

# 2023 ASE COLLISION REPAIR AND REFINISH UPDATED STANDARDS – SEPTEMBER 14, 2023 WEBINAR

## Summary of Changes

The ASE Education Foundation task list was reviewed and updated in February/March 2023. A national committee was assembled in Sterling, Virginia to review the tasks used in the collision repair and refinish accreditation program. The committee consisted of individuals representing vehicle manufacturers, collision repair and refinish shop owners and technicians, collision repair and refinish instructors and industry trainers, and collision repair and refinish equipment and parts suppliers.

**The most substantial change the workshop group approved was the creation of a new area of accreditation titled “Collision Repair and Refinish Fundamentals”.** It is intentionally limited in scope to allow students to focus on fundamental skills in collision-damaged vehicle disassembly, reassembly, sheet metal dent repair, plastic repair, and paint priming. Accreditation in Damage Analysis/Estimating/Customer Service is not required for programs accrediting in this area alone, as it is for all other programs. Likewise, Welding, Cutting, and Joining is not required for these programs, although they may always include additional instructional content that exceeds the minimum requirements of accreditation. The existing areas of accreditation continue to be offered alongside this new area.

The committee also updated the Workplace Employability Skills and moved all common safety tasks along with the addition of new hybrid/electric vehicle safety tasks to this section, renamed “Foundational Skills”. 100% of these skills are required to be taught by all accredited programs.

### **Collision Repair & Refinish Minimum Requirements**

- Minimum hour requirements were modified slightly for some accreditation areas. Damage Analysis/Estimating/Customer service was updated from 46 to 50 hours, and Structural Analysis & Damage Repair was changed from 185 to 175 hours. The minimum number of hours for the new Collision Repair and Refinish Fundamentals area was set at 300 total hours of classroom and lab-shop instructional activities.
- Instructors in programs accredited in Collision Repair & Refinish Fundamentals will be required to hold ASE Non-Structural Analysis & Damage Repair (B3) certification. In other programs, the requirement is unchanged: instructors must hold current ASE Collision Repair & Refinish certifications in the areas in which they teach.
- Minimum percentages of tasks that are required to be taught are being revised. High Priority – Individual (HP-I) task requirements change from 95% to 90% and High Priority – Group (HP-G) tasks requirements change from 90% to 85%.

**Foundational Skills** – Critical workplace skills are updated and added:

- *Complies with workplace policies/laws, including proper and responsible use of personal electronic devices.*
- *Contributes to an inclusive environment where every coworker and customer feels welcomed, heard, and valued.*

**Hybrid/Electric Vehicle Safety** – These tasks have been added and are required for all students in accredited Collision Repair & Refinish programs.

- *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.*
- *Demonstrate knowledge of high voltage system and component coloring, warning labels, lights, signage, and lock-out/tag-out procedures.*
- *Demonstrate ability to identify which components and circuits contain high voltage.*
- *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.*
- *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.*
- *Demonstrate knowledge of high voltage/electric vehicle intake process, inspection, handling, and in-process monitoring for collision-damaged vehicles*

**Two New Task Sections in Mechanical and Electrical Components** – New sections of tasks were added to address emerging technologies. Hybrid/electric vehicle service tasks are added here in addition to the global safety tasks listed above.

***Advanced Driver Assistance Systems***

- *Identify types of ADAS systems (such as speed control, collision avoidance, lane departure warning and assist, and camera systems) on the vehicle being repaired.*
- *Research operation of ADAS systems, sensors, and actuators, and static and/or dynamic recalibration procedures on the vehicle being repaired.*
- *Prepare vehicle and ensure service area is appropriate for static ADAS system recalibration.*
- *Perform static/dynamic ADAS recalibration procedures.*
- *Diagnose failed ADAS recalibrations, identify needed repairs.*

***Hybrid/Electric Vehicle Service***

- *Locate procedures for safe disabling and re-enabling of high voltage systems on hybrid/electric vehicles.*
- *Identify potential safety and materials handling concerns associated with high voltage hybrid/electric vehicle battery systems.*
- *Demonstrate knowledge of special multimeters, insulated tools, and other test equipment required for use in high voltage/electric vehicle circuits.*
- *Demonstrate knowledge of personal protective equipment (PPE) required for use in high voltage/electric vehicle circuits.*

