TASK LIST AND ASSUMPTIONS

The NATEF task list was reviewed and updated in March 2009. A national committee was assembled in Herndon, Virginia to review the standards 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.

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;
   * 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 manufacturers 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 recommended guidelines are not available, published industry guidelines are used;
   * 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 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.

DEFINITIONS – TECHNICAL TERMS

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

ADJUST – To bring components or equipment to specified operational settings.

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

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

ANALYZE – To examine the relationship of components of an operation.

ANCHOR – To hold in place.

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

BLEED – To remove air from a closed system.

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

CHECK – (SEE VERIFY).

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

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

CONDITION – To prepare for future action.

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

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

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

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

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

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

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

FLUSH – To use a fluid to clean an internal system.

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

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

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

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

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

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

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

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

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

MIX – To combine or blend into one mass or mixture.

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

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

REDUCE – To lower the viscosity of a refinishing material.

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

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

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

REPLACE – To exchange a damaged component with a new or used component.

RESTORE – (SEE REPAIR)

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

SAND – To abrade or level the surface.

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

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

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

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

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

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.

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

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

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

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

NATEF TASK LIST

STRUCTURAL ANALYSIS AND DAMAGE REPAIR

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

Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

A. Frame Inspection and Repair

1.	Measure and diagnose structural damage using a tram gauge.	HP-I
2.	Attach vehicle to anchoring devices.	HP-I
3.	Analyze, straighten and align mash (collapse) damage.	HP-G
4.	Analyze, straighten and align sag damage.	HP-G
5.	Analyze, straighten and align sidesway 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.	Restore corrosion protection to repaired or replaced frame areas.	HP-I
10.	Analyze and identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems.	HP-G
11.	Align or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and wheel alignment problems.	HP-G
12.	Identify heat limitations for structural components.	HP-I

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.	Measure and diagnose structural damage to vehicles using a dedicated (fixture) measuring system.	HP-G
16.	Determine the extent of the direct and indirect damage and the direction of impact; document the methods and sequence of repair.	HP-I
17.	Analyze and identify crush/collapse zones.	HP-I
18.	Restore mounting and anchoring locations.	HP-G

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

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

1.	Analyze and identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and chassis alignment problems.	HP-G
2.	Realign or replace misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering and chassis alignment problems.	HP-G
3.	Measure and diagnose unibody damage using tram gauge.	HP-I
4.	Determine and inspect the locations of all suspension, steering, and powertrain component attaching points on the vehicle.	HP-G
5.	Measure and diagnose unibody vehicles using a dedicated (fixture) measuring system.	HP-G
6.	Diagnose and measure unibody vehicles using a three-dimensional measuring system (mechanical, electronic, and laser, etc.).	HP-G
7.	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
8.	Attach anchoring devices to vehicle; remove or reposition components as necessary.	HP-I
9.	Straighten and align cowl assembly.	HP-G
10.	Straighten and align roof rails/headers and roof panels.	HP-G

11.	Straighten and align hinge and lock pillars.	HP-G
12.	Straighten and align vehicle openings, floor pans, and rocker panels.	HP-G
13.	Straighten and align quarter panels, wheelhouse assemblies, and rear body sections (including rails and suspension/powertrain mounting points).	HP-G
14.	Straighten and align front-end sections (aprons, strut towers, upper and lower rails, steering, and suspension/power train mounting points, etc.).	HP-G
15.	Identify substrate and repair or replacement recommendations.	HP-I
16.	Identify proper cold stress relief methods.	HP-I
17.	Repair damage using power tools and hand tools to restore proper contours and dimensions.	HP-I
18.	Remove and replace damaged sections of steel body structures.	HP-G
19.	Restore corrosion protection to repaired or replaced structural areas.	HP-I
20.	Determine the extent of damage to aluminum structural components; repair, weld, or replace.	HP-G
21.	Analyze and identify crush/collapse zones.	HP-I
22.	Restore mounting and anchoring locations.	HP-G

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

C. Fixed Glass

1.	Remove and reinstall or replace fixed glass (heated and non-heated) using recommended materials and techniques.	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

