Collision Standards Summary of Changes

Effective January 1, 2021

Summary

- Review held February 25-27, 2020
- 23 subject matter experts contributed, including secondary and post-secondary instructors, state Dept. of Education, working technicians and representatives from Gerber, Caliber Collision, Service King, 3M, Car-O-Liner, Axalta, Sherwin Williams, Chief Automotive, and I-CAR.
- No changes to the areas of Accreditation offered (Structural, Non-Structural, Mechanical & Electrical, Painting and Refinishing)
- Welding tasks are still required as part of Structural and Non-Structural areas of accreditation
- Damage Analysis, Estimating and Customer Service tasks are still required for all accredited Collision programs
- No changes to minimum hours for program accreditation
- No changes to Instructor qualifications
- Edits, additions, and deletions made to the task lists, tool lists, and equipment lists
- Minor changes to the number of priority tasks in each area
- Available to apply for in January 1, 2021
- Deletions are struck through in red and additions are marked in blue

TASK LIST AND ASSUMPTIONS

The ASE Education Foundation task list was reviewed and updated in February 2020.~~April 2016~~. A national committee was assembled in Leesburg, Virginia to review the tasks used in the collision repair and refinish accreditation program. The committee consisted of individuals representing collision repair and refinish shop owners and technicians, collision repair and refinish instructors, collision repair and refinish equipment and parts suppliers.~~, and the Inter-Industry Conference on Auto Collision Repair (I-CAR).~~

The committee reviewed the standards, task list, tools and equipment list, program hours, and instructor qualifications. The committee had the most current National Institute for Automotive Service Excellence (ASE) collision repair and refinish task lists for reference purposes.

All the tasks are assigned a "High Priority" designation. **Accredited programs must include at least 95% of the HP-I tasks and 90% of the HP-G tasks in the curriculum.** Please refer to the Task List Information in the Policies section for additional information on the requirements for instruction on tasks**.**

Theory instruction and hands-on performance of all the basic tasks will provide initial training for **entry-level** employment in the ~~automotive service~~Collision Repair and Refinish 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 c~~Collision ~~r~~Repair and ~~r~~Refinish service field.

1. It is assumed that:
   * in all areas, appropriate safety, theory, 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; and

* the student has received the necessary training to locate and use current reference and training materials from accepted industry publications;

2. It is assumed that:
   * all components are steel unless otherwise specified;
   * current manufacturer's required/recommended repair procedures are available for each vehicle used in instruction;
   * all diagnostic and repair tasks described in this document are to be accomplished in accordance with manufacturer's recommended procedures/specifications as published;
   * where manufacturer's required/recommended guidelines are not available, published industry guidelines are used; and
   * all tools and equipment comply with applicable federal, state and local regulations.

3. It is assumed that:
   * individual training programs being evaluated for accreditation should have written and detailed performance standards for each task covered and taught in the curriculum;
   * learning progress of students will be monitored and evaluated against these performance standards;
   * 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:
   * individual courses of study will differ across collision repair and refinish technician training programs;
   * development of appropriate learning delivery systems and tests which monitor student progress will be the responsibility of the individual training program.

5. It is assumed that:

* all students will receive instruction and training on labor, safety, and environmental laws in accordance with ~~as required by~~ Federal, State and Local Regulations. ~~in the storage, handling, and use of Hazardous Materials as required in Hazard Communication Title 29, Code of Federal Regulation Part 1910.1200, 'Right to Know Law', and state and local requirements; hazardous and toxic materials will be handled, removed and recycled or disposed of according to federal, state, and local regulations.~~

TASK LIST

STRUCTURAL ANALYSIS AND DAMAGE REPAIR

For every task in Structural Analysis and Damage Repair, the following safety requirements must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing and the use of ~~gloves; respiratory protection; eye protection;~~proper Personal Protection Equipment (PPE); ~~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. Identify vehicle system precautions and/or inspections to include but not limited to:~~hazard types ~~(~~Supplemental Restraint System (SRS) Inspection, Advanced Driver Assistance Systems (ADAS), hybrid/electric/alternative fuel vehicles~~)~~, locations and recommended procedures before inspecting or replacing components.

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

A. Safety Precautions

1. Select and use proper personal safety equipment; take necessary precautions with hazardous operations and materials in accordance with federal, state, and local regulations. HP-I

2. Locate OEM procedures to identify material and composition of the vehicle being repaired (mild steel, high strength steel, ultra-high strength steel, etc.). HP-I

~~2.~~3. Locate procedures and precautions that may apply to the ~~substrate of the component of the~~ vehicle being repaired. HP-I

~~3.~~4. Identify vehicle system ~~hazard types~~precautions and/or inspections to include but not limited to ~~(~~supplemental restraint system (SRS), advanced driver assistance systems (ADAS), hybrid/electric/alternative fuel vehicles~~)~~, locations and recommended procedures before inspecting or replacing components. HP-I

5. Perform vehicle clean-up; complete quality control using a checklist on operations performed. HP-I

~~4. Select and use a NIOSH approved air purifying respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA regulation 1910.134 and applicable state and local regulation. HP-I~~

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

~~B.~~ B. Frame Inspection and Repair

1. Measure and diagnose structural damage using a metric tape measure and a tram gauge. HP-I

2. ~~Attach vehicle to anchoring devices.~~Properly install vehicle on to a frame bench/rack. HP-G

3. Analyze, straighten and align mash (collapse) damage. HP-G

4. Analyze, straighten and align sag damage. HP-G

5. Analyze, straighten and align side sway damage. HP-G

6. Analyze, straighten and align twist damage. HP-G

7. Analyze, straighten and align diamond frame damage. HP-G

8. Remove and replace damaged structural components. HP-G

9. Remove and rReplace protective coatings; restore corrosion protection to repaired or replaced frame areas and anchoring locations. HP-G

10. Analyze and identify misaligned or damaged steering, suspension, and powertrain mounting points and components. HP-G

11. Align or replace misaligned or damaged steering, suspension, and powertrain mounting points and components. ~~that can cause vibration, steering, and wheel alignment problems.~~ HP-G

12. Identify heat limitations and monitoring procedures for structural components. HP-G

13. Demonstrate an understanding of structural foam applications. HP-G

14. Measure and diagnose structural damage using a three-dimensional measuring system (mechanical, electronic, laser), etc. HP-G

15. Determine the extent of the direct and indirect damage and the direction of impact; document the methods and sequence of repair. HP-I

16. Analyze and identify crush/collapse zones. HP-I

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

C. Unibody and Unitized Structure Inspection, Measurement, and Repair

1. Analyze and identify misaligned or damaged steering, suspension, and powertrain mounting points that can cause vibration, steering, and chassis alignment problems. HP-G

2. Align or replace misaligned or damaged steering, suspension, and powertrain mounting points that can cause vibration, steering and chassis alignment problems. HP-G

3. Measure and diagnose unibody damage using a metric tape measure~~r~~ and tram gauge. HP-I

4. Measure and diagnose unibody vehicles using a dedicated (fixture) measuring system. HP-G

5. Diagnose and measure unibody vehicles using a three-dimensional measuring system (mechanical, electronic, and laser, etc.). HP-G

6. Determine the extent of the direct and indirect damage and the direction of impact; plan and document the methods and sequence of repair.	HP-I
7. Attach anchoring devices to vehicle; remove or reposition components as necessary.	~~HP-I~~ HP-G
8. Straighten and align roof rails/headers and roof panels.	HP-G
9. Straighten and align rocker panels and pillars.	HP-G
10. Straighten and align vehicle openings, and floor pans.	HP-G
11. Straighten and align quarter panels, wheelhouse assemblies, and rear body sections (including rails and suspension/powertrain mounting points).	HP-G
12. Straighten and align front-end sections (aprons, strut towers, upper and lower rails, steering, and suspension/power train mounting points, etc.).	HP-G
13. ~~Identify substrate and repair~~Determine structural repair component or replacement recommendations.	~~HP-I~~ HP-G
14. Identify proper cold stress relief methods.	HP-I
~~15. Repair damage using power tools and hand tools to restore proper contours and dimensions.~~	~~HP-I~~
~~16.~~15. Determine sectioning procedures of a steel body structure.	HP-I
~~17.~~16. Remove and replace damaged structural components.	HP-G

~~18. Restore corrosion protection to repaired or replaced structural areas, and anchoring locations.~~ ~~HP-I~~

~~19.~~17. Determine the extent of damage to aluminum structural components; repair, weld, or replace. HP-G

~~20.~~18. Analyze and identify crush/collapse zones. HP-I

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

D. Stationary Glass

1. Identify considerations for removal, handling, one time use parts, and installation of advanced glass systems (comfort and safety ~~systems~~features) ~~rain sensors, navigation, cameras, and collision avoidance systems~~). HP-G

2. Remove and reinstall or replace modular glass using recommended materials. HP-G

3. Check for water leaks, dust leaks, and wind noise. HP-G

4. Identify considerations for pre-scan, post-scan, and recalibration procedures. HP-G

SA Tasks	
HP-I	12~~16~~
HP-G	30~~27~~
	42~~43~~

NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR

(BODY COMPONENTS)

For every task in Non-Structural Analysis and Damage Repair (Body Components), the following safety requirements must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing and ~~the use of gloves; respiratory protection; eye protection; hearing protection;~~ proper Personal Protection Equipment (PPE); 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. Identify vehicle system ~~hazard types~~precautions and/or inspections to include but not limited to: ~~(~~Supplemental Restraint System (SRS) Inspection, Advanced Drive Assistance Systems (ADAS), hybrid/electric/alternative fuel vehicles~~)~~, locations and recommended procedures before inspecting or replacing components.

