutch Alignment Set		X	X
Clutch Pilot Bearing/Bushing Puller/Installer		X	X
Constant Velocity Joint (CV) Boot Clamp Pliers or Crimping Ring		X	X
Engine Support Fixture		X	X
Rotating Torque Wrench		X	X
Special Tools for Transmissions, Transaxles, Transfer Cases, and Differentials (appropriate for units being taught)			X
Universal Joint Tools	X	X	X
Wheel Stud Installation Tools	X	X	X

ASE AUTOMOBILE ACCREDITATION TASK LIST – SUSPENSION AND STEERING – 2024					
For every task in Suspension and Steering, the following safety requirement must be strictly enforced:					
Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.					
Maintenance & Light Repair (MLR)		**Automobile Service Technology (AST)**		**Master Automobile Service Technology (MAST)**	
540 Hours		**840 Hours**		**1200 Hours**	
IV. SUSPENSION AND STEERING		**IV. SUSPENSION AND STEERING**		**IV. SUSPENSION AND STEERING**	
A. General		**A. General**		**A. General**	
1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1
2. Identify suspension and steering system components and configurations.	P-1	2. Identify suspension and steering system components and configurations.	P-1	2. Identify suspension and steering system components and configurations.	P-1
3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	3 Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1
4. Disable, enable, and properly handle SRS/airbag system components during vehicle service following manufacturers' procedures.	P-2	4. Disable, enable, and properly handle SRS/airbag system components during vehicle service following manufacturers' procedures.	P-1	4. Disable, enable, and properly handle SRS/airbag system components during vehicle service following manufacturers' procedures.	P-1
		5. Identify and interpret suspension and steering system concerns; determine needed action.	P-1	5. Identify and interpret suspension and steering system concerns; determine needed action.	P-1
IV. SUSPENSION AND STEERING		**IV. SUSPENSION AND STEERING**		**IV. SUSPENSION AND STEERING**	

B. Steering Systems		B. Steering Systems		B. Steering Systems	
1. Inspect rack and pinion steering gear, tie rod ends (sockets), and bellows boots.	P-1	1. Inspect rack and pinion steering gear, tie rod ends (sockets), and bellows boots; repair or replace as needed.	P-1	1. Inspect rack and pinion steering gear, tie rod ends (sockets), and bellows boots; repair or replace as needed.	P-1
2. Inspect power steering fluid level and condition.	P-2	2. Inspect power steering fluid level and condition.	P-2	2. Inspect power steering fluid level and condition.	P-2
3. Drain and replace power steering system fluid; use proper fluid type per manufacturer specification.	P-2	3. Drain and replace power steering system fluid; use proper fluid type per manufacturer specification.	P-2	3. Drain and replace power steering system fluid; use proper fluid type per manufacturer specification.	P-2
4. Inspect for power steering fluid leakage.	P-2	4. Inspect for power steering fluid leakage; determine needed action.	P-2	4. Inspect for power steering fluid leakage; determine needed action.	P-2
5. Remove, inspect, replace, and/or adjust power steering pump drive belt.	P-2	5. Remove, inspect, replace, and/or adjust power steering pump drive belt.	P-2	5. Remove, inspect, replace, and/or adjust power steering pump drive belt.	P-2
6. Inspect, remove, and/or replace power steering hoses and fittings.	P-2	6. Inspect, remove, and/or replace power steering hoses and fittings.	P-2	6. Inspect, remove, and/or replace power steering hoses and fittings.	P-2
7. Inspect pitman arm, relay (centerlink/intermediate) rod, idler arm, mountings, and steering linkage damper.	P-3	7. Inspect, remove, and/or replace pitman arm, relay (centerlink/intermediate) rod, idler arm, mountings, and steering linkage damper.	P-3	7. Inspect, remove, and/or replace pitman arm, relay (centerlink/intermediate) rod, idler arm, mountings, and steering linkage damper.	P-3
8. Inspect tie rod ends (sockets), tie rod sleeves, and clamps (non-rack and pinion).	P-3	8. Inspect, replace, and/or adjust tie rod ends (sockets), tie rod sleeves, and clamps (non-rack and pinion).	P-3	8. Inspect, replace, and/or adjust tie rod ends (sockets), tie rod sleeves, and clamps (non-rack and pinion).	P-3
9. Demonstrate knowledge of electric power steering system operation	P-2	9. Inspect and test electric power steering system; determine needed action.	P-2	9. Inspect and test electric power steering system; determine needed action.	P-1

		10. Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring).	P-1	10. Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring).	P-1
		11. Diagnose steering column noises, looseness, and binding concerns (including tilt/telescoping mechanisms); determine needed action.	P-2	11. Diagnose steering column noises, looseness, and binding concerns (including tilt/telescoping mechanisms); determine needed action.	P-2
		12. Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action.	P-3	12. Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action.	P-3
		13. Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action.	P-2	13. Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action.	P-1
		14. Inspect steering shaft universal joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; determine needed action.	P-2	14. Inspect steering shaft universal joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; determine needed action.	P-2
		15. Remove and replace rack and pinion steering gear; inspect mounting bushings and brackets.	P-2	15. Remove and replace rack and pinion steering gear; inspect mounting bushings and brackets.	P-2
		16. Remove and reinstall power steering pump.	P-2	16. Remove and reinstall power steering pump.	P-2
		17. Remove and reinstall press fit power steering pump pulley; check pulley and belt alignment.	P-2	17. Remove and reinstall press fit power steering pump pulley; check pulley and belt alignment.	P-2
				18. Test power steering system pressure; determine needed action.	P-3

I. SUSPENSION AND STEERING		**IV. SUSPENSION AND STEERING**		**IV. SUSPENSION AND STEERING**	
C. Suspension Systems		**C. Suspension Systems**		**C. Suspension Systems**	
1. Inspect upper and/or lower control arms, bushings, and shafts.	P-2	1. Inspect, remove, and/or replace upper and/or lower control arms, bushings, and shafts.	P-2	1. Inspect, remove, and/or replace upper and/or lower control arms, bushings, and shafts.	P-2
2. Inspect and replace rebound/jounce bumpers.	P-3	2. Inspect and replace rebound/jounce bumpers.	P-2	2. Inspect and replace rebound/jounce bumpers.	P-2
3. Inspect track bar, strut rods/radius arms, and related mounts and bushings.	P-2	3. Inspect, remove, and/or replace track bar, strut rods/radius arms, and related mounts and bushings.	P-2	3. Inspect, remove, and/or replace track bar, strut rods/radius arms, and related mounts and bushings.	P-2
4. Inspect upper and/or lower ball joints (with or without wear indicators).	P-2	4. Inspect, remove, and/or replace upper and/or lower ball joints (with or without wear indicators).	P-3	4. Inspect, remove, and/or replace upper and/or lower ball joints (with or without wear indicators).	P-2
5. Inspect suspension system coil springs and spring insulators.	P-2	5. Inspect, remove, and/or replace suspension system coil springs and spring insulators.	P-2	5. Inspect, remove, and/or replace suspension system coil springs and spring insulators.	P-2
6. Inspect torsion bars and mounts.	P-3	6. Inspect, remove, and/or replace torsion bars and mounts.	P-3	6. Inspect, remove, and/or replace torsion bars and mounts	P-3
7. Inspect, remove, and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links.	P-2	7. Inspect, remove, and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links.	P-2	7. Inspect, remove, and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links.	P-2
8. Inspect, remove, and/or replace strut assembly, strut coil spring, insulators, and upper strut bearing mount.	P-2	8. Inspect, remove, and/or replace strut assembly, strut coil spring, insulators, and upper strut bearing mount.	P-2	8. Inspect, remove, and/or replace strut assembly, strut coil spring, insulators, and upper strut bearing mount.	P-2

9. Inspect components of suspension systems (Coil, Leaf, and Torsion).	P-1	9. Inspect, remove, and/or replace components of suspension systems (Coil, Leaf, and Torsion).	P-1	9. Inspect, remove, and/or replace components of suspension systems (Coil, Leaf, and Torsion).	P-1
10. Inspect components of electronically controlled suspension systems.	P-2	10. Inspect, remove, and/or replace components of electronically controlled suspension systems.	P-2	10. Inspect, remove, and/or replace components of electronically controlled suspension systems.	P-1
		11. Inspect, remove, and/or replace steering knuckle assemblies.	P-2	11. Inspect, remove, and/or replace steering knuckle assemblies.	P-2
		12. Diagnose suspension system noises, body sway, and uneven ride height concerns; determine needed action.	P-1	12. Diagnose suspension system noises, body sway, and uneven ride height concerns; determine needed action	P-1
IV. SUSPENSION AND STEERING		**IV. SUSPENSION AND STEERING**		**IV. SUSPENSION AND STEERING**	
D. Related Suspension and Steering Service		**D. Related Suspension and Steering Service**		**D. Related Suspension and Steering Service**	
1. Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings.	P-1	1. Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings.	P-1	1. Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings	P-1
2. Inspect front and rear wheel bearings.	P-1	2. Inspect, service, and/or replace front and rear wheel bearings.	P-1	2. Inspect, service, and/or replace front and rear wheel bearings.	P-1
3. Describe the function of electronically controlled suspension and steering systems and components, (i.e., active suspension and stability control).	P-2	3. Describe the function of electronically controlled suspension and steering systems and components, (i.e., active suspension and stability control).	P-2	3. Describe the function of electronically controlled suspension and steering systems and components, (i.e., active suspension and stability control).	P-2
IV. SUSPENSION AND STEERING		**IV. SUSPENSION AND STEERING**		**IV. SUSPENSION AND STEERING**	
E. Wheel Alignment		**E. Wheel Alignment**		**E. Wheel Alignment**	
1. Determine the need to calibrate a vehicle's advanced driver assistance	P-1	1. Determine the need to calibrate a vehicle's advanced driver assistance system (ADAS) after repairs or adjustments.	P-1	1. Determine the need to calibrate a vehicle's advanced driver assistance	P-1

system (ADAS) after repairs or adjustments.				system (ADAS) after repairs or adjustments.	
2. Perform pre-alignment inspection, place vehicle in service mode as required; measure vehicle ride height.	P-1	2. Perform pre-alignment inspection, place vehicle in service mode as required; measure vehicle ride height; determine needed action.	P-1	2. Perform pre-alignment inspection, place vehicle in service mode as required; measure vehicle ride height; determine needed action.	P-1
3. Describe four-wheel alignment angles (camber, caster, toe, set-back, and thrust angle) and effects on vehicle handling\tire wear.	P-1	3. Describe four-wheel alignment angles (camber, caster, toe, set-back, and thrust angle) and effects on vehicle handling\tire wear.	P-1	3. Describe four-wheel alignment angles (camber, caster, toe, set-back, and thrust angle) and effects on vehicle handling\tire wear.	P-1
		4. Prepare vehicle for wheel alignment on alignment machine; perform four-wheel alignment by checking and adjusting front caster, front and rear camber, and toe as required; center steering wheel.	P-1	4. Prepare vehicle for wheel alignment on alignment machine; perform four-wheel alignment by checking and adjusting front caster, front and rear camber, and toe as required; center steering wheel.	P-1
		5. Check toe-out-on-turns (turning radius); determine needed action.	P-1	5. Check toe-out-on-turns (turning radius); determine needed action.	P-1
		6. Check steering axis inclination (SAI) and included angle; determine needed action.	P-1	6. Check steering axis inclination (SAI) and included angle; determine needed action.	P-1
		7. Check rear wheel thrust angle; determine needed action.	P-1	7. Check rear wheel thrust angle; determine needed action.	P-1
		8. Check for front wheel setback; determine needed action.	P-1	8. Check for front wheel setback; determine needed action.	P-1
		9. Identify front and/or rear cradle (subframe) misalignment; determine needed action.	P-1	9. Identify front and/or rear cradle (subframe) misalignment; determine needed action.	P-1
		10. Reset steering angle sensor.	P-1	10. Reset steering angle sensor.	P-1