- *Demonstrate knowledge of the use of a live-dead-live/zero potential test to verify isolation of the high voltage traction battery.*
- *Demonstrate knowledge of the testing and verification of ground circuit isolation between vehicle chassis ground and the high voltage circuits and components.*
- *Demonstrate an understanding of safe handling procedures associated with high voltage A/C compressors and wiring.*
- *Demonstrate an understanding of hybrid/electric cooling systems.*
- *Demonstrate an understanding of safe handling procedures associated with high voltage powertrain components.*
- *Demonstrate knowledge of recommendations/requirements for the storage of high voltage batteries removed from vehicles and replacement high voltage batteries.*

**Task List Priority Item Totals** have increased slightly. The new hybrid/electric vehicle safety tasks account for six of the increased number of tasks in each section.

	<u>2021</u> Required Minimum Totals	<u>2023</u> Required Minimum Totals
Damage Analysis, Estimating, Customer Service	79	84 (+5)
Painting & Refinishing	101	111 (+10)
Non-Structural Analysis & Damage Repair	73	83 (+10)
Welding, Cutting, & Joining	38	48 (+10)
Structural Analysis & Damage Repair	57	66 (+9)
Mechanical and Electrical Components	122	136 (+14)
Collision Repair and Refinish Fundamentals	n/a	121

Programs may begin submitting applications using the new standards July 1, 2023. Applications using the 2021 requirements will no longer be accepted after December 31, 2023.

## **SELECTED SECTIONS FROM 2023 ASE COLLISION REPAIR AND REFINISH UPDATED STANDARDS**

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

### **Damage Analysis/Estimating/Customer Service**

- **50 hours** combined classroom and lab-shop instructional activities
- **Required for all accredited programs except those accredited in Collision Repair and Refinish Fundamentals only.**

### **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 additional hours of Welding, Cutting & Joining is also required.**

### **Structural Analysis & Damage Repair**

- **175 hours** combined classroom and lab-shop instructional activities
- **Accreditation in Non-Structural Analysis & Damage Repair is also required.**

### **Mechanical and Electrical Components**

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

### **Collision Repair and Refinish Fundamentals**

- **300 hours** combined classroom and lab-shop instructional activities
- Damage Analysis/Estimating/Customer Service is **not** required for programs accrediting in this area alone.
- Welding, Cutting, & Joining is also not required for programs accrediting in this area alone, although programs may always include additional instructional content that exceeds the minimum requirements of accreditation.

To achieve MASTER level of accreditation, programs are required to accredit in all areas except Collision Repair and Refinish Fundamentals.

## **FOUNDATIONAL SKILLS**

**All Foundational Skills tasks are 100% required for all ASE accredited Collision Repair and Refinish programs, regardless of the area(s) of accreditation.**

### **Personal Standards (see Standard 7.7)**

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 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 7.8)**

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 initiatives.
6. Follows directions.
7. Communicates (written/electronic 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.
13. Respectful of tools and property used in school and the workplace environment.
14. Contributes to an inclusive environment where every coworker and customer feels welcomed, heard, and valued.

### **Workplace and Personal Safety**

1. Select and use proper personal safety equipment; take necessary precautions with hazardous operations and materials in accordance with federal, state, and local regulations.
2. Locate OEM procedures to identify material and composition of the vehicle being repaired (mild steel, high strength steel, ultra-high strength steel, aluminum, stationary glass, etc.)
3. Locate procedures and precautions that may apply to the vehicle being repaired, including materials used in the repair.
4. Identify vehicle system 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.
5. Perform vehicle clean-up; complete quality control using a checklist on operations performed.
6. Determine telematic/connectivity of the vehicle and recognize the need to place vehicle in service mode.