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

A. Safety Precautions

1. Select and use proper personal safety equipment; take necessary precautions with hazardous operations and materials in accordance with federal, state, and local regulations. HP-I
2. Locate OEM procedures to identify material and composition of the vehicle being repaired (mild steel, high strength steel, ultra-high strength steel, aluminum, etc.). HP-I

~~2.~~3. Locate procedures and precautions that may apply to the vehicle being repaired. HP-I

~~3.~~4. Identify vehicle system- precautions and/or inspections to include but not limited to ~~hazard types (~~supplemental restraint system (SRS), advanced driver assistance systems (ADAS), hybrid/electric/alternative fuel vehicles~~)~~, locations and recommended procedures before inspecting or replacing components. HP-I

5. Perform vehicle clean-up; complete quality control using a checklist on operations performed. HP-I

~~4. Select and use a NIOSH approved air purifying respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA regulation 1910.134 and applicable state and local regulation. HP-I~~

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

B. Preparation

1. Review damage report and analyze damage to determine appropriate methods for overall repair; develop and document a repair plan. HP-I

2. Inspect, remove, protect, label, store, inventory, and reinstall exterior trim and moldings. HP-I

3. Inspect, remove, protect, label, store, inventory, and reinstall interior trim and components. HP-I

4. Inspect, remove, protect, label, store, inventory, and reinstall body panels and components that may interfere with or be damaged during repair. HP-I

5. Inspect, remove, protect, label, store, inventory, and reinstall vehicle mechanical and electrical components that may interfere with or be damaged during repair. HP-G

6. Protect panels, glass, interior parts, and other vehicles adjacent to the repair area. HP-I

7. Soap and water wash entire vehicle; complete pre-repair inspection checklist. HP-I

8. Prepare damaged area using water-based and solvent-based cleaners. HP-I

9. Remove corrosion protection, undercoating, sealers, and other protective coatings as necessary to perform repairs. HP-I

10. Inspect, remove, and reinstall repairable plastics and other components for off-vehicle repair. HP-I

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

C. Outer Body Panel Repairs, Replacements, and Adjustments

1. Inspect/locate direct, indirect, or hidden damage and direction of impact. HP-I

2. Inspect, remove and replace ~~mechanically fastened~~ welded steel panel or panel assemblies. HP-G

3. Determine the extent of damage to aluminum body panels; repair or replace. HP-G

4. Inspect, remove, replace, and align hood, hood hinges, and hood latch. HP-I

5. Inspect, remove, replace, and align deck lid, lid hinges, and lid latch. HP-I

6. Inspect, remove, replace, and align doors, latches, hinges, and related hardware. HP-I

7. Inspect, remove, replace and align tailgates, hatches, liftgates and sliding doors. HP-G

8. Inspect, remove, replace, overhaul, and align bumpers, covers, reinforcements, guards, impact absorbers, and mounting hardware. HP-I

9. Inspect, remove, replace and align fenders, and related panels. HP-I

10. Restore corrosion protection during and after the repair. HP-I

11. Replace door skins. HP-G

12. Restore sound deadeners and foam materials. HP-G

13. Perform panel bonding and weld bonding. HP-G

14. Diagnose and repair water leaks, dust leaks, and wind noise. HP-G

15. Identify one-time use fasteners. HP-G

16. Weld damaged or torn steel body panels; repair broken welds. HP-G

17. Inspect, identify labels/decals and replace as necessary. HP-G

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

D. Metal Finishing and Body Filling

1. Prepare a panel for body filler by abrading or removing the coatings; featheredge, ~~and~~ refine scratches, and clean the surface before the application of body filler. HP-I

2. Locate and repair surface irregularities and straighten contours on a damaged body panel using power tools, hand tools, and weld-on pulling attachments. HP-I

3. Demonstrate hammer and dolly techniques. HP-I

4. Heat shrink stretched panel areas to proper contour. HP-G

5. Cold shrink stretched panel areas to proper contour. HP-I

6. Identify body filler defects; correct the cause and condition. (Pinholing, ghosting, staining, over catalyzing, etc.) HP-I

7. Identify different types of body fillers. HP-G

8. ~~Mix and apply body filler~~ Shape body filler to contour; finish sand. HP-I

~~8. Shape body filler to contour; finish sand.~~ HP-I

9. Perform proper metal finishing techniques for aluminum. HP-G

10. Perform proper application of body filler to aluminum. HP-G

11. ~~Straighten contours of damaged panels to a suitable condition for body fillings or metal finishing using power tools, hand tools, and weld-on pulling attachments~~. Locate and repair surface irregularities and straighten contours on a damaged panel using Glue-Pulling Dent Repair (GPDR). ~~HP-I~~HP-G

12. Mix and apply body filler. HP-I

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

E. Moveable Glass and Hardware

1. Inspect, adjust, overhaul repair or replace window regulators, run channels, glass, power mechanisms, and related controls. HP-I

2. Inspect, adjust, repair, remove, reinstall or replace weather-stripping. HP-G

3. Inspect, remove, repair or replace, and adjust removable power operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs. HP-G

4. Inspect, remove, reinstall, and align convertible top and related mechanisms. HP-G

5. ~~Initialize~~ Identify or recalibrate electrical components ~~as needed~~that may need to be initialized. HP-G

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

F. Plastics, ~~and~~ Adhesives, and Welding

1. Identify the types of plastics; determine repairability. HP-I

2. Clean and prepare the surface of plastic parts; identify the types of plastic repair procedures. HP-I

3. Repair rigid, semi-rigid, and flexible plastic panels. HP-I

4. Remove, replace, or repair damaged areas ~~from~~ of rigid exterior composite panels. HP-G

NS Tasks	
HP-I	~~35~~34~~31~~
HP-G	24~~20~~

5. Replace bonded rigid exterior composite body panels; straighten or align panel supports.	~~59~~58~~51~~
6. Repair plastic parts by welding (nitrogen, -airless ~~welding~~).	HP-G
7. Perform a single--sided adhesively bonded cosmetic repair.	HP-I
8. Perform a double--sided adhesively bonded repair.	HP-I
9. Perform an adhesively bonded or welded tab repair.	HP-I
10. Shape and reform damaged plastic.	HP-G

MECHANICAL AND ELECTRICAL COMPONENTS

For every task in Mechanical and Electrical Components, the following safety requirements must be strictly enforced:

Comply with personal and environmental safety practices associated with ~~clothing and the use of gloves; respiratory protection; eye protection~~proper Personal Protection Equipment (PPE); 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. Identify vehicle system ~~hazard types~~precautions and/or inspections to include but not limited to: ~~(~~Supplemental Restraint System (SRS) Inspection, Advanced Driver Assistance Systems (ADAS), hybrid/electric/alternative fuel vehicles~~),~~ locations and recommended procedures before inspecting or replacing components.

III. MECHANICAL AND ELECTRICAL COMPONENTS

A. Safety Precautions

1. Select and use proper personal safety equipment; take necessary precautions with hazardous operations and materials in accordance with federal, state, and local regulations.	HP-I

2. Locate OEM procedures to identify material ~~&~~and composition of the vehicle being repaired (mild steel, high strength steel, ultra-high strength steel, aluminum, etc.) HP-I

~~2.~~3. Locate procedures and precautions that may apply to the vehicle being repaired. HP-I

~~3.~~4. Identify vehicle system ~~hazard types~~precautions and/or inspections to include but not limited to ~~(~~supplemental restraint system (SRS), advanced driver assistance systems (ADAS), hybrid/electric/alternative fuel vehicles~~),~~ locations and recommended procedures before inspecting or replacing components. HP-I

5. Perform vehicle clean-up; complete quality control using a checklist on operations performed. HP-I

~~4. Select and use a NIOSH approved air purifying respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA regulation 1910.134 and applicable state and local regulation. HP-I~~

III. MECHANICAL AND ELECTRICAL COMPONENTS

B. Suspension and Steering

1. Perform visual inspection and measuring checks to identify steering and suspension collision damage. HP-G

2. Identify one–time use fasteners. HP-I

3. Clean, inspect, and prepare reusable fasteners. HP-I

4. Remove, replace, inspect or adjust power steering pump, pulleys, belts, hoses, fittings and pump mounts. HP-G

5. Remove and replace power steering gear (non-rack and pinion type). HP-G

6. Inspect, remove, and replace power rack and pinion steering gear and related components. HP-G

7. Inspect and replace parallelogram steering linkage components. HP-G

8. Inspect, remove and replace upper and lower control arms and related components. HP-G

9. Inspect, remove and replace steering knuckle/spindle/hub assemblies (including bearings, races, seals, etc.). HP-G

10. Inspect, remove and replace front suspension system coil springs and spring insulators (silencers). HP-G

11. Inspect, remove, replace, and adjust suspension system torsion bars, and mounts. HP-G

12. Inspect, remove and replace stabilizer bar bushings, brackets, and links. HP-G

13. Inspect, remove and replace MacPherson strut or assembly, upper bearing, and mount. HP-G

14. Inspect, remove, and replace rear suspension system transverse links, control arms, stabilizer bars, bushings, and mounts. HP-G

15. Inspect, remove, and replace suspension system leaf spring(s) and related components. HP-G

16. Inspect axle assembly for damage and misalignment. HP-G

17. Inspect, remove and replace shock absorbers. HP-G

18. Diagnose, inspect, adjust, repair or replace active suspension systems and associated lines and fittings. HP-G

19. Measure vehicle ride height and wheel-base~~; determine necessary action~~ according to manufacturer specifications. HP-I

20. Inspect, remove, replace, and align front and rear frame (cradles/subframe). HP-G

21. Diagnose and inspect steering wheel, steering column, and components. HP-G

22. Verify proper operation of steering systems including electronically controlled, hydraulic and electronically assisted steering systems. HP-G

23. Diagnose front and rear suspension system noises and body sway problems; determine necessary action. HP-G

24. Diagnose vehicle wandering, pulling, hard steering, bump steer, memory steering, torque steering, and steering return problems; determine necessary action. HP-G