		11. Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine needed action.	P-1	11. Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine needed action.	P-1
IV. SUSPENSION AND STEERING		**IV. SUSPENSION AND STEERING**		**IV. SUSPENSION AND STEERING**	
F. Wheels and Tires		**F. Wheels and Tires**		**F. Wheels and Tires**	
1. Inspect tire condition/age; identify tire wear patterns; check for correct tire size, application (service-class, load, and speed ratings), and air pressure as listed on the tire information placard/label.	P-1	1. Inspect tire condition/age; identify tire wear patterns; check for correct tire size, application (service-class, load, and speed ratings), and air pressure as listed on the tire information placard/label.	P-1	1. Inspect tire condition/age; identify tire wear patterns; check for correct tire size, application (service-class, load, and speed ratings), and air pressure as listed on the tire information placard/label.	P-1
2. Rotate tires according to manufacturer's recommendations including vehicles equipped with tire pressure monitoring systems (TPMS).	P-1	2. Rotate tires according to manufacturer's recommendation including vehicles equipped with tire pressure monitoring system (TPMS).	P-1	2. Rotate tires according to manufacturer's recommendation including vehicles equipped with tire pressure monitoring systems (TPMS).	P-1
3. Dismount, inspect, and remount tire on wheel (with/without TPMS); balance wheel and tire assembly.	P-1	3. Dismount, inspect, and remount tire on wheel (with/without TPMS); balance wheel and tire assembly.	P-1	3. Dismount, inspect, and remount tire on wheel (with/without TPMS); balance wheel and tire assembly.	P-1
4. Inspect tire and wheel assembly for air loss; determine needed action.	P-1	4. Inspect tire and wheel assembly for air loss; determine needed action.	P-1	4. Inspect tire and wheel assembly for air loss; determine needed action.	P-1
5. Repair tire following tire manufacturer approved procedure.	P-1	5. Repair tire following tire manufacturer approved procedure.	P-1	5. Repair tire following tire manufacturer approved procedure.	P-1
6. Identify indirect and direct tire pressure monitoring systems (TPMS); calibrate/relearn system; verify operation of instrument panel lamps.	P-1	6. Identify indirect and direct tire pressure monitoring systems (TPMS); calibrate/relearn system; verify operation of instrument panel lamps.	P-1	6. Identify indirect and direct tire pressure monitoring system (TPMS); calibrate/relearn system; verify operation of instrument panel lamps.	P-1

7. Demonstrate knowledge of steps required to remove and replace sensors (per OEM/sensor manufacturer) in a tire pressure monitoring system (TPMS).	P-1	7. Demonstrate knowledge of steps required to remove and replace sensors (per OEM/sensor manufacturer) in a tire pressure monitoring system (TPMS).	P-1	7. Demonstrate knowledge of steps required to remove and replace sensors (per OEM/sensor manufacturer) in a tire pressure monitoring system (TPMS).	P-1
8. Perform Road Force balance/match mounting.	P-3	8. Perform Road Force balance/match mounting.	P-2	8. Perform Road Force balance/match mounting.	P-1
		9. Diagnose wheel/tire vibration, shimmy, and noise; determine needed action.	P-1	9. Diagnose wheel/tire vibration, shimmy, and noise; determine needed action.	P-1
		10. Measure wheel, tire, axle flange, and hub runout; determine needed action.	P-2	10. Measure wheel, tire, axle flange, and hub runout; determine needed action.	P-2
		11. Diagnose tire pull problems; determine needed action.	P-1	11. Diagnose tire pull problems; determine needed action.	P-1
SS Tasks - MLR		**SS Tasks - AST**		**SS Tasks - MAST**	
P-1	17	P-1	31	P-1	35
P-2	15	P-2	23	P-2	20
P-3	5	P-3	5	P-3	5

ASE AUTOMOBILE ACCREDITATION TOOL LIST – SPECIALTY EQUIPMENT – 2024			
Note: if a program does not teach a particular task, tools associated with that task are not required.			
SUSPENSION & STEERING	**MLR**	**AST**	**MAST**
Ball Joint Press and other Special Tools		X	X
Brake Pedal Depressor	X	X	X
Bushing Driver Set		X	X
Coil Spring Compressor Tool		X	X
Chassis Ear or equivalent listening device		X	X
Frame Angle Gauge or Portable Digital Protractor	X	X	X
Hand Grease Gun	X	X	X
Inner Tie Rod End Tool		X	X
Pitman Arm Puller		X	X
Power Steering Pump Pulley Special Tool Set		X	X
Power Steering Pressure Gauges			X
Strut Spring Compressor Tool (OEM-Recommended)	X	X	X
Tie Rod Puller/Separator/Remover		X	X
Tire Mounting Machine	X	X	X
Tire Patching Tools and Supplies	X	X	X
Tire Pressure Monitoring System (TPMS) Tool	X	X	X
Wheel Alignment Equipment-4 wheel (including alignment tools)		X	X
Wheel Balancer - Electronic Type (force variation or equivalent recommended)	X	X	X
Wheel Weight Tools	X	X	X

ASE AUTOMOBILE ACCREDITATION TASK LIST – BRAKES – 2024					
For every task in Brakes, the following safety requirement must be strictly enforced:					
Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.					
Maintenance & Light Repair (MLR)		**Automobile Service Technology (AST)**		**Master Automobile Service Technology (MAST)**	
540 Hours		**840 Hours**		**1200 Hours**	
V. BRAKES		**V. BRAKES**		**V. BRAKES**	
A. General		**A. General**		**A. General**	
1. Research vehicle service information such as fluid type, system design (hydraulic, electronic, etc.), vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, system design (hydraulic, electronic, etc.), vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, system design (hydraulic, electronic, etc.), vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1
2. Identify brake system components and configurations.	P-1	2. Identify brake system components and configurations.	P-1	2. Identify brake system components and configurations.	P-1
3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1
4. Research the need to perform calibration/recalibration, initialization, or relearn procedure as required.	P-1	4. Perform calibration/recalibration, initialization, or relearn procedure as required.	P-1	4. Perform calibration/recalibration, initialization, or relearn procedure as required.	P-1
5. Research the need to place a vehicle in service mode before servicing the brake system.	P-1	5. Place a vehicle in service mode as needed before servicing the brake system.	P-1	5. Place a vehicle in service mode as needed before servicing the brake system.	P-1

6. Describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS).	P-1	6. Describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS).	P-1	6. Describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS).	P-1
7. Install wheel and torque lug nuts/wheel fasteners.	P-1	7. Install wheel and torque lug nuts/wheel fasteners.	P-1	7. Install wheel and torque lug nuts/wheel fasteners.	P-1
		8. Identify and interpret brake system concerns; determine needed action.	P-1	8. Identify and interpret brake system concerns; determine needed action.	P-1
V. BRAKES		**V. BRAKES**		**V. BRAKES**	
B. Hydraulic System		**B. Hydraulic System**		**B. Hydraulic System**	
1. Demonstrate knowledge of hydraulic principles (Pascal's law).	P-1	1. Diagnose pressure concerns in the brake system using hydraulic principles (Pascal’s Law).	P-1	1. Diagnose pressure concerns in the brake system using hydraulic principles (Pascal’s Law).	P-1
2. Describe proper brake pedal height, travel, and feel.	P-1	2. Measure brake pedal height, travel, and free play (as applicable); determine needed action.	P-1	2. Measure brake pedal height, travel, and free play (as applicable); determine needed action.	P-1
3. Check primary cylinder for proper operation.	P-1	3. Check primary cylinder for internal/external leaks and proper operation; determine needed action.	P-1	3. Check primary cylinder for internal/external leaks and proper operation; determine needed action.	P-1
4. Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, and loose fittings/supports.	P-1	4. Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, and loose fittings/supports; determine needed action.	P-1	4. Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging, wear, and loose fittings/supports; determine needed action.	P-1
5. Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer specification.	P-1	5. Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer specification.	P-1	5. Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer specification.	P-1

6. Bleed and/or replace fluid in the brake system.	P-1	6. Bleed and/or replace fluid in the brake system.	P-1	6. Bleed and/or replace fluid in the brake system.	P-1
7. Test brake fluid for contamination.	P-2	7. Test brake fluid for contamination.	P-2	7. Test brake fluid for contamination.	P-2
8. Identify components of brake warning light system.	P-2	8. Identify, inspect, test, and replace components of brake warning light system.	P-2	8. Identify, inspect, test, and replace components of brake warning light system.	P-2
		9. Remove, bench bleed, and reinstall primary cylinder.	P-1	9. Remove, bench bleed, and reinstall primary cylinder.	P-1
		10. Diagnose poor stopping, pulling, or dragging concerns caused by malfunctions in the hydraulic system; determine needed action.	P-2	10. Diagnose poor stopping, pulling, or dragging concerns caused by malfunctions in the hydraulic system; determine needed action.	P-1
		11. Replace brake lines, hoses, fittings, and supports.	P-2	11. Replace brake lines, hoses, fittings, and supports.	P-2
		12. Fabricate brake lines using proper material and flaring procedures.	P-2	12. Fabricate brake lines using proper material and flaring procedures.	P-2
V. BRAKES		**V. BRAKES**		**V. BRAKES**	
C. Drum Brakes		**C. Drum Brakes**		**C. Drum Brakes**	
1. Remove, clean, and inspect brake drum; measure brake drum diameter; determine serviceability.	P-2	1. Remove, clean, and inspect brake drum; measure brake drum diameter; determine serviceability.	P-2	1. Remove, clean, and inspect brake drum; measure brake drum diameter; determine serviceability.	P-2
2. Refinish brake drum and measure final drum diameter; compare with specification.	P-3	2. Refinish brake drum and measure final drum diameter; compare with specification.	P-2	2. Refinish brake drum and measure final drum diameter; compare with specification.	P-2

3. Remove, clean, inspect, and/or replace brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.	P-3	3. Remove, clean, inspect, and/or replace brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.	P-2	3. Remove, clean, inspect, and/or replace brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble.	P-2
4. Inspect wheel cylinders for leaks and proper operation; remove and replace as needed.	P-3	4. Inspect wheel cylinders for leaks and proper operation; remove and replace as needed.	P-2	4. Inspect wheel cylinders for leaks and proper operation; remove and replace as needed.	P-2
5. Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; perform final checks and adjustments.	P-3	5. Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; perform final checks and adjustments.	P-2	5. Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings; perform final checks and adjustments.	P-2
		6. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pedal pulsation concerns; determine needed action.	P-2	6. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pedal pulsation concerns; determine needed action.	P-2
V. BRAKES		**V. BRAKES**		**V. BRAKES**	
D. Disc Brakes		**D. Disc Brakes**		**D. Disc Brakes**	
1. Remove and clean caliper assembly; inspect for leaks, damage, and wear.	P-1	1. Remove and clean caliper assembly; inspect for leaks, damage, and wear; determine needed action.	P-1	1. Remove and clean caliper assembly; inspect for leaks, damage, and wear; determine needed action.	P-1
2. Inspect caliper mounting and slides/pins for proper operation, wear, and damage.	P-1	2. Inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine needed action	P-1	2. Inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine needed action	P-1
3. Remove, inspect, and/or replace brake pads and retaining hardware.	P-1	3. Remove, inspect, and/or replace brake pads and retaining hardware; determine needed action.	P-1	3. Remove, inspect, and/or replace brake pads and retaining hardware; determine needed action.	P-1

4. Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads against rotor; inspect for leaks.	P-1	4. Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads against rotor; inspect for leaks.	P-1	4. Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads against rotor; inspect for leaks.	P-1
5. Clean and inspect rotor and mounting surface, measure rotor thickness, thickness variation, and lateral runout.	P-1	5. Clean and inspect rotor and mounting surface; measure rotor thickness, thickness variation, and lateral runout; determine needed action.	P-1	5. Clean and inspect rotor and mounting surface; measure rotor thickness, thickness variation, and lateral runout; determine needed action.	P-1
6. Remove and reinstall/replace rotor.	P-1	6. Remove and reinstall/replace rotor.	P-1	6. Remove and reinstall/replace rotor.	P-1
7. Refinish rotor on vehicle; measure final rotor thickness and compare with specification.	P-3	7. Refinish rotor on vehicle; measure final rotor thickness and compare with specification.	P-2	7. Refinish rotor on vehicle; measure final rotor thickness and compare with specification.	P-1
8. Refinish rotor off vehicle; measure final rotor thickness and compare with specification.	P-3	8. Refinish rotor off vehicle; measure final rotor thickness and compare with specification.	P-2	8. Refinish rotor off vehicle; measure final rotor thickness and compare with specification.	P-2
9. Retract and re-adjust caliper piston on an integrated parking brake system.	P-2	9. Retract and re-adjust caliper piston on an integrated parking brake system.	P-1	9. Retract and re-adjust caliper piston on an integrated parking brake system.	P-1
10. Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendation.	P-1	10. Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendation.	P-1	10. Describe importance of operating vehicle to burnish/break-in replacement brake pads according to manufacturer's recommendation.	P-1
		11. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pulsation concerns; determine needed action.	P-1	11. Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pulsation concerns; determine needed action.	P-1
V. BRAKES		**V. BRAKES**		**V. BRAKES**	
E. Power-Assist Units		**E. Power-Assist Units**		**E. Power-Assist Units**	

1. Check brake pedal travel with and without engine running to verify proper power booster operation.	P-2	1. Check brake pedal travel with and without engine running to verify proper power booster operation.	P-2	1. Check brake pedal travel with and without engine running to verify proper power booster operation.	P-2
2. Identify components of the brake power assist system (vacuum/ hydraulic/electric).	P-2	2. Identify components of the brake power assist system (vacuum/ hydraulic/electric).	P-2	2. Identify components of the brake power assist system (vacuum/ hydraulic/electric).	P-2
		3. Inspect vacuum-type power booster unit for leaks; inspect the check-valve for proper operation; check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster; determine needed action.	P-2	3. Inspect vacuum-type power booster unit for leaks; inspect the check-valve for proper operation; check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster; determine needed action.	P-2
		4. Inspect and test hydraulically assisted power brake system for leaks and proper operation; determine needed action.	P-2	4. Inspect and test hydraulically assisted power brake system for leaks and proper operation; determine needed action.	P-2
				5. Inspect electric power booster unit; determine needed action.	P-3
V. BRAKES		**V. BRAKES**		**V. BRAKES**	
F. Related Systems (i.e., Wheel Bearings, Parking Brakes, Electrical)		**F. Related Systems (i.e., Wheel Bearings, Parking Brakes, Electrical)**		**F. Related Systems (i.e., Wheel Bearings, Parking Brakes, Electrical)**	
1. Remove, clean, inspect, repack/replace, and install wheel bearings; remove and install bearing races; replace seals; install hub and adjust bearings.	P-3	1. Remove, clean, inspect, repack/replace, and install wheel bearings; remove and install bearing races; replace seals; install hub and adjust bearings.	P-3	1. Remove, clean, inspect, repack/replace, and install wheel bearings; remove and install bearing races; replace seals; install hub and adjust bearings.	P-3
2. Check parking brake system components for wear, binding, and corrosion; clean, lubricate, adjust and/or replace as needed.	P-2	2. Check parking brake system components for wear, binding, and corrosion; clean, lubricate, adjust and/or replace as needed.	P-2	2. Check parking brake system components for wear, binding, and corrosion; clean, lubricate, adjust and/or replace as needed.	P-2

3. Check parking brake operation (including electric parking brakes); check parking brake indicator light system operation.	P-2	3. Check parking brake operation (including electric parking brakes); check parking brake indicator light system operation; determine needed action.	P-2	3. Check parking brake operation (including electric parking brakes); check parking brake indicator light system operation; determine needed action.	P-2
4. Check operation of brake stop light system.	P-1	4. Check operation of brake stop light system.	P-1	4. Check operation of brake stop light system.	P-1
5. Inspect and replace wheel studs/fasteners.	P-2	5. Inspect and replace wheel studs/fasteners.	P-2	5. Inspect and replace wheel studs/fasteners.	P-2
		6. Remove, reinstall, and/or replace sealed wheel bearing assembly.	P-1	6. Remove, reinstall, and/or replace sealed wheel bearing assembly.	P-1
		7. Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine needed action.	P-2	7. Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine needed action.	P-1
V. BRAKES		**V. BRAKES**		**V. BRAKES**	
G. Electronic Brake Control Systems: Antilock Brake (ABS), Traction Control (TCS) and Electronic Stability Control (ESC) Systems		**G. Electronic Brake Control Systems: Antilock Brake (ABS), Traction Control (TCS) and Electronic Stability Control (ESC) Systems**		**G. Electronic Brake Control Systems: Antilock Brake (ABS), Traction Control (TCS), and Electronic Stability Control (ESC) Systems**	
1. Identify electronic brake control system components and describe function (ABS, TCS, ESC).	P-2	1. Identify and inspect electronic brake control system components and describe function (ABS, TCS, ESC); determine needed action.	P-1	1. Identify and inspect electronic brake control system components and describe function (ABS, TCS, ESC); determine needed action.	P-1
2. Describe the operation of a regenerative braking system.	P-3	2. Describe the operation of a regenerative braking system.	P-2	2. Describe the operation of a regenerative braking system.	P-2
		3. Bleed the electronic brake control system hydraulic circuits.	P-2	3. Bleed the electronic brake control system hydraulic circuits.	P-1

				4. Diagnose poor stopping, wheel lock-up, abnormal pedal feel, unwanted application, and noise concerns associated with the electronic brake control system; determine needed action.	P-2
				5. Diagnose electronic brake control system electronic control(s) and components using recommended test equipment; determine needed action.	P-2
				6. Depressurize high-pressure components of an electronic brake control system.	P-2
				7. Test, diagnose, and service electronic brake control system speed sensors (digital and analog), toothed ring (tone wheel), and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO) (includes output signal, resistance, shorts to voltage/ground, and frequency data).	P-2
				8. Diagnose electronic brake control system braking concerns caused by vehicle modifications (tire size, curb height, final drive ratio, etc.).	P-2
BR Tasks - MLR		**BR Tasks - AST**		**BR Tasks - MAST**	
P-1	21	P-1	27	P-1	31
P-2	10	P-2	23	P-2	24
P-3	8	P-3	1	P-3	2

ASE AUTOMOBILE ACCREDITATION TOOL LIST – SPECIALTY EQUIPMENT – 2024			
Note: if a program does not teach a particular task, tools associated with that task are not required.			
BRAKES	**MLR**	**AST**	**MAST**
Bearing Seal and Race Driver Set	X	X	X
Brake Bleeder (Pressure or Vacuum)	X	X	X
Brake Disc Micrometer	X	X	X
Brake Drum Micrometer and Calibration Equipment	X	X	X
Brake Fluid Test Strips or Tester	X	X	X
Brake Lathe (bench with disc and drum service attachments)	X	X	X
Brake Lathe (on car)	X	X	X
Brake Lining Thickness Measurement Tool	X	X	X
Brake Shoe Adjusting Gauge	X	X	X
Brake Spring Remover/Installer	X	X	X
Brake Spring Pliers	X	X	X
Brake Spoon	X	X	X
Caliper Piston Retraction Set	X	X	X
Primary Cylinder Bleeder Kit		X	X
Wheel Stud/Fastener Service Tools	X	X	X
Graphing Multimeter (GMM) and/or Digital Storage Oscilloscope (DSO)*			X

ASE AUTOMOBILE ACCREDITATION TASK LIST – ELECTRICAL/ELECTRONIC SYSTEMS – 2024					
For every task in Electrical/Electronic Systems, the following safety requirement must be strictly enforced:					
Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.					
Maintenance & Light Repair (MLR)		**Automobile Service Technology (AST)**		**Master Automobile Service Technology (MAST)**	
540 Hours		**840 Hours**		**1200 Hours**	
VI. ELECTRICAL/ELECTRONIC SYSTEMS		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**	
A. General		**A. General**		**A. General**	
1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1
2. Identify electrical/electronic system components and configurations.	P-1	2. Identify electrical/electronic system components and configurations.	P-1	2. Identify electrical/electronic system components and configurations.	P-1
3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1
4. Research the need to perform calibration/recalibration, initialization, or relearn procedure as required.	P-1	4. Perform calibration/recalibration, initialization, or relearn procedure as required.	P-1	4. Perform calibration/recalibration, initialization, or relearn procedure as required.	P-1

5. Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law).	P-1	5. Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law).	P-1	5. Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law).	P-1
6. Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow, and resistance.	P-1	6. Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance.	P-1	6. Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance.	P-1
7. Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.	P-1	7. Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.	P-1	7. Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.	P-1
8. Describe precautions related to the use of test lights.	P-3	8. Describe precautions related to the use of test lights.	P-3	8. Describe precautions related to the use of test lights.	P-3
9. Use fused jumper wires to check operation of electrical circuits per service information.	P-2	9. Use fused jumper wires to check operation of electrical circuits per service information.	P-1	9. Use fused jumper wires to check operation of electrical circuits per service information.	P-1
10. Use wiring diagrams to trace electrical/electronic circuits.	P-1	10. Use wiring diagrams during the diagnosis of electrical/electronic circuit problems.	P-1	10. Use wiring diagrams during the diagnosis of electrical/electronic circuit problems.	P-1
11. Measure key-off battery drain (parasitic draw).	P-2	11. Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine needed action.	P-1	11. Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine needed action.	P-1
12. Inspect and test fusible links, circuit breakers, and fuses.	P-1	12. Inspect and test fusible links, circuit breakers, and fuses; determine needed action	P-1	12. Inspect and test fusible links, circuit breakers, and fuses; determine needed action.	P-1

13. Repair and/or replace connectors, terminal ends, and wiring of electrical/electronic systems (including solder repair).	P-2	13. Inspect, test, repair, and/or replace components, connectors, terminals, harnesses, and wiring in electrical/electronic systems (including solder repairs); determine needed action.	P-1	13. Inspect, test, repair, and/or replace components, connectors, terminals, harnesses, and wiring in electrical/electronic systems (including solder repairs); determine needed action.	P-1
		14. Test and measure circuit using a digital storage oscilloscope (DSO) and/or graphing multimeter (GMM); interpret results; determine needed action.	P-2	14. Test and measure circuit using an digital storage oscilloscope (DSO) and/or graphing multimeter (GMM); interpret results; determine needed action.	P-1
VI. ELECTRICAL/ELECTRONIC SYSTEMS		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**	
B. Batteries (Low Voltage)		**B. Batteries (Low Voltage)**		**B. Batteries (Low Voltage)**	
1. Perform battery state-of-charge test; determine needed action.	P-1	1. Perform battery state-of-charge test; determine needed action.	P-1	1. Perform battery state-of-charge test; determine needed action.	P-1
2. Confirm proper battery capacity, size, type, and application for vehicle; perform battery capacity and load test as recommended by manufacturer.	P-1	2. Confirm proper battery capacity, size, type, and application for vehicle; perform battery capacity and load test as recommended by manufacturer; determine needed action.	P-1	2. Confirm proper battery capacity, size, type, and application for vehicle; perform battery capacity and load test as recommended by manufacturer; determine needed action.	P-1
3. Maintain or restore electronic memory functions as recommended by manufacturer.	P-2	3. Maintain or restore electronic memory functions as recommended by manufacturer.	P-2	3. Maintain or restore electronic memory functions as recommended by manufacturer.	P-2
4. Inspect and clean battery; check battery cables, connectors, clamps, and hold-downs.	P-1	4. Inspect and clean battery; check battery cables, connectors, clamps, and hold-downs.	P-1	4. Inspect and clean battery; check battery cables, connectors, clamps, and hold-downs.	P-1