### **Hybrid/Electric Vehicle 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 collision-damaged vehicles.

## **COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**For every task in Collision Repair and Refinish Fundamentals, the following safety requirements must be strictly enforced:**

**Comply with personal and environmental safety practices associated with clothing and 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 Supplemental Restraint System (SRS) Inspection, Advanced Driver Assistance Systems (ADAS), hybrid/electric/alternative fuel vehicles, locations and recommended procedures before inspecting or replacing components.**

### **VI. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

#### **A. Damage Analysis and Estimating: Damage Analysis**

1. Identify components to be removed to gain access to damaged areas. HP-G
2. Analyze damage to determine appropriate repair methods in accordance with manufacturer's recommendations and guidelines. HP-G
3. Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage. HP-G
4. Perform visual inspection of non-structural components. HP-I
5. Determine parts, components, material type(s) and procedures necessary for a proper repair. HP-I

- 6. Identify suspension, electrical, and mechanical component physical damage. HP-G
- 7. Identify single (one time) use components. HP-G

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**B. Damage Analysis and Estimating: 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

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**C. Damage Analysis and Estimating: Vehicle Construction and Parts Identification**

- 1. Identify type of vehicle construction (unibody, body-over-frame). HP-G
- 2. Recognize the different collision damage between unibody and body-over-frame vehicles. HP-G
- 3. Identify impact energy absorbing components. HP-G
- 4. Identify different types and strengths of substrates (steel types, aluminum, magnesium, plastic, composites, etc.) HP-G
- 5. Identify vehicle glass components and repair/replacement procedures. HP-G
- 6. Identify add-on accessories. HP-G
- 7. Recognize different vehicle joining/attaching methods (e.g., welding, adhesives, rivets, etc.) HP-G

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**D. Refinishing: Safety Precautions and Regulations**

- 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

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| 2. Identify safety and personal health hazards according to OSHA guidelines, the “Right to Know Law”, and SDS information.  | 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 respiratory protection system (supplied air/fresh air make up recommended). Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulations. | HP-I |
| 5. Perform equipment and work area clean-up as per applicable federal, state, and local regulations.  | HP-I |
| 6. Demonstrate knowledge of the process for tracking of expelled VOCs.  | HP-G |
| 7. Follow federal, state, and local regulations regarding the handling and disposal of refinishing waste products.  | HP-G |

## **VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

### **E. Refinishing: Surface Preparation**

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| 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. Remove paint finish as needed.  | HP-I |
| 4. Properly sand areas to be refinished.   | HP-I |
| 5. Identify and select appropriate sandpaper to featheredge areas to be refinished.  | HP-I |
| 6. Apply suitable metal treatment or primer in accordance with total product systems.  | HP-I |
| 7. Mask and protect other areas that will not be refinished.   | HP-I |
| 8. Demonstrate different masking techniques (recess/back masking, foam door type, etc.).   | HP-I |
| 9. Mix primer, primer-surfacer following paint manufacturers technical data sheet instructions.  | HP-I |
| 10. Apply primer onto surface of repaired area, demonstrating control of primer application by keeping the areas as small as possible. | HP-I |
| 11. Force curing and drying of primer coating following paint manufacturers technical data sheet.                                      | HP-I |



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| 12. Apply two-component finishing filler to minor surface imperfections.   | HP-I |
| 13. Apply guide coat and block sand area with correct grade/grit sandpaper to which primer-surfacer has been applied.  | HP-I |
| 14. Dry sand area to which two-component finishing filler has been applied.  | HP-I |
| 15. Remove dust from area to be refinished, including cracks or moldings of adjacent areas.  | HP-I |
| 16. Clean area to be refinished using a recommended final cleaning solution.   | HP-I |
| 17. Prepare adjacent panels for blending using paint manufacturers procedures.   | HP-I |
| 18. Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials needed, preparation, and refinishing procedures. | HP-I |
| 19. Identify metal parts to be refinished; determine the materials needed, preparation, and refinishing procedures.  | HP-I |
| 20. Identify refinishing guidelines for stationary glass flange areas to be refinished.  | HP-I |

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**F. Refinishing: Spray Gun and Related Equipment Operation**