25. Demonstrate an understanding of wheel, suspension, and steering alignments (caster, camber, toe, SAI etc.). HP-G

~~26. Diagnose tire wear patterns; determine cause.~~ ~~HP-I~~

~~27.~~26. Inspect tires; identify tire wear patterns, direction of rotation and location; check tire size, identify nitrogen or air, check tire pressure monitoring system (TPMS) and adjust air pressure. HP-I

~~28.~~27. Diagnose wheel/tire vibration, shimmy, tire pull (lead), wheel hop problems; determine needed repairs. HP-G

~~29.~~28. Measure wheel, tire, axle, and hub runout; determine needed repairs. HP-I

~~30.~~29. Reinstall wheels and torque lug nuts. HP-I

~~31.~~30. Perform initialization or calibration procedures following suspension and/or steering system repairs. HP-G

31. Perform a tire pressure monitoring system (TPMS) recalibration. HP-G

32. Lift the vehicle for inspection, service, and repair by properly raising and supporting the vehicle. HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

C. Electrical

1. Demonstrate an understanding of Ohm's Law. HP-I

~~1.~~2. Check for available voltage, voltage drop and current, and resistance in electrical wiring circuits and components with a DMM (digital multimeter). HP-I

~~HP-I~~

~~2.~~3. Repair wiring and connectors. HP-G

~~3.~~4. Inspect, test, and replace fusible links, circuit breakers, and fuses. HP-I

~~4.~~5. Perform battery state-of-charge test and slow/fast battery charge. HP-I

~~5.~~6. Inspect, clean, repair or replace battery, battery cables, connectors and clamps. HP-I

~~6.~~7. Dispose ~~of~~/recycle batteries ~~and battery acid~~ according to local, state, and federal requirements. HP-G

~~7.~~8. Identify programmable electrical/electronic components and check for malfunction indicator lamp (MIL) and fault codes; record data for reprogramming before disconnecting battery. HP-I

~~8.~~9. Inspect alignment, adjust, remove and replace alternator (generator), drive belts, pulleys, and fans. HP-I

~~9.~~10. Check operation and aim headlamp assemblies and fog/driving lamps; determine needed repairs. ~~HP-I~~ HP-G

~~10.~~11. Inspect, test, and repair or replace switches, relays, bulbs, sockets, connectors, and ground wires of interior and exterior light circuits. HP-I

~~11.~~12. Remove and replace horn(s); check operation. HP-I

~~12.~~13. Check operation of wiper/washer systems; determine needed repairs. HP-I

~~13.~~14. Check operation of power side and tailgate window; determine needed repairs. HP-I

15. Check operation of motorized sliding doors, lift gates, tailgates, running boards, etc.; determine needed repairs. HP-G

~~14.~~16. Inspect, remove and replace power seat, motors, linkages, cables, etc. HP-G

~~15.~~17. Inspect, remove and replace components of electric door and hatch/trunk lock. HP-G

~~16.~~18. Inspect, remove and replace components of keyless lock/unlock devices and alarm systems. HP-G

~~17.~~19. Inspect, remove and replace components of electrical sunroof and convertible/retractable hard top. HP-G

~~18.~~20. Check operation of electrically heated mirrors, windshields, back lights, panels, etc.; determine needed repairs. HP-I

~~19.~~21. Demonstrate self-grounding procedures (anti-static) for handling electronic components. HP-I

~~20.~~22. Check for module communication errors using a scan tool. HP-G

~~21.~~23. Use wiring diagrams, component location, and diagnostic flow charts during diagnosis of electrical circuit problems. HP-G

~~22.~~24. Identify safe disabling techniques of high voltage systems on hybrid/electric vehicles. HP-G

~~23.~~25. Identify potential safety and materials handling concerns associated with high voltage hybrid/electric vehicle battery systems. HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

D. Brakes

1. Inspect brake lines, hoses, and fittings for damage or wear; tighten fittings and supports; replace brake lines (double flare and ISO types).	HP-G
2. Replace hoses, fittings, seals, and supports.	~~HP-I~~HP-G
3. Identify, handle, store, and fill with appropriate brake fluids.	HP-G
4. Bleed (manual, pressure, or vacuum) hydraulic brake system.	~~HP-I~~ HP-G
5. Pressure test brake hydraulic system; determine necessary action.	HP-G
6. Adjust brake shoes or pads; remove and reinstall brake drums or drum/hub assemblies.	~~HP-I~~ HP-G
7. Remove, clean and inspect caliper and rotor assembly and mountings for wear and damage; reinstall.	HP-I
8. Inspect parking brake system operation; repair or adjust as necessary; verify operation.	~~HP-I~~ HP-G
9. Identify the proper procedures for handling brake dust.	HP-G
10. Check for bent or damaged brake system components.	HP-G

11. Demonstrate an understanding of various types of advanced braking systems (ABS, electronic parking brake, hydraulic, electronic, traction and stability control). HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

E. Heating and Air Conditioning

1. Identify and comply with environmental regulations relating to refrigerants and coolants. HP-G

2. Maintain and verify correct operation of certified refrigerant recovery and recharging equipment. HP-G

3. Locate and identify A/C system service ports. HP-I

~~Identify type of refrigerant contamination in the system.,~~ HP-G

~~4.~~ ~~r~~Recover, label, and recycle refrigerant from an A/C system. HP-G

4. Recover, label and recycle refrigerant from an A/C system.~~Perform sealant test.~~ HP-G

~~HP-I~~

5. Select refrigerant, evacuate, and recharge A/C system. HP-G

~~HP-I~~

6. Select oil type and install correct amount in A/C system. HP-G

7. Inspect, adjust, and replace A/C compressor drive belts; check pulley alignment. HP-G

8. Remove and replace A/C compressor; inspect, repair or replace A/C compressor mount. HP-G

9. Inspect, repair or replace A/C system mufflers, hoses, lines, fittings, orifice tube, expansion valve, and seals. HP-G

10. Inspect, test, and replace A/C system condenser and mounts. HP-G

11. Inspect and replace receiver/drier or accumulator/drier. HP-G

12. Inspect and repair A/C component wiring. HP-G

13. Demonstrate an understanding of safe handling procedures associated with high voltage A/C compressors and wiring. HP-G

14. Inspect and protect open A/C system components from contaminants during repairs. HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

F. Cooling Systems

1. Check engine cooling and heater system hoses and belts; determine necessary action. HP-I

2. Inspect, test, remove, and replace radiator, pressure cap, coolant system components, and water pump. HP-G

3. Recover, refill, and bleed system with proper coolant and check level of protection; leak test system and dispose of materials in accordance with EPA regulations. HP-I

4. Remove, inspect and replace fan (both electrical and mechanical), fan sensors, fan pulley, fan clutch, and fan shroud; check operation. HP-G

5. Inspect, remove, and replace auxiliary oil/fluid coolers; check oil levels. HP-G

6. Demonstrate an understanding of hybrid/electric cooling systems. HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

G. Drive Train

1. Remove, replace, and adjust shift or clutch linkage as required. HP-G

2. Remove and replace electronic sensors, wires, and connectors. HP-G

3. Remove and reinstall powertrain assembly; inspect, replace, and align powertrain mounts. HP-G

4. Remove and replace drive axle assembly. HP-G

5. Inspect, remove and replace half shafts and axle constant velocity (CV) joints. HP-G

6. Inspect, remove and replace drive shafts and universal joints. HP-G

7. Demonstrate an understanding of safe handling procedures associated with high voltage powertrain components. HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

H. Fuel, Intake and Exhaust Systems

1. Inspect, remove and replace exhaust pipes, mufflers, converters, resonators, tail pipes, and heat shields. HP-G

2. Inspect, remove and replace fuel/DEF tank, tank filter, cap, filler hose, pump/sending unit and inertia switch; inspect and replace fuel lines and hoses. HP-G

3. Inspect, remove and replace engine components of air intake components. HP-G

4. Inspect, remove and replace canister, filter, vent, and purge lines of fuel vapor (EVAP) control systems. HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

I. Restraint Systems

1. Inspect, remove, and replace seatbelt and shoulder harness assembly and components. HP-G

2. Inspect restraint system mounting areas for damage; repair as needed. HP-G

3. Inspect the operation of the seatbelt system. HP-I

4. Disable and enable Supplemental Restraint System (SRS). HP-G

5. Inspect, protect, remove and replace Supplemental Restraint Systems (SRS) sensors and wiring; ensure sensor orientation. HP-G

6.	Verify that Supplemental Restraint System (SRS) is operational.	HP-I	
7.	Inspect, remove, replace and dispose of deployed and non-deployed airbag(s) and pretensioners.	HP-G	
8.	Use Diagnostic Trouble Codes (DTC) to diagnose and repair the Supplemental Restraint System (SRS).	HP-G	
9.	Demonstrate an understanding of advanced restraint and occupant classification systems (OCS).	HP-G	**ME Tasks** ~~34~~ HP-I 3137~~37~~ ~~81~~ HP-G 8373~~73~~
10.	Identify components of Supplemental Restraint Systems (SRS).	~~HP-G~~ HP-I	115 114~~110~~

PAINTING AND REFINISHING

For every task in Painting and Refinishing, the following safety requirements must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing and ~~the use of gloves; respiratory protection; eye protection;~~proper Personal Protection Equipment (PPE); 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. Identify vehicle system ~~hazard types~~precautions and/or inspections to include but not limited to ~~(~~Supplemental Restraint System (SRS) Inspection, Advanced Driver Assistance Systems (ADAS), hybrid/electric/alternative fuel vehicles~~)~~, locations and recommended procedures before inspecting or replacing components.