5. Perform battery charging according to manufacturer's recommendations.	P-1	5. Perform battery charging according to manufacturer's recommendations.	P-1	5. Perform battery charging according to manufacturer's recommendations.	P-1
6. Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply according to manufacturer's recommendations.	P-1	6. Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply according to manufacturer's recommendations.	P-1	6. Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply according to manufacturer's recommendations.	P-1
7. Identify electrical/electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery.	P-2	7. Identify electrical/electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery.	P-2	7. Identify electrical/electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery.	P-2
VI. ELECTRICAL/ELECTRONIC SYSTEMS		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**	
C. Starting System (Low Voltage)		**C. Starting System (Low Voltage)**		**C. Starting System (Low Voltage)**	
1. Perform starter current draw test.	P-1	1. Perform starter current draw test; determine needed action.	P-1	1. Perform starter current draw test; determine needed action.	P-1
2. Perform starter circuit voltage drop tests.	P-1	2. Perform starter circuit voltage drop tests; determine needed action.	P-1	2. Perform starter circuit voltage drop tests; determine needed action.	P-1
3. Inspect and test starter relays and solenoids.	P-2	3. Inspect and test starter relays and solenoids; determine needed action.	P-2	3. Inspect and test starter relays and solenoids; determine needed action.	P-2
4. Remove and install starter in a vehicle.	P-3	4. Remove and install starter in a vehicle.	P-2	4. Remove and install starter in a vehicle.	P-1
5. Inspect and test switches, connectors, and wires of starter control circuits.	P-2	5. Inspect and test switches, connectors, and wires of starter control circuits; determine needed action.	P-1	5. Inspect and test switches, connectors, and wires of starter control circuits; determine needed action.	P-1

6. Demonstrate knowledge of an automatic idle-stop/start-stop system that uses a low-voltage starter to restart the engine.	P-2	6. Demonstrate knowledge of automatic idle-stop/start-stop system that uses a low-voltage starter to restart the engine..	P-1	6. Demonstrate knowledge of an automatic idle-stop/start-stop system that uses a low-voltage starter to restart the engine..	P-1
		7. Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition.	P-2	7. Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition.	P-1
		8. Diagnose a no-crank condition using a wiring diagram and test equipment; determine needed action.	P-2	8. Diagnose a no-crank condition using a wiring diagram and test equipment; determine needed action.	P-1
VI. ELECTRICAL/ELECTRONIC SYSTEMS		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**	
D. Charging System (Low Voltage)		**D. Charging System (Low Voltage)**		**D. Charging System (Low Voltage)**	
1. Perform charging system output test.	P-1	1. Perform charging system output test; determine needed action.	P-1	1. Perform charging system output test; determine needed action.	P-1
2. Inspect, adjust, and replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment.	P-1	2. Inspect, adjust, and replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment; determine needed action.	P-1	2. Inspect, adjust, and replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment; determine needed action.	P-1
3. Remove, inspect, and replace generator (alternator).	P-3	3. Remove, inspect, and replace generator (alternator); determine needed action.	P-2	3. Remove, inspect, and replace generator (alternator); determine needed action.	P-1
4. Perform charging circuit voltage drop tests.	P-2	4. Perform charging circuit voltage drop tests; determine needed action.	P-1	4. Perform charging circuit voltage drop tests; determine needed action.	P-1

		5. Diagnose charging system for causes of undercharge, no-charge, or overcharge conditions; determine needed action.	P-1	5. Diagnose charging system for causes of undercharge, no-charge, or overcharge conditions; determine needed action.	P-1
VI. ELECTRICAL/ELECTRONIC SYSTEMS		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**	
E. Lighting Systems		**E. Lighting Systems**		**E. Lighting Systems**	
1. Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); replace as needed.	P-1	1. Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); determine needed action.	P-1	1. Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); determine needed action.	P-1
2. Aim headlights.	P-2	2. Aim headlights.	P-2	2. Aim headlights.	P-2
		3. Diagnose the causes of brighter-than-normal, intermittent, dim, or no light operation; determine needed action.	P-1	3. Diagnose the causes of brighter-than-normal, intermittent, dim, or no light operation; determine needed action.	P-1
VI. ELECTRICAL/ELECTRONIC SYSTEMS		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**	
F. Instrument Cluster and Driver Information Systems		**F. Instrument Cluster and Driver Information Systems**		**F. Instrument Cluster and Driver Information Systems**	
1. Verify operation of instrument panel gauges and warning/indicator lights; reset maintenance indicators as required.	P-1	1. Verify operation of instrument panel gauges and warning/indicator lights; reset maintenance indicators as required.	P-1	1. Verify operation of instrument panel gauges and warning/indicator lights; reset maintenance indicators as required.	P-1
		2. Inspect and test gauges and gauge sensors/sending units for causes of abnormal readings; determine needed action.	P-2	2. Inspect and test gauges and gauge sensors/sending units for causes of abnormal readings; determine needed action.	P-1

		3. Diagnose the causes of incorrect operation of warning devices and other driver information systems; determine needed action.	P-2	3. Diagnose the causes of incorrect operation of warning devices and other driver information systems; determine needed action.	P-1
VI. ELECTRICAL/ELECTRONIC SYSTEMS		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**		**VI. ELECTRICAL/ELECTRONIC SYSTEMS**	
G. Body Electrical Systems		**G. Body Electrical Systems**		**G. Body Electrical Systems**	
1. Demonstrate knowledge of vehicle comfort, convenience, access, safety, and related systems operation.	P-3	1. Diagnose vehicle comfort, convenience, access, safety, and related systems operation; determine needed action.	P-2	1. Diagnose vehicle comfort, convenience, access, safety, and related systems operation; determine needed action	P-2
2. Remove and reinstall door panel.	P-2	2. Remove and reinstall door panel.	P-1	2. Remove and reinstall door panel.	P-1
3. Describe the operation of keyless entry/remote-start systems.	P-3	3. Diagnose operation of security/anti-theft systems and related circuits (such as: theft deterrent, door locks, remote keyless entry, remote start, and starter/fuel disable); determine needed action.	P-2	3. Diagnose operation of security/anti-theft systems and related circuits (such as: theft deterrent, door locks, remote keyless entry, remote start, and starter/fuel disable); determine needed action.	P-1
4. Describe disabling and enabling procedures for supplemental restraint system (SRS); verify indicator lamp operation.	P-2	4. Describe disabling and enabling procedures for supplemental restraint system (SRS); verify indicator lamp operation.	P-1	4. Describe disabling and enabling procedures for supplemental restraint system (SRS); verify indicator lamp operation.	P-1
5. Verify windshield wiper and washer operation; replace wiper blades.	P-1	5. Verify windshield wiper and washer operation; replace wiper blades.	P-1	5. Verify windshield wiper and washer operation; replace wiper blades.	P-1

		6. Diagnose operation of entertainment/infotainment systems and related circuits (such as: radio, DVD, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine needed action.	P-2	6. Diagnose operation of entertainment/infotainment and related circuits (such as: radio, DVD, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine needed action.	P-2
		7. Diagnose operation of safety systems and related circuits (such as: horn, airbags, seat belt pretensioners, occupancy classification, wipers, and washers); determine needed action.	P-2	7. Diagnose operation of safety systems and related circuits (such as: horn, airbags, seat belt pretensioners, occupancy classification, wipers, and washers); determine needed action.	P-1
		8. Diagnose body electronic system circuits using a scan tool; check for module communication errors (data communication bus systems); determine needed action.	P-2	8. Diagnose body electronic systems circuits using a scan tool; check for module communication errors (data communication bus systems); determine needed action.	P-1
		9. Describe the process for software transfer, software updates, or reprogramming of electronic modules.	P-2	9. Describe the process for software transfer, software updates, or reprogramming of electronic modules.	P-1
				10. Demonstrate knowledge of advanced driver assistance systems (ADAS) and related circuits (such as: adaptive cruise control, lane keeping, collision avoidance, parking assist, and back-up camera).	P-2
				11. Calibrate a vehicle's advanced driver assistance system (ADAS).	P-2

VI. ELECTRICAL/ELECTRONIC SYSTEMS		VI. ELECTRICAL/ELECTRONIC SYSTEMS		VI. ELECTRICAL/ELECTRONIC SYSTEMS	
H. xEV Systems		**H. xEV Systems**		**H. xEV Systems**	
1. Locate procedures to safely de-energize/disable and energize/enable high-voltage systems.	P-3	1. Locate procedures to safely de-energize/disable and energize/enable high-voltage systems.	P-3	1. Locate procedures to safely de-energize/disable and energize/enable high-voltage systems.	P-3
				2. Identify potential safety and materials handling concerns associated with high-voltage battery/energy storage systems.	P-3
				3. Demonstrate knowledge of special multimeters, insulated tools, and other test equipment required for use in high-voltage circuits.	P-3
				4. Demonstrate knowledge of personal protective equipment (PPE) required for use while servicing high-voltage circuits.	P-3
				5. Demonstrate knowledge of the use of a live-dead-live/zero potential test to verify isolation of the high-voltage battery/energy storage system.	P-3
				6. Demonstrate knowledge of the testing and verification of ground circuit isolation between vehicle chassis ground and the high-voltage circuits and components.	P-3
				7. Demonstrate knowledge of safe handling procedures associated with high-voltage A/C compressors and wiring.	P-3
				8. Demonstrate knowledge of high-voltage thermal management systems.	P-3

				9. Demonstrate knowledge of safe handling procedures associated with high-voltage powertrain components, such as electric motors.	P-3
EE Tasks - MLR		**EE Tasks - AST**		**EE Tasks - MAST**	
P-1	21	P-1	31	P-1	42
P-2	12	P-2	17	P-2	8
P-3	6	P-3	2	P-3	10

ASE AUTOMOBILE ACCREDITATION TOOL LIST – SPECIALTY EQUIPMENT – 2024			
Note: if a program does not teach a particular task, tools associated with that task are not required.			
ELECTRICAL/ELECTRONIC SYSTEMS	**MLR**	**AST**	**MAST**
Connector Pick Tool Set	X	X	X
Molding and Trim Removal Tool(s)	X	X	X
Headlight Aimer or Screen	X	X	X
Heat Gun (or equivalent for heat shrinking operations)	X	X	X
Terminal Tension (Pin Drag) Test Kit/Terminal Probe Kit (or equivalent)	X	X	X
Wire and Terminal Repair Kit	X	X	X
Graphing Multimeter (GMM) and/or Digital Storage Oscilloscope (DSO)*		X	X

Shop/Lab Equipment (recommended - MAST)

- xEV Vehicle Safety Kit
- Electrical Insulating Gloves – must meet CAT 0 1000 VAC and 1500 VDC electrical safety glove rating – may have expired certification if used for demonstration only
- Leather Gloves to go over Electrical Insulating Gloves
- xEV charging equipment (level 1 or higher)
- Insulated Retrieval Hook
- Insulation Tester/Multimeter and leads – must meet CAT III 600-volt, CAT III 1000-volt, or CAT IV 600-volt rating

ASE AUTOMOBILE ACCREDITATION TASK LIST – HEATING, VENTILATION, AND AIR CONDITIONING (HVAC) – 2024					
For every task in Heating, Ventilation, and Air Conditioning (HVAC), the following safety requirement must be strictly enforced:					
Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.					
Maintenance & Light Repair (MLR)		**Automobile Service Technology (AST)**		**Master Automobile Service Technology (MAST)**	
540 Hours		**840 Hours**		**1200 Hours**	
VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)		**VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**		**VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**	
A. General		**A. General**		**A. General**	
1. Research vehicle service information, including refrigerant/oil/fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information, including refrigerant/oil/fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information, including refrigerant/oil/fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1
2. Identify heating, ventilation, and air conditioning (HVAC) components and configurations.	P-1	2. Identify heating, ventilation, and air conditioning (HVAC) components and configurations.	P-1	2. Identify heating, ventilation, and air conditioning (HVAC) components and configurations.	P-1
3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	3. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1
4. Demonstrate knowledge of the steps of an A/C performance test as recommended by manufacturer.	P-2	4. Perform A/C system performance test as recommended by manufacturer; interpret results; determine needed action.	P-1	4. Perform A/C system performance test as recommended by manufacturer; interpret results; determine needed action.	P-1