I. STRUCTURAL ANALYSIS AND DAMAGE REPAIR

D. Metal Welding and Cutting

1.	Identify weldable and non-weldable substrates used in vehicle construction.	HP-I

2.	Weld and cut high-strength steel and other steels.	HP-I
3.	Weld and cut aluminum.	HP-G
4.	Determine the correct GMAW (MIG) welder type, electrode/wire type, diameter, and gas to be used in a specific welding situation.	HP-I
5.	Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the substrate being welded.	HP-I
6.	Store, handle, and install high-pressure gas cylinders.	HP-I
7.	Determine work clamp (ground) location and attach.	HP-I
8.	Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.	HP-I
9.	Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.	HP-I
10.	Protect computers and other electronic control modules during welding procedures.	HP-I
11.	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
12.	Determine the joint type (butt weld with backing, lap, etc.) for weld being made.	HP-I
13.	Determine the type of weld (continuous, stitch weld, plug, etc.) for each specific welding operation.	HP-I
14.	Perform the following welds: continuous, plug, butt weld with and without backing, and fillet etc.	HP-I
15.	Perform visual and destructive tests on each weld type.	HP-I
16.	Identify the causes of various welding defects; make necessary adjustments.	HP-I
17.	Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.	HP-I
18.	Identify cutting process for different substrates and locations; perform cutting operation.	HP-I

19.	Identify different methods of attaching structural components (squeeze type resistance spot welding (STRSW), riveting, structural adhesive, silicon bronze, etc.).	HP-G

NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

For every task in Non-Structural Analysis and Damage Repair (Body Components), the following safety requirement 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; 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.

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

A. 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, store, and replace exterior trim and moldings.	HP-I
3.	Inspect, remove, store, and replace interior trim and components.	HP-I
4.	Inspect, remove, store, and replace body panels and components that may interfere with or be damaged during repair.	HP-I
5.	Inspect, remove, store, and replace 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 for inspection.	HP-I
8.	Prepare damaged area using water-based and solvent-based cleaners.	HP-I
9.	Remove corrosion protection, undercoatings, 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)

B. Outer Body Panel Repairs, Replacements, and Adjustments

1.	Determine the extent of direct (primary) and indirect (secondary) damage and direction of impact; develop and document a repair plan.	HP-I
2.	Inspect, remove and replace bolted, bonded, and 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, and align bumper bars, covers, reinforcement, guards, isolators, and mounting hardware.	HP-I
9.	Inspect, remove, replace and align fenders, and related panels.	HP-I
10.	Straighten contours of damaged panels to a suitable condition for body filling or metal finishing using power tools, hand tools, and weld-on pulling attachments.	HP-I
11.	Weld damaged or torn steel body panels; repair broken welds.	HP-G
12.	Restore corrosion protection.	HP-I
13.	Replace door skins.	HP-G
14.	Restore sound deadeners and foam materials.	HP-G
15.	Perform panel bonding.	HP-G
16.	Diagnose and repair water leaks, dust leaks, and wind noise.	HP-G
17.	Identify one-time use fasteners.	HP-G

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

C. Metal Finishing and Body Filling

1.	Remove paint from the damaged area of a body panel.	HP-I
2.	Locate and repair surface irregularities on a damaged body panel.	HP-I
3.	Demonstrate hammer and dolly techniques.	HP-I
4.	Heat shrink stretched panel areas to proper contour.	HP-I
5.	Cold shrink stretched panel areas to proper contour.	HP-I
6.	Mix and apply body filler.	HP-I
7.	Rough sand body filler to contour; finish sand.	HP-I
8.	Determine the proper metal finishing techniques for aluminum.	HP-G
9.	Determine proper application of body filler to aluminum.	HP-G

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

D. Moveable Glass and Hardware

1.	Inspect, adjust, 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, 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

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

E. Metal Welding and Cutting

1.	Identify weldable and non-weldable substrates used in vehicle construction.	HP-I
2.	Weld and cut high-strength steel and other steels.	HP-I
3.	Weld and cut aluminum.	HP-G