IV. PAINTING AND REFINISHING

A. ~~Restraint Systems~~Safety Precautions

~~1. Select and use proper personal safety equipment; take necessary precautions with hazardous operations and materials according to federal, state, and local regulations.~~ ~~HP-I~~

1. Select and use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (gloves, suits, hoods, eye and ear protection, etc.); take necessary precautions with hazardous operations and materials according to federal, state, and local regulations. HP-I

2. Identify safety and personal health hazards according to OSHA guidelines and the "Right to Know Law". HP-I

3. Inspect spray environment and equipment to ensure compliance with federal, state and local regulations, and for safety and cleanliness hazards. HP-I

~~4. Select and use a NIOSH approved air purifying respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation.~~ ~~HP-I~~

~~5.~~4. Select and use a NIOSH approved supplied air (Fresh Air Make-up) respirator system. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation HP-I

5. Perform vehicle clean-up; complete quality control using a checklist on operations performed. HP-I

~~6. Select and use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (gloves, suits, hoods, eye and ear protection, etc.).~~ ~~HP-I~~

IV. PAINTING AND REFINISHING

B. Surface Preparation

1. Inspect, remove, store, protect, and replace exterior trim and components necessary for proper surface preparation. HP-I

2. Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants. HP-I

3. Inspect and identify type of finish, surface condition, and film thickness; develop and document a plan for refinishing using a total product system. ~~HP-G~~ HP-I

4. Remove paint finish as needed. HP-I

5. ~~Dry or wet~~Properly sand areas to be refinished. HP-I

6. Identify and select appropriate sand-paper to ~~F~~featheredge areas to be refinished. HP-I

7. Apply suitable metal treatment or primer in accordance with total product systems. HP-I

8. Mask and protect other areas that will not be refinished. HP-I

9. Demonstrate different masking techniques (recess/back masking, foam door type, etc.).	~~HP-G~~ HP-I
10. Mix primer, primer-surfacer and primer-sealer following paint manufacturers technical data sheet instructions.~~.~~	HP-I
11. Identify a complimentary color or shade of undercoat to improve coverage.	HP-G
12. Apply primer onto surface of repaired area; demonstrating control of primer application by keeping the areas small as possible.	HP-I
13. Apply two-component finishing filler to minor surface imperfections.	HP-I
14. Guide coat and ~~B~~block sand area with correct grade/grit sandpaper to which primer-surfacer has been applied.	HP-I
15. Dry sand area to which two-component finishing filler has been applied.	HP-I
16. Remove dust from area to be refinished, including cracks or moldings of adjacent areas.	HP-I
17. Clean area to be refinished using a recommended final cleaning solution.	HP-I
18. Remove, with a tack rag, any dust or lint particles from the area to be refinished.	HP-I
19. Apply suitable primer sealer to the area being refinished.	HP-I
20. Scuff sand to remove nibs or imperfections from a sealer.	HP-I

21. Apply stone chip resistant coating. HP-G

22. ~~Identify chip resistant coatings and texture match techniques~~Restore caulking and seam sealers repaired areas and replacement panels as required. HP-G

23. ~~Identify caulking and seam sealers.~~Prepare adjacent panels for blending using paint manufacturers procedures. HP-~~G~~I

~~22.~~24. ~~Restore caulking and seam sealers to repaired areas.~~ Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials needed, preparation, and refinishing procedures. HP-~~G~~I

~~23.~~25. ~~Prepare adjacent panels for blending using paint manufactures recommended procedures.~~ Identify metal parts to be refinished; determine the materials needed, preparation, and refinishing procedures. HP-I

~~24.~~26. Identify chip resistant coatings and texture match. ~~the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials needed, preparation, and refinishing procedures.~~ HP-~~I~~G

~~25.~~27. Identify caulking and seam sealers that may need replacement. ~~metal parts to be refinished; determine the materials needed, preparation, and refinishing procedures.~~ HP-~~I~~G

28. Identify refinishing guidelines for stationary ~~fixed~~ glass flange ~~or stationary~~ areas to be refinished. HP-I

IV. PAINTING AND REFINISHING

C. Spray Gun and Related Equipment Operation

1. Inspect, clean, and determine condition of spray guns and related equipment (air hoses, regulators, air lines, air source, ~~and~~ spray environment, and fillers). HP-I

2. Select spray gun setup (fluid needle, nozzle, and cap) for product being applied. HP-I

3. Test and adjust spray gun using fluid, air and pattern control valves. HP-I

4. Demonstrate an understanding of the operation of pressure spray equipment. HP-G

IV. PAINTING AND REFINISHING

D. Paint Mixing, Matching, and Applying

1. Identify color code by manufacturer's vehicle information label. HP-I

2. Shake, stir, reduce, catalyze/activate, and strain refinish materials. HP-I

3. Apply finish using appropriate spray techniques (gun arc, angle, distance, travel speed, and spray pattern overlap) for the finish being applied. HP-I

4. Apply selected product on test or let-down panel; check for color match, properly store and maintain a color catalog. HP-I

5. ~~Apply~~ Understand the application of single stage topcoats. HP-G

6. Apply basecoat/clearcoat for panel blending, ~~and~~ panel refinishing and cut-in's. HP-I

7. Apply basecoat/clearcoat for overall refinishing. HP-G

8. Remove nibs or imperfections from basecoat. HP-I

~~HP-G~~

9. Identify product expiration dates as applicable. HP-I

10. Refinish plastic parts. HP-I

11. Apply multi-stage coats for panel blending and overall refinishing. HP-G

12. Identify and mix paint using a formula. HP-I

13. Identify poor hiding colors; determine necessary action. HP-G

~~HP-I~~

14. Tint color using formula to achieve a blendable match. HP-G

15. Identify alternative color formula to achieve a blendable match. HP-I

16. Identify the materials, equipment, and preparation differences between solvent and waterborne technologies. HP-G

IV. PAINTING AND REFINISHING

E. Paint Defects - Causes and Cures

1. Identify blistering (raising of the paint surface, air entrapment); correct the cause(s) and the condition. HP-G

2. Identify a dry spray appearance in the paint surface; correct the cause(s) and the condition. HP-I

3. Identify the presence of fish-eyes (crater-like openings) in the finish; correct the cause(s) and the condition. HP-I

4. Identify lifting; correct the cause(s) and the condition. HP-G

5. Identify clouding (mottling and streaking in metallic finishes); correct the cause(s) and the condition. HP-I

6. Identify orange peel; correct the cause(s) and the condition. HP-I

7. Identify overspray; correct the cause(s) and the condition. HP-I

8. Identify solvent popping in freshly painted surface; correct the cause(s) and the condition. HP-G

9. Identify sags and runs in paint surface; correct the cause(s) and the condition. HP-I

10. Identify sanding marks or sandscratch swelling; correct the cause(s) and the condition. HP-I

11. Identify contour mapping/edge mapping; correct the cause(s) and the condition. HP-G

12. Identify color difference (off-shade); correct the cause(s) and the condition. HP-G

13. Identify tape tracking; correct the cause(s) and the condition. HP-G

14. Identify low gloss condition; correct the cause(s) and the condition. HP-G

15. Identify poor adhesion; correct the cause(s) and the condition. HP-G

16. Identify paint cracking (shrinking, splitting, crowsfeet or line-checking, micro-checking, etc.); correct the cause(s) and the condition. HP-G

17. Identify corrosion; correct the cause(s) and the condition. HP-G

18. Identify dirt or dust in the paint surface; correct the cause(s) and the condition. HP-I

19. Identify water spotting; correct the cause(s) and the condition. HP-G

20. Identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition. HP-G

21. Identify finish damage caused by airborne contaminants (acids, soot, rail dust, and other industrial-related causes); correct the condition. HP-G

22. Identify die-back conditions (dulling of the paint film showing haziness); correct the cause(s) and the condition. HP-G

23. Identify chalking (oxidation); correct the cause(s) and the condition. HP-G

24. Identify bleed-through (staining); correct the cause(s) and the condition. HP-G

25. Identify pin-holing; correct the cause(s) and the condition. HP-G

26. Identify buffing-related imperfections (swirl marks, wheel burns); correct the condition. HP-I

27. Identify pigment flotation (color change through film build); correct the cause(s) and the condition. HP-G

IV. PAINTING AND REFINISHING

F. Final Detail

1. Apply decals, transfers, tapes, stone guards, moldings, and emblems~~woodgrains, pinstripes (painted and taped)~~, etc.	HP-G	
2. Sand, buff and polish fresh finish ~~or existing finish~~ to remove defects and texture as required.	HP-I	
3. Sand, buff and polish existing finish to recondition defects as required, match existing finish.	HP-I	
~~3.~~4. Clean interior, exterior, and glass.	HP-I	
~~4.~~5. Clean body openings (door jambs, gaps, and edges, etc.).	HP-I	
~~5.~~6. Remove overspray.	HP-I	**PR Tasks** HP-I 5753~~53~~ HP-G ~~30~~3131~~31~~
~~6.~~7. Perform vehicle clean-up; complete quality control using a checklist. ~~on operations performed.~~	HP-I	~~87~~ 88~~84~~
8. Measure and record film thickness before and after buffing.		
9. Perform nib sanding to remove small imperfections as required. HP-I	HP-I	

DAMAGE ANALYSIS, ESTIMATING AND CUSTOMER SERVICE

For every task in Damage Analysis, Estimating and Customer Service the following safety requirements must be strictly enforced:

Comply with personal and environmental safety practices associated with ~~clothing and the use of gloves; respiratory protection; eye protection~~proper Personal Protection Equipment (PPE); 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. Identify vehicle system ~~hazard types~~ (precautions and/or inspections to include but not limited to: Supplemental Restraint System (SRS) Inspection, Advanced Driver Assistance Systems (ADAS), hybrid/electric/alternative fuel vehicles~~)~~, locations and recommended procedures before inspecting or replacing components.