5. Identify abnormal operating noises in the A/C system.	P-3	5. Identify abnormal operating noises in the A/C system; determine needed action.	P-2	5. Identify abnormal operating noises in the A/C system; determine needed action.	P-2
6. Visually inspect A/C system for signs of leaks.	P-1	6. Leak test A/C system; determine needed action.	P-1	6. Leak test A/C system; determine needed action.	P-1
7. Verify heating and air conditioning concerns.	P-1	7. Verify and interpret heating and air conditioning concerns; determine needed action.	P-1	7. Verify and interpret heating and air conditioning concern; determine needed action.	P-1
8. Research the need to place a vehicle in service mode before servicing and diagnosing the HVAC system.	P-1	8. Place a vehicle in service mode as needed before servicing and diagnosing the HVAC system.	P-1	8. Place a vehicle in service mode as needed before servicing and diagnosing the HVAC system.	P-1
		9. Identify refrigerant type; test for sealant/contaminants; select and connect proper gauge set/test equipment; record temperature and pressure readings.	P-1	9. Identify refrigerant type; test for sealant/contaminants; select and connect proper gauge set/test equipment; record temperature and pressure readings.	P-1
		10. Inspect condition/quantity of refrigerant oil removed from A/C system; determine needed action.	P-1	10. Inspect condition/quantity of refrigerant oil removed from A/C system; determine needed action.	P-1
		11. Determine recommended oil and oil capacity for system application and component(s) replacement.	P-1	11. Determine recommended oil and oil capacity for system application and component(s) replacement.	P-1
VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)		**VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**		**VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**	
B. Refrigeration System Components		**B. Refrigeration System Components**		**B. Refrigeration System Components**	
1. Inspect and/or replace A/C compressor drive belts, pulleys, and tensioners.	P-1	1. Inspect, remove, and/or replace A/C compressor drive belts, pulleys, and tensioners; determine needed action.	P-1	1. Inspect, remove, and/or replace A/C compressor drive belts, pulleys, tensioners; determine needed action.	P-1

2. Inspect for proper A/C condenser airflow.	P-2	2. Inspect for proper A/C condenser airflow; determine needed action.	P-1	2. Inspect for proper A/C condenser airflow; determine needed action.	P-1
3. Inspect evaporator housing condensation drain.	P-1	3. Inspect evaporator housing condensation drain; determine needed action.	P-1	3. Inspect evaporator housing condensation drain; determine needed action.	P-1
		4. Inspect, test, and/or service A/C compressor clutch components and/or assembly; determine needed action.	P-2	4. Inspect, test, and/or service A/C compressor clutch components and/or assembly; determine needed action.	P-2
		5. Remove, inspect, and reinstall, and/or replace A/C compressor and mountings; determine recommended oil type and quantity.	P-2	5. Remove, inspect, reinstall, and/or replace A/C compressor and mountings; determine recommended oil type and quantity.	P-1
		6. Remove and inspect A/C system hoses, lines, fittings, O-rings, seals, and service valves; determine needed action.	P-2	6. Remove and inspect A/C system hoses, lines, fittings, O-rings, seals, and service valves; determine needed action.	P-2
		7. Remove, inspect, and replace receiver/drier, accumulator/drier or desiccant; determine recommended oil type and quantity.	P-2	7. Remove, inspect, and replace receiver/drier, accumulator/drier, or desiccant; determine recommended oil type and quantity.	P-2
		8. Remove, inspect, and install expansion valve or orifice (expansion) tube.	P-2	8. Remove, inspect, and install expansion valve or orifice (expansion) tube.	P-1
		9. Diagnose A/C system conditions that cause the protection devices (pressure, thermal, and/or control module) to interrupt system operation; determine needed action.	P-2	9. Diagnose A/C system conditions that cause the protection devices (pressure, thermal, and/or control module) to interrupt system operation; determine needed action.	P-1

		10. Determine procedure to remove and reinstall evaporator; determine required oil type and quantity.	P-2	10. Determine procedure to remove and reinstall evaporator; determine required oil type and quantity.	P-2
		11. Remove, inspect, reinstall, and/or replace condenser; determine required oil type and quantity.	P-3	11. Remove, inspect, reinstall, and/or replace condenser; determine required oil type and quantity.	P-2
VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)		**VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**		**VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**	
C. Heating, Ventilation, and Engine Cooling Systems		**C. Heating, Ventilation, and Engine Cooling Systems**		**C. Heating, Ventilation, and Engine Cooling Systems**	
1. Inspect engine cooling and heater systems hoses and pipes.	P-1	1. Inspect engine cooling and heater systems hoses and pipes; determine needed action.	P-1	1. Inspect engine cooling and heater systems hoses and pipes; determine needed action.	P-1
		2. Inspect and test coolant control valve(s); determine needed action.	P-2	2. Inspect and test coolant control valve(s); determine needed action	P-2
		3. Diagnose temperature control problems in the HVAC system related to the engine cooling system, including electric heating; determine needed action.	P-3	3. Diagnose temperature control problems in the HVAC system related to the engine cooling system, including electric heating; determine needed action.	P-2
		4. Determine procedure to remove, inspect, reinstall, and/or replace heater core; properly refill system.	P-2	4. Determine procedure to remove, inspect, reinstall, and/or replace heater core; properly refill system.	P-2
VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)		**VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**		**VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**	
D. Operating Systems and Related Controls		**D. Operating Systems and Related Controls**		**D. Operating Systems and Related Controls**	

1. Inspect HVAC system ducts, doors, hoses, cabin filters, and outlets.	P-1	1. Inspect HVAC system ducts, doors, hoses, cabin filters, and outlets; determine needed action.	P-1	1. Inspect HVAC system ducts, doors, hoses, cabin filters, and outlets; determine needed action.	P-1
2. Identify the source of HVAC system odors.	P-2	2. Identify the source of HVAC system odors.	P-2	2. Identify the source of HVAC system odors.	P-2
		3. Inspect and test HVAC system blower motors, resistors, switches, relays, wiring, and protection devices; determine needed action.	P-1	3. Inspect and test HVAC system blower motors, resistors, switches, relays, wiring, and protection devices; determine needed action.	P-1
		4. Diagnose A/C compressor control systems; determine needed action.	P-2	4. Diagnose A/C compressor control systems; determine needed action.	P-1
		5. Diagnose malfunctions in the vacuum, mechanical, and/or electrical components, and controls of the HVAC system; determine needed action.	P-2	5. Diagnose malfunctions in the vacuum, mechanical, and/or electrical components, and controls of the HVAC system; determine needed action.	P-2
		6. Inspect, test, remove and/or replace HVAC system control panel; determine needed action.	P-2	6. Inspect, test, remove and/or replace HVAC system control panel; determine needed action.	P-2
		7. Check operation of automatic HVAC control systems; determine needed action.	P-2	7. Check operation of automatic HVAC control systems; determine needed action.	P-2
VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)		**VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**		**VII. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)**	
E. Refrigerant Recovery, Recycling, and Handling		**E. Refrigerant Recovery, Recycling, and Handling**		**E. Refrigerant Recovery, Recycling, and Handling**	

1. Demonstrate knowledge of the requirement to recover, recycle, and handle refrigerants using proper equipment and procedures.	P-1	1. Demonstrate knowledge of the requirement to recover, recycle, and handle refrigerants using proper equipment and procedures.	P-1	1. Demonstrate knowledge of the requirement to recover, recycle, and handle refrigerants using proper equipment and procedures	P-1
		2. Use and maintain refrigerant handling equipment according to equipment manufacturer's standards.	P-1	2. Use and maintain refrigerant handling equipment according to equipment manufacturer's standards.	P-1
		3. Identify A/C system refrigerant; test for sealants/contaminants; recover, evacuate, and charge A/C system; add refrigerant oil as required.	P-1	3. Identify A/C system refrigerant; test for sealants/contaminants; recover, evacuate, and charge A/C system; add refrigerant oil as required.	P-1
		4. Recycle, label, and store refrigerant.	P-1	4. Recycle, label, and store refrigerant.	P-1
HA Tasks - MLR		**HA Tasks - AST**		**HA Tasks - MAST**	
P-1	11	P-1	20	P-1	24
P-2	3	P-2	15	P-2	13
P-3	1	P-3	2	P-3	0

ASE AUTOMOBILE ACCREDITATION TOOL LIST – SPECIALTY EQUIPMENT – 2024			
Note: if a program does not teach a particular task, tools associated with that task are not required.			
HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)	**MLR**	**AST**	**MAST**
A/C Compressor Clutch Service Tools		X	X
Dye Injection Kit		X	X
A/C Leak Detector (to meet current industry standard)		X	X
A/C Manifold Gauge Set or equivalent (to meet current industry standard)		X	X
A/C Refrigerant Identification Equipment		X	X
A/C Refrigerant Recovery/Recycling/Recharging Station (to meet current industry standard)		X	X
Thermometer(s)		X	X
A/C Sealant Detector Kit		X	X

ASE AUTOMOBILE ACCREDITATION TASK LIST – ENGINE PERFORMANCE – 2024					
For every task in Engine Performance, the following safety requirement must be strictly enforced:					
Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.					
Maintenance & Light Repair (MLR)		**Automobile Service Technology (AST)**		**Master Automobile Service Technology (MAST)**	
540 Hours		**840 Hours**		**1200 Hours**	
VIII. ENGINE PERFORMANCE		**VIII. ENGINE PERFORMANCE**		**VIII. ENGINE PERFORMANCE**	
A. General		**A. General**		**A. General**	
1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1	1. Research vehicle service information such as fluid type, vehicle service history, service precautions, technical service bulletins, and recalls including xEVs and vehicles equipped with advanced driver assistance systems (ADAS).	P-1
2. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	2. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1	2. Retrieve and record on-board diagnostic DTCs, monitor status and freeze frame data; clear codes and data when directed.	P-1
3. Demonstrate knowledge of proper engine cooling system operation.	P-1	3. Verify proper engine cooling system operation; determine needed action.	P-1	3. Verify proper engine cooling system operation; determine needed action.	P-1
4. Demonstrate knowledge of camshaft timing including engines equipped with variable valve timing (VVT) systems.	P-1	4. Verify correct camshaft timing including engines equipped with variable valve timing (VVT) systems; determine needed action.	P-1	4. Verify correct camshaft timing including engines equipped with variable valve timing (VVT) systems; determine needed action.	P-1
		5. Verify engine performance concerns; determine needed action.	P-1	5. Verify engine performance concerns; determine needed action.	P-1

		6. Diagnose abnormal engine noises or vibration concerns; determine needed action.	P-3	6. Diagnose abnormal engine noises or vibration concerns; determine needed action.	P-2
		7. Diagnose the cause of excessive oil consumption, coolant consumption, unusual exhaust color, odor, and sound; determine needed action.	P-2	7. Diagnose the cause of excessive oil consumption, coolant consumption, unusual exhaust color, odor, and sound; determine needed action.	P-2
		8. Perform engine manifold pressure tests (vacuum/boost); determine needed action.	P-1	8. Perform engine manifold pressure tests (vacuum/boost); determine needed action.	P-1
		9. Perform cylinder power balance test; determine needed action.	P-2	9. Perform cylinder power balance test; determine needed action.	P-1
		10. Perform cylinder cranking and running compression tests; determine needed action.	P-1	10. Perform cylinder cranking and running compression tests; determine needed action.	P-1
		11. Perform cylinder leakage test; determine needed action.	P-1	11. Perform cylinder leakage test; determine needed action.	P-1
VIII. ENGINE PERFORMANCE		**VIII. ENGINE PERFORMANCE**		**VIII. ENGINE PERFORMANCE**	
B. Computerized Controls		**B. Computerized Controls**		**B. Computerized Controls**	
1. Identify computerized control system components and configurations.	P-1	1. Identify computerized control system components and configurations.	P-1	1. Identify computerized control system components and configurations.	P-1
		2. Access and use service information to perform step-by-step (troubleshooting) diagnosis.	P-1	2. Access and use service information to perform step-by-step (troubleshooting) diagnosis.	P-1