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| 1. Inspect, clean, and determine condition of spray guns and related equipment (air hoses, regulators, air lines, air source, spray environment, and filters). | 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 |

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**G. Non-Structural Repair: Preparation**

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| 1. Inspect, remove, protect, label, store, inventory, and reinstall exterior trim and moldings.   | HP-I |
| 2. Inspect, remove, protect, label, store, inventory, and reinstall interior trim and components.   | HP-I |
| 3. Inspect, remove, protect, label, store, inventory, and reinstall body panels and components that may interfere with or be damaged during repair.                   | HP-I |
| 4. Inspect, remove, protect, label, store, inventory, and reinstall vehicle mechanical and electrical components that may interfere with or be damaged during repair. | HP-I |
| 5. Protect panels, glass, interior parts, and other vehicles adjacent to the repair area.   | HP-I |

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| 6. Soap and water wash entire vehicle; complete pre-repair inspection checklist.                                      | HP-I |
| 7. Prepare damaged area using water-based and solvent-based cleaners.   | HP-I |
| 8. Remove corrosion protection, undercoating, sealers, and other protective coatings as necessary to perform repairs. | HP-I |
| 9. Inspect, remove, and reinstall repairable plastics and other components for off-vehicle repair.                    | HP-I |

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**H. Non-Structural Repair: Outer Body Panels**

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| 1. Inspect, remove, replace, and align hood, hood hinges, and hood latch.  | HP-I |
| 2. Inspect, remove, replace, and align deck lid, lid hinges, and lid latch.  | HP-I |
| 3. Inspect, remove, replace, and align doors, latches, hinges, and related hardware.   | HP-I |
| 4. Inspect, remove, replace, and align tailgates, hatches, and liftgates.  | HP-I |
| 5. Inspect, remove, replace, and align sliding doors.  | HP-G |
| 6. Inspect, remove, replace, overhaul, and align bumpers, covers, reinforcements, guards, impact absorbers, and mounting hardware. | HP-I |
| 7. Inspect, remove, replace, and align fenders and related panels.   | HP-I |
| 8. Restore corrosion protection during and after the repair.   | HP-I |
| 9. Replace seam sealer to match OEM appearance.  | HP-I |
| 10. Restore sound deadeners and foam materials.  | HP-G |
| 11. Identify one-time use fasteners.   | HP-I |
| 12. Inspect and identify labels/decals and replace as necessary.   | HP-G |
| 13. Follow manufacturers guidelines when applying heat to non-structural components during repair.                                 | HP-G |

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**I. Non-Structural Repair: Metal Finishing and Body Filling**

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| 1. Prepare a panel for body filler by abrading or removing the coatings; featheredge, 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. Shape body filler to contour; finish sand.  | HP-I |
| 9. Perform proper metal straightening techniques for aluminum.   | HP-G |
| 10. Perform proper application of body filler to aluminum.   | HP-G |
| 11. Locate and repair surface irregularities and straighten contours on a damaged panel using Glue-Pulling Dent Repair (GPDR).                                       | HP-G |
| 12. Mix and apply body filler.   | HP-I |

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**J. Non-Structural Repair: Moveable Glass and Hardware**

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| 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 |

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**K. Non-Structural Repair: Plastics, Adhesives, and Welding**

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| 1. Identify the types of plastics; determine repairability.  | HP-I |
| 2. Identify location of damage relative to safety systems (ADAS); determine repairability according to manufacturer repair procedures. | HP-G |

- 3. Clean and prepare the surface of plastic parts; identify the types of plastic repair procedures. HP-I
- 4. Repair rigid, semi-rigid, and flexible plastic panels. HP-I
- 5. Remove, replace, or repair damaged areas of rigid exterior composite panels. HP-G
- 6. Repair plastic parts by welding (nitrogen or airless). HP-I
- 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

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**L. Mechanical and Electrical Components: Suspension and Steering**

- 1. Reinstall wheels and tighten lug nuts to manufacturers spec using a torque wrench. HP-I

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**M. Mechanical and Electrical Components: Electrical**