V. DAMAGE ANALYSIS, ESTIMATING, AND CUSTOMER SERVICE

A. Safety Precautions

1. Select and use proper personal safety equipment; take necessary precautions with hazardous operations and materials in accordance with federal, state, and local regulations. HP-I

2. Locate OEM procedures to identify material and composition of the vehicle being repaired (mild steel, high strength steel, ultra-high strength steel, aluminum, etc.). HP-I

~~2.~~3. Locate procedures and precautions that may apply to the vehicle being repaired. HP-I

~~3.~~4. Identify vehicle system ~~hazard types~~precautions and/or inspections to include but not limited to ~~(~~supplemental restraint system (SRS), advanced drive assistance systems (ADAS), hybrid/electric/alternative fuel vehicles~~)~~, locations and recommended procedures before inspecting or replacing components. HP-I

5. Perform vehicle clean-up; complete quality control using a checklist on operations performed. HP-I

~~4. Select and use a NIOSH approved air purifying respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA regulation 1910.134 and applicable state and local regulation.~~ ~~HP-I~~

V. DAMAGE ANALYSIS, ESTIMATING, AND CUSTOMER SERVICE

B. Damage Analysis

1. Position the vehicle for inspection under proper lighting; take photos to identify the vehicle and document damage.. ~~HP-G~~ HP-I

2. ~~Prepare vehicle for inspection by providing~~Identify components to be removed to gain access to damaged areas. HP-G ~~HP-I~~

3. Analyze damage to determine appropriate methods for overall repairs. HP-G

4. Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage. HP-G

5. Gather details of the incident/accident necessary to determine the full extent of vehicle damage. HP-G ~~HP-I~~

6. Identify and record pre-existing damage. HP-G

7. Identify and record prior repairs. HP-G

8. Perform visual inspection of structural components.	HP-G
9. Identify structural damage using measuring tools and equipment.	HP-I
10. Perform visual inspection of non-structural components.	HP-I
11. Determine parts, components, material type(s) and procedures necessary for a proper repair.	HP-I
12. Identify type and condition of finish; determine ~~if refinishing is~~refinish labor operations as required.	HP-I
13. Identify suspension, electrical, and mechanical component physical damage.	HP-G
14. Identify safety systems physical damage.	HP-G
	~~HP-I~~
15. Identify interior component damage.	HP-G
16. Identify ~~damage to~~ add-on accessories and modifications.	HP-G
17. Identify single (one time) use components.	HP-G
18. Identify and document illuminated dash malfunction indicator lamp(s) (MIL).	HP-I
19. Perform a pre-repair inspection of the vehicle with the customer. Record fit and finish concerns (color mismatch, factory gaps, unrelated prior damage and prior repairs).	HP-G

V. DAMAGE ANALYSIS, ESTIMATING, AND CUSTOMER SERVICE

C. Estimating

1. Determine and record customer/vehicle owner information. HP-I

2. Identify and record vehicle identification number (VIN) information, including nation of origin, make, model, restraint system, body type, production date, engine type, build data, and assembly plant. HP-I

3. Identify and record vehicle mileage and options, including trim level, paint code, transmission, accessories, and modifications. HP-I

4. Identify safety systems; determine precautions, inspections and replacement items as required. HP-G

5. Apply appropriate estimating and parts nomenclature (terminology). HP-I

6. Determine and apply appropriate estimating sequence. HP-I

7. Utilize estimating ~~guide~~ procedure pages. HP-I

8. Apply estimating ~~guide~~ footnotes, ~~and~~ headnotes, and line notes as needed. HP-I

9. Identify operations requiring labor value judgment. HP-G

10. Select appropriate labor code ~~value~~ for each operation (structural, non-structural, mechanical, and refinish). HP-I

11. Select and price ~~the different part options, including~~ - OEM parts, optional OEM parts, aftermarket parts, recycleable/used parts, remanufactured, rebuilt, and reconditioned parts; verify ~~aftermarket, recyclable/used parts~~ availability, compatibility, and condition. HP-G

~~12. Select and price alternative/optional OEM parts; verify availability, compatibility and condition.~~ ~~HP-G~~

~~13. Select and price aftermarket parts; verify availability, compatibility, and condition.~~ ~~HP-G~~

~~14. Select and price recyclable/used parts; verify availability, compatibility and condition.~~ ~~HP-G~~

~~15. Select and price remanufactured, rebuilt, and reconditioned parts; verify availability, compatibility and condition.~~ ~~HP-G~~

~~16.~~12. ~~Determine price and source of necessary~~Determine necessary sublet operations. HP-G

~~17.~~13. Determine ~~labor value, prices, charges, allowances, or fees for non-included~~included and non-included operations and miscellaneous items. HP-G

~~18.~~14. Recognize and apply overlap deductions., ~~included operations, and additions~~. HP-I

~~19.~~15. Determine additional material and charges. HP-G

~~20.~~16. Determine refinishing material and charges. HP-I

~~21.~~17. Apply math skills to establish charges and totals. HP-I

~~22.~~18. Identify ~~procedural~~ differences between computer generated and manually written estimates. HP-G

~~23.~~19. Identify procedures to restore corrosion protection; establish labor values, and material charges. HP-G

~~Review damage report and analyze damage to determine appropriate repair~~. HP-?

~~24.~~20. ~~Determine~~ Recognize the cost effectiveness of the repair and determine the approximate vehicle retail, and repair value. HP-G

~~25.~~21. Recognize the differences in ~~estimation procedures~~estimating platforms when using different information provider systems. HP-G

~~26.~~22. Verify accuracy of estimate compared to the actual repair and replacement operations. HP-G

23. Determine telematic/connectivity of the vehicle and place vehicle in service mode. HP-G

24. Identify vehicle safety recalls using the vehicle identification number (VIN).

25. Review damage report and analyze damage to determine appropriate methods for overall repair; communicate with team members to verify accuracy and resolve discrepancies. HP-I HP-G

V. DAMAGE ANALYSIS, ESTIMATING, AND CUSTOMER SERVICE

D. Vehicle Construction and Parts Identification

1. Identify type of vehicle construction (~~space frame,~~ unibody, body-over-frame). HP-G

2. Recognize the different collision damage ~~characteristics of space frame,~~between unibody~~,~~ and body-over-frame vehicles. HP-G

3. Identify impact energy absorbing components. HP-G

4. Identify ~~steel types;~~ different types of substrates (steel types, aluminum, magnesium, plastic, composites, etc.); determine repairability. HP-G

~~5. Identify aluminum/magnesium components; determine repairability.~~ ~~HP-G~~

~~6. Identify plastic/composite components; determine repairability.~~ ~~HP-G~~

~~7.~~5. Identify vehicle glass components and repair/replacement procedures. HP-G

~~8.~~6. Identify add-on accessories. HP-G

V. DAMAGE ANALYSIS, ESTIMATING, AND CUSTOMER SERVICE

E. Customer Relations and Sales Skills

1. Introduce yourself, ~~A~~acknowledge and~~/or~~ greet customer/client/visitor; offer assistance. HP-I

2. Listen to customer/client; collect information and identify customers/client's concerns, needs and expectations. HP-I

3. Establish cooperative attitude with customer/client. HP-I

~~4. Identify yourself to customer/client; offer assistance.~~ ~~HP-I~~

~~5.~~4. Deal with ~~angry~~ dissatisfied customer/client; seek resolution. HP-I

~~6.~~5. Identify customer/client preferred communication method; follow up to keep customer/client informed about parts and the repair process. HP-G

~~7.~~6.Recognize basic claims handling procedures; explain to customer/client.	HP-G	
~~8.~~7.Project positive attitude and professional appearance.	HP-I	
	~~HP-I~~	
~~9.~~8.Provide and review warranty information.	HP-G	
~~10.~~9. Provide and review technical and consumer protection information.	HP-G	
~~11.~~10. Estimate and explain duration of out-of-service time.	HP-G	
~~12.~~11. Demonstrate negotiation skills to obtain a mutual agreement.	HP-G	
~~13.~~12. Interpret and explain ~~manual or computer-assisted~~ estimate to customer/client.	HP-I	

DAECS Tasks	
HP-I	28~~30~~
HP-G	~~38~~39
	~~66~~ 67~~68~~

WELDING, CUTTING, AND JOINING

For every task in Welding, Cutting and Joining the following safety requirements must be strictly enforced:

Comply with personal and environmental safety practices associated with clothing and the use of ~~gloves; respiratory protection; eye protection~~proper Personal Protection Equipment (PPE); 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. Identify vehicle system ~~hazard types~~precautions and/or inspections including but not limited to ~~(~~Supplemental Restraint System (SRS) Inspection, Advanced Drive Assistance Systems (ADAS), hybrid/electric/alternative fuel vehicles~~)~~, locations and recommended procedures before inspecting or replacing components.

VI. WELDING, CUTTING, AND JOINING

A. Safety Precautions

1. Select and use proper personal safety equipment; take necessary precautions with hazardous operations and materials in accordance with federal, state, and local regulations. HP-I

2. Locate OEM procedures to identify materials and composition of the vehicle being repaired (mild steel, high strength steel, ultra-high strength steel, aluminum, etc.). HP-I

~~2.~~3. Locate procedures and precautions that may apply to the vehicle being repaired. HP-I

~~3.~~4. Identify vehicle system ~~hazard types~~precautions and/or inspections to include but not limited to ~~(~~supplemental restraint system (SRS), advanced driver assistance systems (ADAS), hybrid/electric/alternative fuel vehicles), locations and recommended procedures before inspecting or replacing components. HP-I

5. Perform vehicle clean-up; complete quality control using a checklist on operations performed. HP-I

~~4. Select and use a NIOSH approved air purifying respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA regulation 1910.134 and applicable state and local regulation. HP-I~~

VI. WELDING, CUTTING, AND JOINING

B. Metal Welding, Cutting, and Joining

1. Identify the considerations for cutting, removing, and welding various types of steel, aluminum, and other metals. HP-G

2. Determine the correct GMAW welder type, electrode/wire type, diameter, and gas to be used in a specific welding situation. HP-I

3. Set up, attach work clamp (ground), and adjust the GMAW welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the substrate being welded. HP-I

4. Store, handle, and install high-pressure gas cylinders; test for leaks. HP-I

5. Determine the proper angle of the gun to the joint and direction of gun travel for the type of weld being made. ~~HP-G~~ HP-I

6. Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations. ~~HP-I~~ HP-G

7. Identify hazards; foam coatings and flammable materials prior to welding/cutting procedures. HP-G

8. Protect computers and other electronics/wires ~~during~~ prior to welding procedures. ~~HP-I~~ HP-G

9. Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, clamp or tack as required. HP-I

10. Determine the joint type (butt weld with backing, lap, etc.) for weld being made. HP-I

11. Determine the type of weld (continuous, stitch weld, plug, etc.) for each specific welding operation. HP-I

12. Perform the following welds: plug, butt weld with and without backing, and fillet etc., in the flat, horizontal, vertical, and overhead positions. HP-I

13. Perform visual evaluation and destructive test on each weld type. HP-I

14. Identify the causes of various welding defects; make necessary adjustments. HP-I

15. Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments. HP-I

16. Identify cutting process for different substrates and locations; perform cutting operation. HP-I

17. Identify different methods of attaching structural components (squeeze type resistance spot welding (STRSW), riveting, structural adhesive, MIG bronze, rivet bonding, weld bonding, etc.). HP-G

Welding Tasks	
HP-I	16~~17~~
HP-G	5 ~~4~~
	21

Workplace Employability Skills

Personal Standards (see Standard 7.9)

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 ~~appropriate~~ personal hygiene appropriate to 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 7.10)

1. Complies with workplace policies/laws.

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 initiatives.