		3. Perform active tests of actuators using a scan tool; determine needed action.	P-1	3. Perform active tests of actuators using a scan tool; determine needed action.	P-1
		4.. Demonstrate knowledge of OBD readiness flags, monitors, and drive cycle for repair verification.	P-1	4. Demonstrate knowledge of OBD readiness flags, monitors, and drive cycle for repair verification.	P-1
		5. Inspect and test computerized engine control system sensors, powertrain/engine control module (PCM/ECM), actuators, and circuits using a graphing multimeter (GMM), digital storage oscilloscope (DSO), and/or scan tool; determine needed action.	P-2	5. Inspect and test computerized engine control system sensors, powertrain/engine control module (PCM/ECM), actuators, and circuits using a graphing multimeter (GMM), digital storage oscilloscope (DSO), and/or scan tool; determine needed action.	P-1
		6. Describe the process for reprogramming or recalibrating the powertrain/engine control module (PCM/ECM).	P-1	6. Describe the process for reprogramming or recalibrating the powertrain/engine control module (PCM/ECM).	P-1
				7. Diagnose the causes of emissions or driveability concerns with stored or active diagnostic trouble codes (DTC); obtain, graph, and interpret scan tool data.	P-1
				8. Diagnose emissions or driveability concerns without stored or active diagnostic trouble codes; determine needed action.	P-1

				9. Diagnose driveability and emissions problems resulting from malfunctions of interrelated systems (cruise control, security alarms, suspension controls, traction controls, HVAC, automatic transmissions, non-OEM installed accessories, or similar systems); determine needed action.	P-2
VIII. ENGINE PERFORMANCE		**VIII. ENGINE PERFORMANCE**		**VIII. ENGINE PERFORMANCE**	
C. Ignition System		**C. Ignition System**		**C. Ignition System**	
1. Identify ignition system components and configurations.	P-1	1. Identify ignition system components and configurations.	P-1	1. Identify ignition system components and configurations.	P-1
2. Remove and replace spark plugs; inspect secondary ignition components for wear and damage.	P-2	2. Remove and replace spark plugs; inspect secondary ignition components for wear and damage; determine needed action.	P-1	2. Remove and replace spark plugs; inspect secondary ignition components for wear and damage; determine needed action.	P-1
		3. Diagnose no-starting, hard starting, engine misfire, poor driveability, spark knock, power loss, poor mileage, and emissions concerns related to ignition system problems; determine needed action.	P-2	3. Diagnose no-starting, hard starting, engine misfire, poor driveability, spark knock, power loss, poor mileage, and emissions concerns related to ignition system problems; determine needed action.	P-1
		4. Inspect and test crankshaft and camshaft position sensor(s); determine needed action.	P-2	4. Inspect and test crankshaft and camshaft position sensor(s); determine needed action.	P-1
		5. Inspect, test, and/or replace ignition control module and/or powertrain/engine control module; reprogram/initialize as needed.	P-2	5. Inspect, test, and/or replace ignition control module and/or powertrain/engine control module; reprogram/initialize as needed.	P-2

VIII. ENGINE PERFORMANCE		VIII. ENGINE PERFORMANCE		VIII. ENGINE PERFORMANCE	
D. Fuel, Air Induction, and Exhaust Systems		**D. Fuel, Air Induction, and Exhaust Systems**		**D. Fuel, Air Induction, and Exhaust Systems**	
1. Identify fuel, air induction, and exhaust system components and configurations.	P-1	1. Identify fuel, air induction, and exhaust system components and configurations.	P-1	1. Identify fuel, air induction, and exhaust system components and configurations.	P-1
2. Replace fuel filter(s) where applicable.	P-3	2. Replace fuel filter(s) where applicable.	P-3	2. Replace fuel filter(s) where applicable.	P-3
3. Inspect, service, or replace air filters, filter housings, and intake duct work.	P-1	3. Inspect, service, or replace air filters, filter housings, and intake duct work.	P-1	3. Inspect, service, or replace air filters, filter housings, and intake duct work.	P-1
4. Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields for leaks and unmetered air.	P-1	4. Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields for leaks and unmetered air; determine needed action.	P-1	4. Inspect integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shields for leaks and unmetered air; determine needed action.	P-1
5. Inspect condition of exhaust system hangers, brackets, clamps, and heat shields.	P-1	5. Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine needed action.	P-1	5. Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine needed action.	P-1
6. Check and refill diesel exhaust fluid (DEF).	P-3	6. Check and refill diesel exhaust fluid (DEF).	P-3	6. Check and refill diesel exhaust fluid (DEF).	P-3
		7. Check fuel for quality, composition, and contamination; determine needed action.	P-2	7. Check fuel for quality, composition, and contamination; determine needed action.	P-1
		8. Inspect and test fuel pump(s) and pump control system for pressure,	P-1	8. Inspect and test fuel pump(s) and pump control system for pressure, regulation, and volume; determine needed action.	P-1

		regulation, and volume; determine needed action.			
		9. Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air.	P-1	9. Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air.	P-1
		10. Inspect, test, and/or replace fuel injectors on low- and high-pressure systems.	P-2	10. Inspect, test, and/or replace fuel injectors on low- and high-pressure systems.	P-1
		11. Verify proper idle speed; determine needed action.	P-1	11. Verify proper idle speed; determine needed action.	P-1
		12. Perform exhaust system back-pressure test; determine needed action.	P-2	12. Perform exhaust system back-pressure test; determine needed action.	P-2
		13. Demonstrate knowledge of the operation of turbocharger/supercharger systems.	P-2	13. Demonstrate knowledge of the operation of turbocharger/supercharger systems.	P-2
				14. Diagnose hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, engine run-on, and emissions problems related to fuel, air induction, and exhaust system problems; determine needed action.	P-2
VIII. ENGINE PERFORMANCE		**VIII. ENGINE PERFORMANCE**		**VIII. ENGINE PERFORMANCE**	
E. Emissions Control Systems		**E. Emissions Control Systems**		**E. Emissions Control Systems**	

1. Identify emission control system components and configurations.	P-1	1. Identify emission control system components and configurations.	P-1	1. Identify emission control system components and configurations.	P-1
2. Inspect, test, and service, and/or replace positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses.	P-2	2. Inspect, test, service, and/or replace positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; determine needed action.	P-2	2. Inspect, test, service, and/or replace positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; determine needed action.	P-2
		3. Diagnose oil leaks, emissions, and driveability concerns caused by the positive crankcase ventilation (PCV) system; determine needed action.	P-2	3. Diagnose oil leaks, emissions, and driveability concerns caused by the positive crankcase ventilation (PCV) system; determine needed action.	P-2
		4. Diagnose emissions and driveability concerns caused by the exhaust gas recirculation (EGR) system; inspect, test, service and/or replace electrical/electronic sensors, controls, wiring, tubing, exhaust passages, coolers, vacuum/pressure controls, filters, and hoses of exhaust gas recirculation (EGR) system; determine needed action.	P-2	4. Diagnose emissions and driveability concerns caused by the exhaust gas recirculation (EGR) system; inspect, test, service and/or replace electrical/electronic sensors, controls, wiring, tubing, exhaust passages, coolers, vacuum/pressure controls, filters, and hoses of exhaust gas recirculation (EGR) systems; determine needed action.	P-1
		5. Inspect and test electrical/electronically operated components and circuits of secondary air injection systems; determine needed action.	P-3	5. Inspect and test electrical/electronically operated components and circuits of secondary air injection systems; determine needed action.	P-3
		6. Diagnose emissions and driveability concerns caused by catalytic converter system; determine needed action.	P-1	6. Diagnose emission and driveability concerns caused by catalytic converter system; determine needed action.	P-1

		7. Diagnose emissions and driveability concerns caused by the evaporative emissions control (EVAP) system; determine needed action.	P-1	7. Diagnose emissions and driveability concerns caused by the evaporative emissions control (EVAP) system; determine needed action.	P-1
EP Tasks - MLR		**EP Tasks - AST**		**EP Tasks - MAST**	
P-1	11	P-1	25	P-1	34
P-2	2	P-2	13	P-2	9
P-3	2	P-3	4	P-3	3

ASE AUTOMOBILE ACCREDITATION TOOL LIST – SPECIALTY EQUIPMENT – 2024			
Note: if a program does not teach a particular task, tools associated with that task are not required.			
ENGINE PERFORMANCE	**MLR**	**AST**	**MAST**
Compression Tester		X	X
Cylinder Power Balance Tester (Scan Tool/Manual Method)		X	X
Evaporative Emissions Control System (EVAP) Tester		X	X
Exhaust Backpressure Tester (or equivalent)		X	X
Fuel Injection Pressure Gauge Set with Adapters		X	X
Gasoline Quality Testing Kit (or equivalent)		X	X
Graphing Multimeter (GMM) and/or Digital Storage Oscilloscope (DSO)*		X	X
Infrared Thermometer (or appropriate substitute)	X	X	X
Injector Pulse Tester (or equivalent)		X	X
Leak Detector (Smoke or Nitrogen)		X	X
Oxygen Sensor Socket(s)		X	X
Pinch-off Pliers		X	X
Sensor/Sending Unit Socket(s)		X	X
Spark Plug Thread Repair Tool(s)	X	X	X
Spark Tester		X	X
Vacuum/Pressure Gauge (or equivalent)	X	X	X
*Also necessary to accomplish tasks in other AST and MAST categories.			

Tools and Equipment

Local employer needs and the availability of funds are key factors for determining each program's structure and operation. The ASE Education Foundation Program Standards recognize that not all programs have the same needs, nor do all programs teach 100 % of the automobile tasks. Therefore, the basic philosophy for the tools and equipment requirement is as follows: *for all tasks which are taught in the program, the training should be as thorough as possible with the tools and equipment necessary for those tasks*. In other words, if a program does not teach a particular task, the tool from the tool list associated with that task is not required.

The tool lists are organized into three basic categories*: Hand Tools, General Lab/Shop Equipment,* and *Specialty Tools and Equipment.* The Specialty Tools and Equipment section is further separated into the three Automobile Accreditation levels. When referring to the tools and equipment list, please note the following:

A. The organization of the tool list is not intended to dictate how a program organizes its tool crib or student tool sets (i.e., which tools should be in a student set, if utilized, and which should be in the tool crib or shop area).

B. Quantities for each tool or piece of equipment are determined by the program needs; however, sufficient quantities to provide quality instruction should be on hand.

C. For *Specialty Tools and Equipment*, the program need only have those tools for the level of accreditation being sought. In addition, if a program does not teach a particular task, tools associated with that task are not required.

D. Programs may meet the equipment requirements by borrowing special equipment or providing for off-site instruction (e.g., in a dealership or independent repair shop). Use of borrowed or off-site equipment *must* be appropriately documented.

E. No specific brand names for tools and equipment are specified or required.

F. Although the Program Standards recommend that programs encourage students to begin to build their own tool sets, this is not a requirement. However, many employers require an entry-level automobile technician to provide his/her own basic hand tool set.