**Note: all tasks in this section refer to low voltage systems and components only**

- 1. Remove, replace, and recharge battery. HP-I
- 2. Check operation and aim headlamp assemblies and fog/driving lamps. HP-G
- 3. Remove and replace horn(s); check operation. HP-I
- 4. Check operation of wiper/washer systems. HP-I

**VII. COLLISION REPAIR AND REFINISH FUNDAMENTALS**

**N. Mechanical and Electrical Components: Fuel, Intake and Exhaust Systems**

- 1. Remove, and replace air intake components. HP-G

**CF Tasks**

HP-I	71
HP-G	31
Total	102

## 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 - 24mm)		Offset	
Crowfoot Wrench Set – Metric (optional)		Screwdrivers - Phillips:	
Crowfoot Wrench Set – Standard (optional)		Stubby #1, #2	
Drills – 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		Torx® Set:	
Flashlight and batteries		T8, T10, T15, T20, T25, T27, T30, T40, T50, T55	
Hack Saw and blades		Torx® External Set:	
Hammers:		E8, E10, E15, E20, E27, E30, E40, E45, E50, E55	
16 oz. Ball Peen		Torx® Plus Set: TX	
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)	
Impact Wrenches – 3/8" and 1/2"		1/4" - 1/2" Deep (optional)	
Inspection Mirror		6mm - 12mm Standard Depth	
Pickup Tool – Magnetic and Claw type		6mm - 12mm Deep	
Pliers:		Flex/Universal Type - Metric (standard optional)	
Combination		Universal Joint	
Hose Clamp		3", 6" Extensions	
Locking Jaw		Ratchet	
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	
9mm - 19mm Deep	
M4 – M18 Triple Square	
3", 6", 12", 18" Extensions	
Flexhead Ratchet	
Impact Sockets - 3/8" - 3/4" Standard (optional)	
Impact Sockets - 10mm - 19mm	
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	
10mm - 25mm Deep	
5", 10" Extensions	
Flex Handle (Breaker Bar)	
Impact Sockets Standard 7/16" - 1 1/8" (optional)	
Impact Sockets 12mm - 32mm	
Ratchet	
Torque Wrenches (Sound/Click)Type:	
1/4" or 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		Work Benches – steel top with vice	
Air System - Air Compressor		Work Stands – portable	
Air Hoses - with quick release couplings		Wheel Caster System (Wheel Dollies)	
Air Lines			
Regulator			
Water Extractors			
Air Transformer/Regulators			
Chamois (synthetic)			
Coolant Drain Pan			
Corrosion Protection Application Equipment			
Creepers			
Grounded Extension Cords			
Heat Lamp (optional)			
Hood Props			
Infrared Non-Contact Thermometer			
Jack Stands			
Oil Drain/Storage Pan			
Overhead Ventilation - for welding area			
Part Cart			
Pressure Washer (optional)			
Service Jacks			
Shop Brooms			
Dust Pans			
Floor Squeegee			
Floor Mop and Bucket			
Sponges			
Step Ladder			
Storage Cabinets			
Towels			
Trash Cans in accordance with local, state, and federal regulations			
Trouble/Work Lights – non-incandescent			
Wet/Dry Shop Vac			
Water Hose			
Water Hose Nozzle			

## SPECIAL SAFETY ITEMS

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

Bloodborne Pathogen Kit		
*Hearing Protection - for students, instructors, and visitors		OSHA "Right to Know" Compliance Kit
Eye Wash Basin		Protective Gloves and Clothing - for handling paint and related chemicals
Eye Wash Station, portable (saline)		Respiratory Protection Equipment – as required by OSHA
Fire Extinguishers - by type as required		Safety Cans - for solvents, rags, etc.
First Aid Kit (per written first aid policy)		*Safety Glasses, Clear and Tinted Face Shields, and Goggles, with ANSI Z 87 rating - for students, instructors, and visitors
Flammable Material Storage Locker – meeting fire and building codes		*Safety Shoes - as required by state or local regulations
Hazardous Spill Response Kit		Safety Shower - as required by state or local regulations
		Vacuum System - for air sanders – dust extraction vacuum – stand alone or central system (recommended)
Cut-Proof Gloves		* = <b>Individual Student Items</b>