4.	Determine the correct GMAW (MIG) welder type, electrode/wire type, diameter, and gas to be used in a specific welding situation.	HP-I
5.	Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the substrate being welded.	HP-I
6.	Store, handle, and install high-pressure gas cylinders.	HP-I
7.	Determine work clamp (ground) location and attach.	HP-I
8.	Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.	HP-I
9.	Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.	HP-I
10.	Protect computers and other electronic control modules during welding procedures.	HP-I
11.	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
12.	Determine the joint type (butt weld with backing, lap, etc.) for weld being made.	HP-I
13.	Determine the type of weld (continuous, stitch weld, plug, etc.) for each specific welding operation.	HP-I
14.	Perform the following welds: continuous, plug, butt weld with and without backing, fillet, etc.	HP-I
15.	Perform visual and destructive tests on each weld type.	HP-I
16.	Identify the causes of various welding defects; make necessary adjustments.	HP-I
17.	Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.	HP-I
18.	Identify cutting process for different substrates and locations; perform cutting operation.	HP-I
19.	Identify different methods of attaching non-structural components (squeeze type resistant spot welds (STRSW), riveting, non-structural adhesive, silicon bronze, etc.).	HP-G

F. Plastics and Adhesives

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, or flexible plastic panels.	HP-I
4.	Remove or repair damaged areas from rigid exterior composite panels.	HP-G
5.	Replace bonded rigid exterior composite body panels; straighten or align panel supports.	HP-G

MECHANICAL AND ELECTRICAL COMPONENTS

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

Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

III. MECHANICAL AND ELECTRICAL COMPONENTS

A. Suspension and Steering

1.	Identify one–time use fasteners.	HP-I
2.	Clean, inspect, and prepare reusable fasteners.	HP-I
3.	Remove, replace, inspect or adjust power steering pump, pulleys, belts, hoses, fittings and pump mounts.	HP-G
4.	Remove and replace power steering gear (non-rack and pinion type).	HP-G
5.	Inspect, remove, and replace power rack and pinion steering gear and related components.	HP-G
6.	Inspect and replace parallelogram steering linkage components.	HP-G

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

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

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

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

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

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

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

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

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

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

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

18. Measure vehicle ride height; determine needed repairs. HP-I

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

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

21. Verify proper operation of steering system. HP-G

22. Diagnose front and rear suspension system noises and body sway problems; determine needed repairs. HP-G

23. Diagnose vehicle wandering, pulling, hard steering, bump steer, memory steering, torque steering, and steering return problems; determine needed repairs. HP-G

24.	Demonstrate an understanding of suspension and steering alignments (caster, camber, toe, SAI) etc..	HP-G
25.	Diagnose tire wear patterns; determine needed repairs.	HP-I
26.	Inspect tires; identify direction of rotation and location; check tire size, tire pressure monitoring system (TPM) and adjust air pressure.	HP-I
27.	Diagnose wheel/tire vibration, shimmy, tire pull (lead), wheel hop problems; determine needed repairs.	HP-G
28.	Measure wheel, tire, axle, and hub runout; determine needed repairs.	HP-I
29.	Reinstall wheels and torque lug nuts.	HP-I

III. MECHANICAL AND ELECTRICAL COMPONENTS

B. Electrical

1.	Check for available voltage, voltage drop and current in electrical wiring circuits and components with a DMM (digital multimeter).	HP-I
2.	Repair electrical circuits, wiring, and connectors.	HP-I
3.	Inspect, test, and replace fusible links, circuit breakers, and fuses.	HP-I
4.	Perform battery state-of-charge test and slow/fast battery charge..	HP-I
5.	Inspect, clean, repair or replace battery, battery cables, connectors and clamps.	HP-I
6.	Dispose of batteries and battery acid according to local, state, and federal requirements.	HP-G
7.	Identify programmable electrical/electronic components and check for malfunction indicator lamp (MIL); record data for reprogramming before disconnecting battery.	HP-I
8.	Inspect alignment, adjust, remove and replace alternator (generator), drive belts, pulleys, and fans.	HP-I
9.	Check operation and aim headlamp assemblies and fog/driving lamps; determine needed repairs.	HP-I
10.	Inspect, test, and repair or replace switches, relays, bulbs, sockets, connectors, and wires of interior and exterior light circuits.	HP-I