- **Tools and Equipment – Hand Tools**

(Contained in individual sets or the tool crib in sufficient quantities to permit efficient instruction)

Air Nozzle (meeting OSHA requirements)
Allen (Wrench or Socket) Set - Standard (.050"-3/8")
Allen (Wrench or Socket) Set - Metric (2mm - 8mm, 10mm, 12mm)
Battery Post Cleaner
Battery Terminal Pliers
Battery Terminal Puller
Chisels:
Cape 5/16"
Cold 3/8", 3/4"
Chisel Holder
Claw Type Pickup Tool
Combination Wrenches:
Standard (1/4" – 1 1/4") (optional)
Metric (7mm - 24mm)
Crowfoot Wrench Set - Metric
Crowfoot Wrench Set – Standard (optional)
Ear Protection
Feeler Gauge (Blade Type):
.002" - .040"
.006mm - .070mm
Files:
Coarse 6" and 12"
Fine 6" and 12"
Half Round 12"
Round 6" and 12"
Flare Nut (tubing) Wrenches:
3/8" - 3/4"
10mm - 17mm
Flashlight
Fuse Puller/Remover
Fused Jumper Wire Set (with various adapters)
Hack Saw
Hammers:
16 oz. Ball Peen
Brass
Dead Blow Plastic Mallet
Plastic Tip
Rubber Mallet
Inspection Mirror
Magnetic Pickup Tool

Pliers:
Combination 6"
Hose Clamp
Locking Jaw
Needle Nose 6"
Side Cutting
Slip Joint
Pry Bars:
Rolling Head
Straight
Punches:
Center
Brass Drift
Pin 1/8", 3/16", 1/4", 5/16 "
Taper 3/8", 1/2", 5/8"
Safety Glasses (meeting OSHA requirements)
Scraper:
Plastic
Gasket 1"
Screwdriver - Blade Type:
Stubby
6", 9", 12"
Offset
Screwdriver - Phillips:
Stubby #1, #2
6" #1, #2
12" #3
Offset #2
Screwdriver - Impact Driver Set
Socket Set - 1/4" Drive:
1/4" - 1/2" Standard Depth (optional)
1/4" - 1/2" Deep (optional)
6mm - 12mm Standard Depth
6mm - 12mm Deep
2”, 4” Extensions
Ratchet
Socket Set - 3/8" Drive:
5/16" - 3/4" Standard Depth (6 point) (optional)
3/8" - 3/4" Deep (6 point) (optional)
10mm - 19mm Standard Depth (6 point)

10mm - 19mm Deep (6 point)
3", 5", 10" Extensions
Flexhead Ratchet
Ratchet
Spark Plug Sockets 5/8", 13/16", 9/16"
Spark Plug Sockets 14mm
Speed Handle
Universal Joint
Flexible Socket Set 10mm - 19mm
Socket Set - 1/2" Drive:
7/16" - 1 1/8" Standard Depth (optional)
7/16" - 1 1/8" Deep (optional)
10mm - 24mm Standard Depth
10mm - 24mm Deep
3", 6", 12" Extensions
Flex Handle (Breaker Bar)
Ratchet
Spark Plug Feeler Gauge (Gap Tool)
Tape Measure – Standard and Metric
Tire Pressure Gauge
Tire Tread Depth Gauge
Torque Wrench:
3/8" Drive (10 - 250 lb. in.)
3/8" Drive (5 - 75 lb. ft.)
1/2" Drive (50 - 250 lb. ft.)
Torx® Set:
T-8 to T-55
Torx® External Set:
E-4 to E-18
Torx® Plus Set External and Internal (optional)
Wire Brush

- **Tools and Equipment – General Lab / Shop Equipment**

The tools and equipment on this list are used in general lab/shop work but are not generally considered to be individually owned hand tools. A well-equipped, accredited program should have all these general tools and equipment readily available and in sufficient quantity to provide quality instruction.

Air or Electric Chisel Set (various bits)
Air Compressor and Hoses
Air Pressure Regulator
Air or Electric Ratchet (1/4” and 3/8” drive)
Automotive Stethoscope (electronic recommended)
Axle Stands (Jack Stands) (2 Ton Minimum)
Axle Support Stands (Screw Jacks)
Low Voltage Battery Charger (to meet current industry standard)
Low Voltage Battery/Starter/Charging System Tester (to meet current industry standard)
Bearing Packer (hand operated)
Belt Tension/Wear Gauge
Bench or Pedestal Grinder (including guards)
Calipers – 0-6”, 0-125mm
Comprehensive Puller Set
Coolant/Combustion Gas Detector (recommended)
Coolant Tester – refractometer type
Cooling System Pressure Tester and Adapters
Creeper
Cylinder Leakage Tester
Dial Indicator with Flex Arm and Clamp Base
Digital Multimeter (DMM) with various lead sets (enough to meet instruction goals)
Drain Pans
Drill - 3/8" variable speed, reversible
Drill - 1/2" variable speed, reversible
Drill Bit Set (Twist)
Electric Hot Air Tool
Engine Coolant Recovery Equipment or Recycler or Coolant Disposal Contract Service (in accordance with state and local requirements)
Engine Coolant Vacuum Refill Tool (optional)
Engine Hoist/Crane
Extension Cords
Face Shields
Fender Covers
Floor Jack (2 Ton Minimum)
Handheld Vacuum Pump
Hood Prop
Hydraulic Press with adapters

Impact Socket Sets - 3/8" Drive (Standard - optional)
Impact Socket Sets – 3/8 Drive (8mm-19mm)
Impact Sockets - 1/2" Drive (7/16" - 1 1/8") (optional)
Impact Sockets - 1/2" Drive (12mm – 24mm)
Impact Sockets – 1/2” Drive Deep (30 mm, 32 mm, 36mm)
Impact Wrench - 1/2" Drive
Impact Wrench - 3/8" Drive
Induction Heater, MAP-gas, or Oxy-Acetylene Torch Set (in accordance with state and local requirements)
Jumper Cables
Micrometer (Depth) 0-6”, 0-125mm
Micrometers - (Outside Type) 0-1", 1-2", 2-3", 3-4", 4-5"
Oil Can - Pump Type
Oil Filter Wrench and Sockets
Parts Cleaning Tank and Gloves (in accordance with state and local requirements, aqueous based recommended)
Scan Tool OBDII w/CAN capability or Personal Computer (PC) with equivalent interface (appropriate capability to support tasks taught)
Screw Extractor Set
Seat Covers
Serpentine Belt Tensioner Tools
Shop/Work Lights (Non-incandescent)
Snap Ring Pliers Set - external
Snap Ring Pliers Set - internal
Soldering Tool
Spark Plug Boot Puller
Tap and Die Set – Standard (optional)
Tap and Die Set – Metric
Temperature Sensing Device
Thread Repair Insert Kit
Thread Repair (Thread Chaser) Set
Tire Inflator Chuck
Tube Quick Disconnect Tool Set
Tubing Bender
Tubing Cutter/Flaring Set (Double-lap and ISO)
Ultraviolet Leak Detection Kit
Used Oil Receptacle with extension neck and funnel

Valve Core Removing Tool
Vehicle Lift (ALI® certified for new purchases)
Waste Fluid Storage Container(s) and Disposal Method (in accordance with state and local requirements)
Wheel Chocks
Workbenches with vises

- ## Educational Terms

1. **ARTICULATION:** A formal written agreement, usually between a secondary and post-secondary institution that are geographically within a reasonable daily commuting distance of each other. The agreement will clearly denote students completing specific secondary courses in accordance with predetermined performance criteria will have partially completed commensurate requirements for a completion certificate or diploma awarded by the postsecondary institution. Commensurate requirements could be in the form of credit equivalents, advanced placement, task completion, etc. at the post-secondary institution.

2. **CURRICULUM:** All the objectives of the lesson plan with respect to the content and learning activities, arranged in a sequence for a particular instructional area. An orderly arrangement of integrated subjects, activities, time allocations, and experiences which students pursue for the attainment of a specific educational goal.

3. **COMPETENCY: (Hands-on)** - Performance of task to the level or degree specified in the performance standard and curriculum for the task.

4. **COMPETENCY:(Written)** – Understanding of task to the level or degree specified in the performance standard and curriculum for the task.

5. **CRITERION REFERENCED MEASURE(S):** An exercise based on a performance objective for a task and designed to measure attainment of that objective. (Also called performance test(s) or criterion-referenced test.)

6. **E-LEARNING:** An electronically based, instructor managed, and student driven learning process—may be outside or in place of the regularly scheduled classroom and support of lab/shop required time frame—*and includes integrated and scored auditable assessment and reporting* in compliance with the ASE Education Foundation's e-learning general framework criteria.

7. **GOAL:** A statement of the intended outcome of participation in the training program.

8. **HOUR**: For ASE Education Foundation purposes, an instructional hour as defined by a school's accrediting entity (e.g. state agency (SEA) or regional or national accrediting body). Different SEAs or accrediting bodies may count instructional hours differently. For example, if a 90-minute block is recognized as two hours of instruction by a school's accrediting entity and meets 180 days a year, you would calculate 2 x 180 = 360 instructional hours for the year for ASE program accreditation.

9. **LIVE WORK:** The processing, assignment, and student performance of the appropriate tasks on vehicles donated by manufacturers or other sources, customer-owned, and other training vehicles.

10. **LEARNING MANAGEMENT SYSTEM (LMS):** A software application for the administration, documentation, tracking, reporting, automation, and delivery of educational materials and student assessments.

11. **MASTERY:** (See Competency – Hands-on and Competency - Written).

12. **OBJECTIVE, PERFORMANCE:** A written statement describing an intended outcome (competent task performance) in terms of student performance. (also called "behavioral" objective or instructional objective).

13. **ON-VEHICLE SERVICE AND REPAIR WORK:** The processing, assignment, and student performance of the appropriate tasks on vehicles donated by manufacturers or other sources, customer-owned, and other training vehicles.

14. **PERSONAL CHARACTERISTIC:** Attributes that are not readily measurable and are generally in the affective or cognitive domains.

15. **PRIORITY RATINGS:** Indicates the minimum percentage of tasks that a program must include in its curriculum in order to be accredited.

16. **STANDARD:** "...Something established for use as a rule or basis of comparison in measuring or judging capacity, quantity, content, extent, value, quality, etc." Webster's New World Dictionary (1991)

17. **STANDARD – (PERFORMANCE):** A written specification of the results of acceptable task performance.

18. **STANDARD – (PERSONAL):** An attribute or characteristic of an individual that facilitates entry into or advancement within an occupation.

19. **STANDARD – (PROGRAM):** A specific quality or desired characteristic of a training program designed to prepare individuals for employment or advancement.

20. **TASK:** A psychomotor or cognitive entry-level learning activity consisting of one or more measureable steps accomplished through an instructor presentation, demonstration, visualization, or a student application.

21. **TRAINING STATION:** An area with appropriate tools and equipment, large enough to allow the development of both safety and competency in task performance.

22. **WORK-BASED LEARNING:** For ASE program accreditation purposes, work-based learning is a formalized and structured credit bearing instructional dimension of the automotive training program that is an integral part of the institution's master schedule, is available to all automotive students at the appropriate grade level, and meets the following criteria:

a) A written customized training plan and performance standards that each student is expected to meet, to be signed off by the student, the student's parent or legal guardian, the authorized work-based learning site representative, and the work-based learning coordinator.

b) A written agreement between the sponsoring educational institution and the work-based learning site that is in compliance with state/federal rules and regulations governing work-based learning programs.

c) A written plan of oversight and supervision designating who has the authority to coordinate, monitor and evaluate the work-based learning program, including individual student performance.

Must or shall is an imperative need, duty, or requirement; an essential or indispensable item; mandatory.

Should is used to express a recommendation, not mandatory, but attainment would increase program quality.

May or could expresses freedom to follow a suggested alternative.

- ## Technical Terms

1. **ADJUST** – To bring components to specified operational settings.
2. **ALIGN** – To restore the proper position of components.
3. **ANALYZE** – Assess the condition of a component or system.
4. **ASSEMBLE (REASSEMBLE)** – To fit together the components of a device or system.
5. **BALANCE** – To establish correct linear, rotational or weight relationship.
6. **BLEED** – To remove air from a closed system.
7. **CHARGE** – To bring to a specified state, e.g., battery or air conditioning system.
8. **CHECK** – To verify condition by performing an operational or comparative examination.
9. **CLEAN** – To rid components of foreign matter for the purpose of reconditioning, repairing, measuring, or reassembling.
10. **DEGLAZE** – To remove a smooth glossy surface.
11. **DEMONSTRATE** – Give a practical exhibition and explanation. For example: how a system or component works, or how a procedure is performed.
12. **DESCRIBE** – To represent or give an account of the component or system.
13. **DETERMINE** – To establish the procedure to be used to perform the necessary repair.
14. **DETERMINE NECESSARY/NEEDED ACTION** – Indicates that the diagnostic routine(s) is the primary emphasis of a task. The student is required to perform the diagnostic steps and communicate the diagnostic outcomes and corrective actions required addressing the concern or problem. The training program determines the communication method (worksheet, test,

verbal communication, or other means deemed appropriate) and whether the corrective procedures for these tasks are actually performed.