## MISCELLANEOUS TOOLS

Caulking Gun		Tin Snips
C-clamps – assorted		Tire Pressure Gauge
Heat Gun		Tire Inflator
Hole Saw Set – 1/2" to 2"		Twist Drill Sets:
		Standard - 1/64" - 1/4" by 1/16" and Metric Equivalent
Panel Splitter (hand held blades/accessories)		Standard - 1/4" - 1/2" by 1/16" and Metric Equivalent
Pry Bar Set		Wire Brushes - hand and powered
Putty Knife		Special Removing and Releasing Tools:
Rivet Guns - heavy duty blind and large for 3/16" and 1/4"		Door handle removing tool
Sanding Tools - assorted		Miscellaneous interior and exterior trim removing tools
Scrapers		Moulding removal tools



Scratch Awl		Spring lock line removal tool set (A/C, fuel line, etc.)	
Tap and Die Sets - Metric (standard optional)		Stationary glass removal tools (optional)	
Tape Measure – Standard and Metric		Windshield wiper removing tool	

### **BODY WORKING TOOLS**

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

### **ALUMINUM REPAIR TOOLS (RECOMMENDED)**

Abrasive tools		GMAW Welder Synergic Pulse	
Body Files		Hammers	
Dedicated (Clean) Repair Station		Self-Piercing Rivet Guns	
Dent Pulling Equipment		Stainless Steel Wire Brush	
Dollies		Wet Mix Technology Dust Extraction System approved for aluminum	
Dye Penetrant		Glue Pull System	

### **HYBRID/ELECTRIC VEHICLE TOOLS & EQUIPMENT (RECOMMENDED)**

Hybrid/Electric Vehicle Safety Kit		Insulated Retrieval Hook	
Electrical Insulating Gloves – must meet CAT 0 1000 VAC and 1500 VDC electrical safety		Insulation Tester/Multimeter and leads – must meet CAT III 600 volt, CAT III 1000 volt, or CAT IV 600 volt rating	

glove rating – may have expired certification if used for demonstration only			
EV charging equipment		Battery Lift Table	
Vehicle lift with weight and physical configuration appropriate for hybrid/electric vehicles		Leather Gloves to go over Electrical Insulating Gloves	

## **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.

### **COLLISION REPAIR AND REFINISH FUNDAMENTALS**

Computerized Estimating System (recommended)			
Air Amplifier/Venturi Style Blower used to dry waterborne paint (optional)		Paint Storage Room/Locker in accordance with local, state, and federal regulations	
Enclosed Paint Spray Booth or Spray Environment to comply with local, state and federal regulation (downdraft booth recommended)		Personal Safety Equipment (painting gloves, suits, hoods, and NIOSH-approved respiratory protection systems, respirators, etc.)	
Hand Sanding Pads		Portable Paint Curing Equipment (infrared)	
Masking Equipment -		Power Sanders	
Car Covers / Plastic Sheeting		Sanding Blocks (short and long)	
Paper and Tape Dispenser		Spray Guns - HVLP (high volume low pressure) or compliant with high air flow fittings	
Paint Mixing Room (in accordance with local, state, and federal regulations) (recommended)		Spray gun cleaning equipment or disposable liner cup system in accordance with local, state, and federal regulations	
Paint Shaker		Waste disposal/recycle program in accordance with local, state, and federal regulations	
Parts Stands (assorted)			
Glue Pull Equipment		Disc Grinder	
Heat Shrinking Tool		Structural Adhesives Guns (dispenser) - two-component	
Portable Hydraulic Ram - with attachments (optional)		Portable Power Tools -	
Plastic and Adhesives Tools -		Eraser Wheel	
Plastic Welder		Slide Hammer - complete with attachments	
Die Grinding Tool Set		Weld-on Pulling Tool and Attachments	
AGM Battery Charger/Booster		Battery Terminal Pliers	
Battery Post Cleaner		Battery Terminal Puller	