6. Follows directions.

7. Communicates (written and verbal) effectively 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.

~~12.~~13. Respectful of tools and property used in school and the workplace environment.

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 collision repair & refinish 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 four Collision Repair & Refinish Accreditation task categories. 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 by Area*, the program need only have those tools for the areas being accredited.

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 technician to provide his/her own basic hand tool set.

HAND TOOLS

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

Adjustable Wrenches – 6" and 12"		Slip Joint (Water Pump)	
Allen (Wrench or Socket) Set – Standard (.050"-3/8")		Snap Ring Plier Set - internal and external	
Allen (Wrench or Socket) Set – Metric (2mm - 7mm)		Punch Set	
Chisel Set		Screwdriver - Blade Type:	
Combination Wrenches:		Stubby	
Standard (1/4" - 1") (optional)		6", 9", 12"	
Metric (7mm - ~~19~~24mm)		Offset	
Crowfoot Wrench Set – Metric (optional)		Screwdrivers - Phillips:	
Crowfoot Wrench Set – Standard (optional)		Stubby #1, #2	
Drill ~~Motors~~ – 3/8" and 1/2" variable speed, reversible		6" #1, #2	
Flare Nut (tubing) Wrenches:		12" #3	
Standard 3/8" – 3/4" (optional)		Offset #2	
Metric 10mm – 17mm		~~Screwdrivers - Posidrive Set #1, #2, #3, #4~~	
Flashlight and batteries		Torx® Set:	
Hack Saw and blades		T8, T10, T15, T20, T25, T27, T30, T40, T50, T55	
Hammers:		Torx® External Set:	
16 oz. Ball Peen		E8, E10, E15, E20, E27, E30, E40, E45, E50, E55	
Brass		Screw Extractor Set	
Dead Blow Mallet		Screw Starter:	
Plastic Tip		Phillips	
Sledge		Standard	
Soft Faced		Socket Set - 1/4" Drive:	
Rubber Mallet		1/4" - 1/2" Standard Depth (optional)	
~~Ignition Wrench Set – Standard (optional) and Metric~~		1/4" - 1/2" Deep (optional)	
Impact Wrenches – 3/8" and 1/2"		6mm - 12mm Standard Depth ~~(optional)~~	
Inspection Mirror		6mm - 12mm Deep	
Pickup Tool – Magnetic and Claw type		Flex/Universal Type - Metric (standard optional)	
Pliers:		Universal Joint	
Combination		3", 6" Extensions	
Hose Clamp		Ratchet	
Locking Jaw			
Needle Nose			
Side Cutting			

Socket Set - 3/8" Drive:	
5/16" - 3/4" Standard Depth (6 point) (optional)	
3/8" - 3/4" Deep (6 point) (optional)	
9mm - 19mm Standard Depth ~~(optional)~~	
9mm - 19mm Deep	
3", 6", 12", 18" Extensions	
Flexhead Ratchet	
Impact Sockets - 3/8" - 3/4" Standard (optional)	
Impact Sockets - 10mm - 19mm	
~~Impact Driver~~	
Ratchet	
Universal Joint	
Socket Set - 1/2" Drive:	
7/16" - 1 1/8" Standard Depth (optional)	
7/16" - 1 1/8" Deep (optional)	
10mm - 25mm Standard Depth ~~(optional)~~	
10mm - 25mm Deep	
5", 10" Extensions	
Flex Handle (Breaker Bar)	
Impact Sockets Standard 7/16" - 1 1/8" (optional)	
Impact Sockets 12mm - 32mm	
~~Impact Driver~~	
Ratchet	
Torque Wrenches (Sound/Click) Type:	
3/8" Drive in. lb. (30 - 250)	
3/8" Drive ft. lb. (5 - 75)	
1/2" Drive ft. lb. (50 - 250)	

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 of these general tools and equipment readily available, in proper working order, and in sufficient quantity to provide quality instruction.

Air Blow Guns - OSHA Standard		Sponges	
Air System - Air Compressor		Step Ladder	
Air Hoses - with quick release couplings		Storage Cabinets	
Air Lines		Towels	
Regulator		Trash Cans in accordance with local, state, and federal regulations	
Water Extractors		Trouble/Work Lights – non-incandescent	
Air Transformer/Regulators		Wet/Dry Shop Vac~~Vacuum Cleaner~~	
~~Aluminum Dust Extraction System – Wet Mix Technology (Optional) Water Hose~~		Water Hose	
Chamois (synthetic)		Water Hose Nozzle	
Coolant Drain Pan		Work Benches – steel top with vice	
Corrosion Protection Application Equipment		Work Stands - portable	
Creepers		Wheel Caster System (Wheel Dollies)	
~~Exhaust Fans~~			
Grounded Extension Cords			
Heat Lamp			
Hood Props			
Infrared Non-Contact Thermometer			
Jack Stands			
~~Nozzle~~			
Oil Drain/Storage Pan			
Overhead Ventilation - for welding area			
Part Cart			
~~Powered Vehicle Mover (recommended)~~			
Pressure Washer (optional)			
~~Shammies~~			
Service Jacks			
Shop Brooms			
Dust Pans			
Floor Squeegee			
Floor Mop and Bucket			

SPECIAL SAFETY ITEMS

(All equipment must meet or exceed federal, state, and local regulations.)

Bloodborne Pathogen Kit	
***Ear Protection - for students, instructors, and visitors	
Eye Wash Basin	
Eye Wash Station, portable (saline)	
Fire Extinguishers - by type as required	
First Aid Kit (per written first aid policy)	
Flammable Material Storage Locker – meeting fire and building codes	
Hazardous Spill Response Kit	
Hybrid/Electric Vehicle Safety Kit (optional)	
Lineman Gloves (for use with hybrid vehicles)	
OSHA "Right to Know" Compliance Kit	
Protective Gloves and Clothing - for handling paint and related chemicals	
Respiratory Protection Equipment – as required by OSHA	
Safety Cans - for solvents, rags, etc.	
***Safety Glasses, Clear and Tinted Face Shields, and Goggles - for students, instructors, and visitors	
***Safety Shoes - as required	
Safety Shower - as required	
Vacuum System - for air sanders – dust extraction vacuum – stand alone or central system (recommended)	

*** = Individual Student Items**

MISCELLANEOUS TOOLS

Caulking Gun		Tin Snips	
C-clamps – assorted		Tire Pressure Gauge	
~~Drill with applicable bits for spot weld removal (carbide)~~		Tire Inflator	
~~Files - for steel and aluminum~~		Twist Drill Sets:	
~~Gear Puller Set – heavy duty with attachments~~		Standard - 1/64" - 1/4" by 1/16" and Metric Equivalent	
Heat Gun		Standard - 1/4" - 1/2" by 1/16" and Metric Equivalent	
Hole Saw Set – 1/2" to 2"		Wire Brushes - hand and powered	
~~Lug Wrench~~		Special Removing and Releasing Tools:	
Oil Can (Pump Type)		Door handle removing tool	
Panel Splitter (hand held blades/accessories)		~~Door hinge spring and pin remover~~	
Pry Bar Set		Miscellaneous interior and exterior trim removing tools	
Putty Knife		Moulding removal tools	
Rivet Guns - heavy duty blind and large for 3/16" and 1/4"		Spring lock line removal tool set (A/C, fuel line, etc.)	
Sanding Tools - assorted		Stationary glass removal tools (optional)	
Scrapers		Windshield wiper removing tool	
Scratch Awl			
Tap and Die Sets - Metric (standard optional)			
Tape Measure – Standard and Metric			

BODY WORKING TOOLS

Assorted files - for metal and plastic finishing, including:		Shrinking	
Body Files		Dollies:	
Hand Sanding Pads		Bumping File	
Metal Files		Dinging Spoon	
Mixing Board		Door skin Dolly	
Sanding Blocks (short and long)		Fender Dolly	
Sanding Boards (short and long)		Inside Heavy Duty Spoon	
Body Hammers:		Inside High Crown	
Cross Chisel		Inside Medium Crown	
Door Skin Hammer		Spoon Dolly (“Dolly on a stick”)	
General Purpose Pick		Toe Dolly	
Large Face Finishing		Universal Dolly	
Long Pick		Filler Spreaders and Applicators – assorted types and sizes	
Short Utility Pick		Picks – assorted	

ALUMINUM REPAIR TOOLS (RECOMMENDED)

Abrasives	
~~Belt~~Self-~~-~~Piercing Rivet Guns	
Dedicated (Clean) Repair Station	
Dent Pulling Equipment	
Dollies	
GMAW Welder Synergic Pulse	
Hammers	
Wet or dry ~~Mix Technology~~ Dust Extraction System approved for aluminum	
Body Files	
Stainless Steel Wire Brush	
~~Die~~ Dye-Penetrant~~in~~	

SPECIALTY TOOLS AND EQUIPMENT

FOR EACH ACCREDITATION AREA

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.