11.	Remove and replace horn(s); check operation.	HP-I
12.	Check operation of wiper/washer systems; determine needed repairs.	HP-I
13.	Check operation of power side and tailgate window; determine needed repairs.	HP-I
14.	Inspect, remove and replace power seat, motors, linkages, cables, etc.	HP-G
15.	Inspect, remove and replace components of electric door and hatch/trunk lock.	HP-G
16.	Inspect, remove and replace components of keyless lock/unlock devices and alarm systems.	HP-G
17.	Inspect, remove and replace components of electrical sunroof and convertible/retractable hard top.	HP-G
18.	Check operation of electrically heated mirrors, windshields, back lights, panels, etc.; determine needed repairs.	HP-I
19.	Demonstrate the proper self-grounding procedures for handling electronic components.	HP-I
20.	Check for module communication errors using a scan tool.	HP-G
21.	Use wiring diagrams and diagnostic flow charts during diagnosis of electrical circuit problems.	HP-G
22.	Demonstrate safe disarming techniques of high voltage systems on hybrid vehicles.	HP-G
23.	Identify potential safety and environmental concerns associated with hybrid vehicle systems.	HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

C. Brakes

1.	Inspect brake lines, hoses, and fittings for leaks, dents, kinks, rust, cracks or wear; tighten fittings and supports; replace brake lines (double flare and ISO types), hoses, fittings, seals, and supports.	HP-I
2.	Identify, handle, store, and install appropriate brake fluids; dispose of in accordance with federal, state, and local regulations.	HP-G
3.	Bleed (manual, pressure, vacuum or surge) hydraulic brake system.	HP-I

4.	Pressure test brake hydraulic system; determine needed repair.	HP-G
5.	Adjust brake shoes; remove and reinstall brake drums or drum/hub assemblies and wheel bearings.	HP-I
6.	Remove, clean and inspect caliper assembly and mountings for wear and damage; reinstall.	HP-I
7.	Check parking brake system operation.	HP-I
8.	Identify the proper procedures for handling brake dust.	HP-G
9.	Check for bent or damaged brake system components.	HP-G
10.	Demonstrate an understanding of various types of advanced braking systems (ABS, hydraulic, electronic, traction control).	HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

D. Heating and Air Conditioning

1.	Identify and comply with environmental concerns 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
4.	Identify, recover, label and store refrigerant from A/C system.	HP-G
5.	Recycle refrigerant in accordance with EPA regulations.	HP-G
6.	Evacuate and recharge A/C system; check for leaks.	HP-I
7.	Identify oil type and maintain correct amount in A/C system.	HP-G
8.	Inspect, adjust, and replace A/C compressor drive belts; check pulley alignment.	HP-G
9.	Remove and replace A/C compressor; inspect, repair or replace A/C compressor mount.	HP-G
10.	Inspect, repair or replace A/C system mufflers, hoses, lines, fittings, orifice tube, expansion valve, and seals.	HP-G
11.	Inspect, test, and replace A/C system condenser and mounts.	HP-G

12.	Inspect and replace receiver/drier or accumulator/drier.	HP-G
13.	Inspect and repair A/C component wiring.	HP-G
14.	Demonstrate an understanding of safe handling procedures associated with high voltage A/C compressors and wiring.	HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

E. Cooling Systems

1.	Check engine cooling and heater system hoses and belts; determine needed repairs.	HP-I
2.	Inspect, test, remove, and replace radiator, pressure cap, coolant recovery system, 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 specifications.	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 cooling systems.	HP-G

III. MECHANICAL AND ELECTRICAL COMPONENTS

F. Drive Train

1.	Remove, replace, and adjust shift or clutch linkage as required.	HP-G
2.	Remove, replace, and adjust cables or linkages for throttle valve (TV), kickdown, and accelerator pedal.	HP-G
3.	Remove and replace electronic sensors, wires, and connectors.	HP-G
4.	Remove and replace powertrain assembly; inspect, replace, and align powertrain mounts.	HP-G
5.	Remove and replace drive axle assembly.	HP-G
6.	Inspect, remove and replace half shafts and axle constant velocity (CV) joints.	HP-G

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

III. MECHANICAL AND ELECTRICAL COMPONENTS

G. 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 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 systems.	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