15. **DIAGNOSE** – To identify the cause of a problem.

16. **DISASSEMBLE** – To separate a component's parts as preparation for cleaning, inspection, or service.

17. **DISCHARGE** – To empty a storage device or system.

18. **EVACUATE** – To remove air, fluid, or vapor from a closed system by use of a vacuum pump.

19. **FLUSH** – To internally clean a component or system.

20. **HIGH VOLTAGE** – Automotive system voltages greater than 30 VAC or 60 VDC.

21. **HONE** – To restore cylinder wall finish by creating fine crosshatch imperfections on the surface of the cylinder's bore.

22. **IDENTIFY** – To describe the component or system.

23. **INSPECT** – To verify condition of component or system via visual examination.

24. **INTERPRET** – To explain the operation/condition of component or system.

25. **JUMP START** – To use an auxiliary power supply to assist a battery to crank an engine.

26. **LOCATE** – Determine or establish a specific spot or area.

27. **MEASURE** – To determine existing dimensions/values for comparison to specifications.

28. **NETWORK** – A system of interconnected electrical modules or devices.

29. **ON-BOARD DIAGNOSTICS (OBD)** – Diagnostic protocol which monitors computer inputs and outputs for failures.

30. **PARASITIC DRAW** – Electrical loads which are still present when the ignition is OFF.

31. **PERFORM** – To accomplish a procedure in accordance with established methods and standards.

32. **PERFORM NECESSARY ACTION** – Indicates that the student is to perform the diagnostic routine(s) and perform the corrective action item. Where various scenarios (conditions or situations) are presented in a single task, at least one of the scenarios must be accomplished.

33. **PRIMARY CYLINDER** – Control device that converts mechanical force into hydraulic pressure, typically used in automotive brake and clutch systems. This device controls secondary cylinder(s) located on the other end of the hydraulic system.

34. **PURGE** – To remove air or fluid from a closed system.

35. **REMOVE** – To disconnect and separate a component from a system.

36. **REPAIR** – To restore a malfunctioning component or system to operating condition.

37. **REPLACE** – To exchange a component; to reinstall a component.

38. **RESURFACE** – To restore correct finish.

39. **SECONDARY CYLINDER** – Actuator that converts hydraulic pressure into mechanical force, typically used in automotive brake and clutch systems.

40. **SERVICE** – To perform a procedure as specified in the owner's or service manual.

41. **TEST** – To verify condition through the use of meters, gauges or instruments.

42. **TORQUE** – To tighten a fastener to specified degree or tightness (in a given order or pattern if multiple fasteners are involved on a single component).

43. **VERIFY** – To confirm that a problem exists after hearing the customer's concern; or to confirm the effectiveness of a repair.

44. **VOLTAGE DROP** – A reduction in voltage (electrical pressure) caused by the resistance in a component or circuit.

45. **xEV** – Any electrified propulsion vehicle with a high-voltage system, including, but not limited to, HEV, PHEV, PEV, BEV, FCEV, and EV (SAE J1715-1 SEP 2022).

• Standards 11 & 12 – Limits for Work-Based Learning and E-Learning

STANDARD 11 – WORK-BASED LEARNING

WRITTEN POLICIES AND PROCEDURES MUST BE USED FOR ALL PROGRAM-SANCTIONED WORK-BASED LEARNING AND APPRENTICESHIP ACTIVITIES.

(This standard applies only to programs that are using work-based learning or apprenticeship training to meet minimum program hour requirements for the program's type and level of accreditation. A maximum of 25% of the instructional-hours requirement may be met by applicable work-based learning activities, e-learning activities, or a combination of both work-based learning and e-learning activities.)

Standard 11.1 – Standards
The work-based learning component must be an integral part of the automotive program and available to all students. Students spend part of the scheduled time, either on a daily basis or in a block-time configuration, on-site in related classroom instruction and part of the scheduled time off-site in a related and structured work environment.

Standard 11.2 – Agreements
All legally binding agreements should be written and signed by the student, the student's parent (if the student is under 18 years of age), the employer and the program instructor or the institution's designated work-based learning coordinator.

Standard 11.3 – Supervision
A supervising instructor or supervising work-based learning coordinator should be assigned responsibility, authority, and time to coordinate and monitor work-based learning components.

STANDARD 12 – E-LEARNING

WRITTEN POLICIES AND PROCEDURES MUST BE FOLLOWED WHEN E-LEARNING CURRICULAR MATERIALS ARE USED OUTSIDE OF SCHEDULED CLASSROOM/LAB/SHOP TIME.

(This standard applies only to programs that are using e-learning to meet minimum program hour requirements. A maximum of 25% of the instructional-hours requirement may be met by applicable work-based learning activities, e-learning activities, or a combination of both work-based learning and e-learning activities.)

Standard 12.1 – Access
Students must have access to the appropriate technology needed to access e-learning materials.

Standard 12.2 – Curriculum and Student Progress
All content/tasks taught by e-learning must be identified and a record of each student's progress must be maintained through the use of a Learning Management System (LMS).

Standard 12.3 – Advisory Committee Input
E-learning, for the purpose of meeting hour requirements, should be discussed and approved by the Advisory Committee.

- **Program Hours, Instructor Qualifications, Update Training Requirement, P-1/P-2/P-3 Percentages, and Evaluation Team Members**

1. PROGRAM HOURS

Programs must meet the following hour requirements based on the level of accreditation sought.

Maintenance & Light Repair	**540 hours** combined classroom and lab/ shop instructional activities
Automobile Service Technology	**840 hours** combined classroom and lab/ shop instructional activities
Master Automobile Service Technology	**1200 hours**

combined classroom and lab/
shop instructional activities

The ASE Education Foundation accepts what each school's accrediting entity (e.g. state education agency (SEA) or regional or national accrediting body) defines as an instructional hour. Because different SEAs or accrediting bodies may count instructional hours differently, this policy accommodates the unique situation in each school.

For example, if a 90-minute block is recognized as two hours of instruction by a school's accrediting entity and meets 180 days a year, you would calculate 2 x 180 = 360 instructional hours for the year. If it is a 2-year program where the time block for the second year is the same as the first, you would calculate 360 X 2 =720 total program hours.

2. INSTRUCTOR QUALIFICATIONS

MLR: All MLR instructors must hold current ASE certification in Auto Maintenance & Light Repair (G1), Suspension & Steering (A4), Brakes (A5), and Electrical/Electronic Systems (A6).

AST: All AST instructors must hold current ASE certification in Auto Maintenance & Light Repair (G1), Electrical/Electronic Systems (A6), and in the Automobile area(s) (A1, A2, A3, A4, A5, A7, and/or A8) they teach. AST programs must have one or more instructors currently certified in each of the following areas: G1 and A1 through A8.

MAST: All MAST instructors must hold current ASE certification in Auto Maintenance & Light Repair (G1), Electrical/Electronic Systems (A6), and in the Automobile area(s) (A1, A2, A3, A4, A5, A7, and/or A8) they teach. MAST instructors teaching Engine Performance must also hold current ASE certification as an Advanced Engine Performance Specialist (L1). MAST instructors teaching Hybrid/Electric vehicle (xEV) diagnosis and repair *should* also hold current ASE certification as a Light Duty Hybrid/Electric Vehicle Specialist (L3) and xEV Electrical Safety Level 2. MAST programs must have one or more instructors currently certified in each of the following areas: G1, A1 through A8, and L1. L3 and xEV Electrical Safety Level 2 are recommended if the program covers Hybrid/Electric (xEV) vehicle diagnosis and repair.

ASE Certification Requirement Summary	
MLR	All instructors must be certified in G1, A4, A5, and A6.
AST	All instructors must be certified in G1, A6 and any other areas taught (A1-A8). The program must have one or more instructors certified in each of these: G1, A1-A8.
MAST	All instructors must be certified in G1, A6 and any other areas taught (A1-A8). Instructors teaching Engine Performance must also be certified in L1. Instructors teaching Hybrid/Electric vehicle (xEV) diagnosis and repair *should* be certified in L3 and xEV Electrical Safety Level 2. The program must have one or more instructors certified in each of these: G1, A1-A8, and L1. The program *should* have one or more instructors certified in L3 and xEV Electrical Safety Level 2 if Hybrid/Electric vehicle (xEV) diagnosis and repair is taught.

MASTER CERTIFICATION: At all levels, current certification as an ASE Master Automobile Technician (A1-A8) satisfies the requirements above for G1 certification.

3. UPDATE TRAINING REQUIREMENT

All instructors must complete a minimum of twenty (20) hours of recognized automotive industry technical update training each year, relevant to their program. Automotive instructors may substitute ten (10) hours of documented hands-on work as a technician in a retail or fleet automotive repair business outside the school (e.g., part-time work or summer externship) for one (1) hour of update technical training, up to a maximum of ten (10) hours of update technical training each year, toward the annual update training requirement. The work must be related to the areas they teach and take place in the same year for which substitute credit is sought. The ASE Education Foundation reserves the right to verify all hands-on work information reported and determine whether it meets all requirements.

4. P-1, P-2, and P-3 PERCENTAGES

The Program Standards recognize that program content requirements vary by program type and by regional employment needs. Therefore, flexibility has been built into the task list by assigning each task a priority number. **A program must include in their curriculum the designated percentage of tasks (or more) in each priority numbered category (P-1, P-2, and P-3) to be accredited.** For MLR, AST, and MAST Automobile programs, the following minimum percentages are required:

- **At least 90% of all Priority 1 (P-1) tasks must be taught**
- **At least 75% of all Priority 2 (P-2) tasks must be taught**
- **At least 50% of all Priority 3 (P-3) tasks must be taught**

5. EVALUATION TEAM MEMBERS

The program requesting accreditation is responsible for recruiting and recommending on-site evaluation team members. The ETL must approve individuals recommended by the program. The on-site evaluation team members must have current or prior experience as service technicians.

Evaluation team members must have at least three years full-time experience as a general automobile technician and currently employed as an automotive technician, educator, trainer, field service engineer, OEM or aftermarket technical specialist, or auto service facility service manager or owner.

ASE automobile certification is recommended but not required. If you cannot find team members to meet the above requirements, consult with your ASE Education Foundation field manager.

In addition to the ETL, the Initial Accreditation evaluation team has three team members. If the program is manufacturer-specific (e.g., ASEP, ASSET, T-TEN, etc.) it is recommended that the team members be from dealers associated with that manufacturer. If the program is generic, it is recommended the team members be from a mixture of dealer and aftermarket repair facilities.

In addition to the ETL, the Renewal of Accreditation evaluation team has two team members. If the program is manufacturer-specific (e.g., ASEP, ASSET, T-TEN, etc.) it is recommended the team members be from dealers associated with that manufacturer. If the program is generic, it is recommended the team members be from a mixture of dealer and aftermarket repair facilities.

Each program requesting accreditation must also identify their choice for an alternate evaluation team member should one of the other team members be unable to participate on the date(s) of the evaluation.

Team members may be advisory committee members as long as they did not participate in the program self-evaluation.

Team members must not be former instructors or graduates of the program within the past three years or relatives of the administrator or instructor.

- **Task List Priority Item Totals**

Maintenance & Light Repair

P-1 =	104	90% =	94 tasks
P-2 =	55	75% =	41 tasks
P-3 =	31	50% =	16 tasks

Foundational Tasks & Workplace Skills = 55 tasks/skills

Automobile Service Technology

P-1 =	179	90% =	161 tasks
P-2 =	127	75% =	95 tasks
P-3 =	20	50% =	10 tasks

Foundational Tasks & Workplace Skills = 55 tasks/skills

Master Automobile Service Technology

P-1 =	219	90% =	197 tasks
P-2 =	149	75% =	112 tasks
P-3 =	37	50% =	19 tasks

Foundational Tasks & Workplace Skills = 55 tasks/skills