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.

PAINTING AND REFINISHING

Air Amplifier/Venturi Style Blower used to dry waterborne paint (optional)		Paint Shaker	
Air Cap Test Gauge (optional)		Paint Storage Room/Locker in accordance with local, state, and federal regulations	
Color-matching Light System		Personal Safety Equipment (painting gloves, suits, hoods, respirators, etc.)	
Electronic Dry Film Thickness Gauge with a + or - of 1/10th of a mil thickness capabilities (ferrous/non-ferrous)		Portable Paint Curing Equipment (infrared)	
Enclosed Paint Spray Booth to comply with local, state and federal regulation (downdraft booth recommended)		Positive Pressure Air Respirator	
Gun Washer for Waterbase (Optional)		Power Sanders	
Hand Sanding Pads		Prep Station - (recommended) in accordance with local, state, and federal regulations	
Masking Equipment -		Sanding Blocks (short and long)	
Car Covers		Spray Guns - HVLP (high volume low pressure) or compliant with high air flow fittings	
Paper and Tape Dispenser		Spray gun cleaning equipment or disposal liner cup system in accordance with local, state, and federal regulations	
Wheel Covers		UV Curing Light (optional)	
Paint Mixing Bank with Measuring Equipment		Variable Speed Buffer/Polisher	
Paint Mixing Room (~~separate explosion-proof room per NFPA regulations~~in accordance with local, state, and federal regulations)		Viscosity Cups	

Ultrasonic film thickness gauge - plastic (optional)		Waste disposal/recycle program in accordance with local, state, and federal regulations	
~~Disposable Cup Liner System~~		Waterborne Spray Gun Equipment (Optional)	
Paint Stand (Assorted)			

NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

Abrasive Cut-off Tool and Discs		~~Pulling and Holding Equipment Set - to include:~~	
Anchoring System (recommended)		~~Body Clamps (recommended)~~	
Car Lift (capable of totally lifting the vehicle) (recommended)		~~Cable or Chain Ratchet (recommended)~~	
GMAW Welders and accessories (flow meter, cart, gas cylinder, nozzle cleaner) 180M minimum (recommended)		~~Carbide Bits~~	
Heat Shrinking Tool		Panel Splitter	
Plasma Cutting Torch (recommended)		~~Safety Chains/Cables~~	
Portable Hydraulic Ram - with attachments		~~Sill Clamps (recommended)~~	
Plastic and Adhesives Tools -		Slide Hammer - complete with attachments	
Plastic Welder		Stationary Power Tools -	
Die Grinding Tool Set		Bench Grinder	
Disc Grinder - 3"		Drill Press (recommended)	
Structural Adhesives Guns (dispenser) - two-component		Welding Safety Equipment - to include:	
Portable Power Tools -		Aprons	
Abrasive Blaster and appropriate personal safety equipment (recommended)		Face Shields	
Eraser Wheel		Gloves	
Grinders		Goggles	
~~Heat Monitoring Crayons~~		Helmets	
Hole Punch		Jackets	
Metal Shears (optional)		Respirators	
Mini Belt Sander for Removal of Plug Welds		Safety Glasses	
Nibbler (optional)		Skull Cap	
Power Reciprocating Saw and Blades		Welding Blanket	
Sanders		Welding Pliers	
Spot Weld Removal Tool (optional)		And all appropriate safety equipment	
		Squeeze-type Resistant Spot Welder (STRSW) (9,000 amp/344 deca newton inverter technology) (recommended)	
		Weld-on Pulling Tool and Attachments	
		Glue Holed Equipment (optional)	

STRUCTURAL ANALYSIS AND DAMAGE REPAIR

Everything listed under Non-Structural Analysis and Damage Repair (Body Components) plus:

Frame/Unibody Straightening Equipment – Bench/rack ~~or floor-mounted~~ system with multiple pull capacity	
Body over frame and unibody anchoring systems	
Three-dimensional Measuring System with the capability to measure the total vehicle	
Tram Gauges	
Pulling and Holding Equipment Set:	
Body Clamps (recommended)	
Safety Chains/Cables	
Sill Clamps (recommended)	
Heat Monitoring Crayons	
Blind Rivet Tool 3/16” – 1/4” (3,822 lbf. minimum)	
GMAW (Pulse) Welder and accessories (flow meter, cart, gas cylinder and nozzle cleaner) 220 Volt 180 amps	

MECHANICAL AND ELECTRICAL COMPONENTS

A/C Recycle/Recovery Machine (optional)		Flexible Dial Indicator Gauge (optional)	
AGM Battery Charger compatible - with boost capability (~~recommended~~- Optional)		Jumper Wire Set (with various adapters)	
Battery Post Cleaner		Laptop with applicable Diagnostic Software & Tools or Scan Tool with OBDII capabilities	
Battery Terminal Pliers		Oil Filter Wrenches	
Battery Terminal Puller		Plugs and Caps for Hydraulic, Fluid and A/C Lines	
Brake Bleeder - vacuum assisted		Portable Battery Jump Box	
Brake Spoon		Pressure Bleeder/Scan Box for bleeding antilock braking system	
~~Chassis Lubricator~~		~~Scan Tool with OBDII capabilities~~	
Connector Pick Tool Set		Soldering Gun/Iron	
Coolant Tester		Vac and Fill Equipment to Extract Fluids (oil, transmission, etc.)	
Cooling System Pressure Tester		Wheel Alignment System (4-wheel) (optional)	
DMM (Digital Multimeter)		Wire and Terminal Repair Kit	
		~~Tamper Proof Torque Sets T8-T40~~- Torx ® Tamer Proof Set: T8, T10, T15, T20, T27, T30, T40	
~~Feeler Gauge (Blade Type):~~			
~~.002" - .040"~~			
~~.006mm - .070mm~~			

DEFINITIONS – TECHNICAL TERMS

1. ABRADE - (see SAND)

2. ACTIVE SUSPENSION SYSTEM - A continuously controlled self-adjusting suspension system.

3. ADJUST - To bring components or equipment to specified operational settings.

4. AIR PURIFYING RESPIRATOR - Uses a filter, cartridge, or canister to remove specific air contaminates by passing ambient air through the purifying element.

5. ALIGN (REALIGN) - To adjust components to a line or predetermined relative position.

6. ANALYZE - To examine the relationship of components of an operation.

7. ANCHOR - To hold in place.

8. APPLY - To put on, attach, or affix chemicals, components or parts by spraying, brushing, spreading or using hardware.

9. BLEED - To remove air from a closed system.

10. BUFF - To remove fine scratches, usually from a painted surface, using a fine abrasive such as compounds and polishes.

11. CHECK - (SEE VERIFY).

12. CLEAN - To rid component of extraneous matter for the purpose of reconditioning, repairing, measuring, or reassembling.

13. COLD SHRINK - To restore contour, shape, and dimensions to stretched sheet metal areas utilizing appropriate hammer and dolly techniques.

14. CONDITION - To prepare for future action.

15. DENIB - To remove dust/dirt particles in a painted surface.

16. DETERMINE - To establish the type and extent of damage to a component or the procedure to be used to affect the necessary repair.

17. DEVELOP (PLAN) - To identify, arrange or organize the steps or procedural components into a logical sequence of actions.

18. DIAGNOSE - To locate the root cause or nature of a problem by using a specified procedure.

19. EVACUATE - To remove air, fluid or vapor from a closed system by use of a vacuum pump.

20. FEATHEREDGE - To taper and smooth the edges of a damaged area using abrasives.

21. FILL (REFILL) - To bring fluid level to specified point or volume.

22. FLUSH - To use a fluid to clean an internal system.

23. GRIND - To remove material using a motor-driven abrasive wheel, disk or pad.

24. HEAT SHRINK - To restore contour, shape and dimensions to stretched sheet metal areas by applying heat and utilizing appropriate hammer and dolly techniques.

25. IDENTIFY - To establish the identity of a vehicle or component prior to service; to determine the nature or degree of a problem.

26. INSPECT (CHECK) - To verify condition by performing an operational or comparative examination.

27. INSTALL (REINSTALL) - To secure or attach a component in its proper position in a system.

28. LEAK TEST - To check for and/or locate leaks in a component or system.

29. LOCATE - To find by using tools, measuring instruments, equipment or the senses.

30. MASK - To protect a component or area from incidental damage from the application of refinishing materials.

31. MEASURE - To compare existing dimensions to specified dimensions by the use of calibrated instruments and gauges.

32. MIX - To combine or blend into one mass or mixture.

33. PERFORM - To accomplish a procedure in accordance with established methods and standards.

34. PLAN - (see DEVELOP)

35. PROTECT - To take actions to prevent damage to areas of the vehicles adjacent to the repair area.

36. REALIGN - (see ALIGN)

37. REDUCE - To lower the viscosity of a refinishing material.

38. REFILL - (see FILL)

39. REFINISH - To apply cleaners, paint, and other finishing materials to the repair areas.

40. REINSTALL - (see INSTALL)

41. REMOVE - To disconnect and separate a component from a system.

42. REPAIR (RESTORE) - To return damaged areas to acceptable size, dimensions, shape, performance characteristics and condition.

43. REPLACE - To exchange a damaged component with a new or used component.

44. RESTORE - (SEE REPAIR)

45. ROUGH SAND - To remove body filler, primer/substrate, or finish materials using coarse abrasives.

46. SAND (ABRADE) - To abrade or level the surface.

47. SCUFF - To abrade or degloss a surface for the purpose of adhesion.

48. SELECT - To choose the correct part, tool, equipment or setting during an assembly, adjustment or procedure.

49. SETUP - To select and assemble components, assemblies or parts in order or combination to produce desired results.

50. STORE - To organize and put away parts, hardware, and components for future retrieval and use.

51. STRAIGHTEN - To remove bends, creases, and other damage while returning a component to acceptable size, shape, and condition.

52. STRUCTURAL COMPONENTS - Any part of a vehicle's structure that bears loads, provides strength, and when removed or altered would compromise the integrity of the vehicle.

53. SUBSTRATE - A painted, primed or bare surface.

54. TINT - To adjust the color or hiding ability of refinishing materials.

55. VERIFY (CHECK) - To confirm a condition, adjustment or setting.

56. WASH - To clean by spraying, dipping, rinsing, rubbing or scrubbing.

57. WELD - To join metal or plastic pieces together by using a thermal process, often adding filler material to the joint.

2020 COLLISION REPAIR & REFINISH INSTRUCTOR QUALIFICATION SHEET

Instructor _____ **ASE ID# (required)** _____
(please print or type) (as it appears on ASE certificate)

New instructor with the program? ☐**No** ☐**Yes - Hire Date:**

Current ASE Certifications:	**Valid Until**
B-2 Painting & Refinishing	_____
B-3 Non-Structural Analysis & Damage Repair	_____
B-4 Structural Analysis & Damage Repair	_____
B-5 Mechanical & Electrical Components	_____

Please indicate the areas taught by this instructor:

Painting & Refinishing ☐

Non-Structural Analysis & Damage Repair (Body Components) ☐

Structural Analysis & Damage Repair ☐

Mechanical & Electrical ☐

COLLISION REPAIR & REFINISH MINIMUM REQUIREMENTS

1. The minimum program requirements are identical for initial accreditation and for renewal of accreditation.

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

Damage Analysis/Estimating/Customer Service (Required Area)

- **46 hours** combined classroom and lab-shop instructional activities

Painting & Refinishing

- **300 hours** combined classroom and lab-shop instructional activities

Non-Structural Analysis & Damage Repair

- **300 hours** combined classroom and lab-shop instructional activities
- **75 hours of Welding, Cutting & Joining is required**

Structural Analysis &Damage Repair (May only add if accrediting in Non-Structural)

- **185 hours** combined classroom and lab-shop instructional activities

Mechanical and Electrical Components

- **200 hours** combined classroom and lab-shop instructional activities

To achieve MASTER level of accreditation, programs are required to accredit in all areas.

3. **The average rating on each of Standards 6, 7, 8, 9 and 10 must be a four (4)** on a five-point scale. The program will not be approved for an on-site evaluation if the average is less than four (4) on any of those standards. The program should make improvements before submitting the application to the ASE Education Foundation for review. **A program will be denied accreditation if the on-site evaluation team average rating on Standards 6, 7, 8, 9 or 10 is less than four.**

4. A "YES" response must be achieved on all six (6) criteria in Standard 12 if the program is using it to meet the instructional hour requirements for the purpose of accreditation. The program will not be approved for an on-site evaluation if it cannot support a "YES" response to each criterion on the program evaluation form. A program will be denied accreditation if the on-site evaluation team does not give a "YES" response to all six (6) criteria in Standard 12. **This applies only to programs using the provisions in Standard 12 for the purpose of meeting instructional hour requirements.**

5. A program may not be approved for an on-site evaluation if the average rating on Standards 1- 5 and 11 is less than a four on a five-point scale. **A program may be denied accreditation if the on-site evaluation team average rating on Standards 1 - 5 and 11 is less than four.** Approval for on-site evaluation or accreditation will be made by the ASE Education Foundation, based on the number of standards rated at 4 or 5 as well as the individual rating on any standard rated less than four.

6. All instructors must hold current ASE certifications in the collision repair and refinish area(s) in which he/she teaches.

7. All instructors must attend a minimum of 20 hours per year of recognized industry update training relevant to the areas in which their program is accredited.

8. The program Advisory Committee, consisting of at least 5 members, must conduct at least two working meetings a year. Minutes of the meetings must be provided to the on-site evaluation team for review and must reflect relevant areas of the standards as having been considered by the Advisory Committee.

9. 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 type. Items on the Task List are broken down into two categories:

    - **High Priority - Individual (HP-I)** - is a task that requires students to demonstrate hands-on competency to the instructor on an individual (one-to-one) basis. Competency in HP-I tasks will indicate to employers that the graduate is skilled in that area. **ASE program accreditation requires 95% of the HP-I tasks to be included in the curriculum.**

    - **High Priority - Group (HP-G)** - is a task that can be taught through the use of video, demonstration, team training, etc. Students should be tested on the information presented, but is not required to demonstrate hands-on competency on an individual (one-to-one) basis. Competency in HP-G tasks will indicate to employers that the graduate has been tested on the information, but may not have “hands-on" competency skills. **ASE program accreditation requires 90% of the HP-G tasks to be included in the curriculum.**

10. A program that does not meet the minimum hour requirements may be eligible for accreditation if both of the following conditions are met for the areas of accreditation being sought:
    a. Show evidence that all graduates from the previous academic year have taken the professional level ASE certification examination, and

b. Show documentation that 75% of those graduates passed the professional level ASE certification tests. **NOTE:** The ASE Entry-Level test cannot be used to meet this requirement.

11. The concern for safety is paramount to the learning environment. Each program has the following safety requirement preceding all related tasks:

    Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; ear 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.

12. In 1998 the Occupational Safety and Health Administration (OSHA) issued a new rule on respiratory protection. The Occupational Safety and Health Standards, Title 29 Labor, Subpart I – Personal Protective Equipment requires employers to establish and maintain a respiratory protection program.

    Since the health and safety of students is a primary concern, all collision programs that seek ASE program accreditation must have their Program Administrator and Program Instructor sign the Application for Accreditation or Renewal of Accreditation, where indicated, that the school is aware of this rule (including respirator fit testing and filter changing) and to the extent required by law, is in compliance with the rule with respect to the students enrolled in the Collision Repair and Refinish Program.

13. **The ASE Education Foundation strongly encourages programs to review and comply with the Environmental Protection Agency (EPA) Design for the Environment (DfE) Project publications which can be accessed on the website at www.epa.gov/dfe/pubs/projects/auto.**

1. Best Practices for Auto Refinishers When Spray Painting
2. Best Practices for the Paint Mixing Room
3. Supplied-Air Respirators in Auto Shops: Get the Best Protection
4. User Friendly Supplied-Air Respirators: Options for Auto Refinishers
5. Choosing the Right Gloves for Painting Cars
6. Additionally, EPA issued a Final Rule on the National Emission Standards for Hazardous Air Pollutants NESHAP (Subpart HHHHHH) that the ASE Education Foundation recommends programs review: Paint Stripping and Miscellaneous Surface Coating Operations (found separately at http://www.epa.gov/ttn/atw/area/paint_stripb.pdf)

TASK LIST PRIORITY ITEM TOTALS (by area)

Structural Analysis and Damage Repair (SA)

HP-I = 1216 95% = 11 ~~15~~ Tasks

HP-G = 3027 90% = 27 ~~24~~ Tasks

Non-Structural Analysis and Damage Repair (NS)

HP-I = 3531 95% = 33 ~~29~~ Tasks

HP-G = 2420 90% = 21 ~~18~~ Tasks

Mechanical and Electrical Components (ME)

HP-I = 3437 95% = 32 ~~35~~ Tasks

HP-G = 8173 90% = 73 ~~66~~ Tasks

Painting and Refinishing (PR)

HP-I = 5753 95% = 54 ~~50~~ Tasks

HP-G = 3031 90% = 27 ~~28~~ Tasks

Damage Analysis, Estimating, Customer Service (DAECS)

HP-I = 2830 95% = 26 29 Tasks

HP-G = 38 90% = 34 Tasks

Welding, Cutting, and Joining

HP-I = 1617 95% = 15 16 Tasks

HP-G = 5 4 90% = 4 3 Tasks

ACCREDITATION OPTIONS

OPTION A

Painting and Refinishing, and Damage Analysis/Estimating/Customer Service (DAECS) (only)

Painting and Refinishing Tasks:	300 hours
DAECS tasks:	46 hours
Minimum Hour Requirement:	**346 hours**

OPTION B

*Non-Structural Analysis and Damage Repair, and Damage Analysis/Estimating/Customer Service (DAECS). MIG welding must be taught at some point during the course of study.

Non-Structural Analysis Tasks:	300 hours
MIG Welding	75 hours
DAECS tasks:	46 hours
Minimum Hour Requirement:	**421 hours**

OPTION C

*Structural Analysis and Damage Repair, Non-Structural Analysis and Damage Repair, and Damage Analysis/Estimating/Customer Service (DAECS). MIG welding must be taught at some point during the course of study.

Structural Analysis tasks:	185 hours
Non-Structural Analysis tasks:	300 hours
MIG Welding:	75 hours
DAECS tasks:	46 hours
Minimum Hour Requirement:	**606 hours**

Any of the following areas may be added to program accreditation OPTIONS A - C if not already included in the option selected:

*Non-Structural Analysis and Damage Repair (Body Components)

***Structural Analysis and Damage Repair (can only be added if accrediting in Non-Structural Analysis and Damage Repair)**

Mechanical and Electrical Components

Painting and Refinishing

OPTION D

***Master** accreditation requires a program to provide instruction in all of the collision repair and refinish areas, and must have a minimum of 1,106 hours of combined laboratory/shop (co-op) and classroom instruction. Tasks related to the four collision repair and refinish areas, the DAECS tasks and MIG welding may be taught at different times during the course of study. Therefore, the hours for an individual area would be the sum total of all the hours of instruction related to the tasks.

Master accreditation requires each area have the following minimum hours:

Painting and Refinishing	300 hours
Non-Structural Analysis and Damage Repair:	300 hours
Structural Analysis and Damage Repair:	185 hours
Mechanical and Electrical:	200 hours
MIG Welding:	75 hours
DAECS tasks:	46 hours
Minimum Hour Requirement:	**1,106**