H. Restraint Systems

1.	Identify vehicle manufacturer's SRS recommended procedures before inspecting or replacing components.	HP-I
2.	Inspect, remove, and replace seatbelt and shoulder harness assembly and components.	HP-G
3.	Inspect restraint system mounting areas for damage; repair as needed.	HP-G
4.	Verify proper operation of seatbelt.	HP-I
5.	Deactivate and reactivate Supplemental Restraint System (SRS).	HP-G
6.	Inspect, remove and replace Supplemental Restraint Systems (SRS) sensors and wiring; ensure sensor orientation.	HP-G
7.	Verify that Supplemental Restraint System (SRS) is operational.	HP-I
8.	Inspect, remove, replace and dispose of deployed and non-deployed airbag(s) and pretensioners.	HP-G
9.	Use Diagnostic Trouble Codes (DTC) to diagnose and repair the Supplemental Restraint System (SRS).	HP-G
10.	Demonstrate an understanding of advanced restraint systems.	HP-G

PAINTING AND REFINISHING

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

Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

IV. PAINTING AND REFINISHING

A. Safety Precautions

1.	Identify and 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.	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
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

B. Surface Preparation

1.	Inspect, remove, store, 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 substrate, type of finish, surface condition, and film thickness; develop and document a plan for refinishing using a total product system.	HP-I
4.	Strip paint to bare substrate (paint removal).	HP-I
5.	Dry or wet sand areas to be refinished.	HP-I
6.	Featheredge damaged 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.	Mix primer, primer-surfacer or primer-sealer.	HP-I
10.	Apply primer onto surface of repaired area.	HP-I
11.	Apply two-component finishing filler to minor surface imperfections.	HP-I
12.	Dry or wet sand area to which primer-surfacer has been applied.	HP-I
13.	Dry sand area to which two-component finishing filler has been applied.	HP-I
14.	Remove dust from area to be refinished, including cracks or moldings of adjacent areas.	HP-I
15.	Clean area to be refinished using a final cleaning solution.	HP-I
16.	Remove, with a tack rag, any dust or lint particles from the area to be refinished.	HP-I
17.	Apply suitable sealer to the area being refinished.	HP-I
18.	Scuff sand to remove nibs or imperfections from a sealer.	HP-I
19.	Apply stone chip resistant coating.	HP-G
20.	Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas.	HP-G
21.	Prepare adjacent panels for blending.	HP-I
22.	Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures.	HP-I

23.	Identify aluminum parts to be refinished; determine the materials, preparation, and refinishing procedures.	HP-G

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).	HP-I
2.	Check and adjust spray gun operation for HVLP (high volume, low pressure) or compliant spray guns.	HP-I
3.	Set-up (fluid needle, nozzle, and cap), 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 type and 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, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.	HP-I
4.	Apply selected product on test and let-down panel; check for color match.	HP-I
5.	Apply single stage topcoat.	HP-I
6.	Apply basecoat/clearcoat for panel blending or panel refinishing.	HP-I
7.	Apply basecoat/clearcoat for overall refinishing.	HP-G
8.	Remove nibs or imperfections from basecoat.	HP-I
9.	Refinish rigid or semi-rigid, and plastic parts.	HP-G
10.	Refinish flexible plastic parts.	HP-I
11.	Apply multi-stage coats for panel blending or overall refinishing.	HP-G
12.	Identify and mix paint using a formula.	HP-I
13.	Identify poor hiding colors; determine necessary action.	HP-G

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

IV. PAINTING AND REFINISHING

E. Paint Defects - Causes and Cures

1.	Identify blistering (raising of the paint surface, air entrapment); determine the cause(s) and correct the condition.	HP-G
2.	Identify blushing (milky or hazy formation); determine the cause(s) and correct the condition.	HP-G
3.	Identify a dry spray appearance in the paint surface; determine the cause(s) and correct the condition.	HP-G
4.	Identify the presence of fish-eyes (crater-like openings) in the finish; determine the cause(s) and correct the condition.	HP-I
5.	Identify lifting; determine the cause(s) and correct the condition.	HP-G
6.	Identify clouding (mottling and streaking in metallic finishes); determine the cause(s) and correct the condition.	HP-I
7.	Identify orange peel; determine the cause(s) and correct the condition.	HP-I
8.	Identify overspray; determine the cause(s) and correct the condition.	HP-I
9.	Identify solvent popping in freshly painted surface; determine the cause(s) and correct the condition.	HP-G
10.	Identify sags and runs in paint surface; determine the cause(s) and correct the condition.	HP-I
11.	Identify sanding marks or sandscratch swelling; determine the cause(s) and correct the condition.	HP-G
12.	Identify contour mapping/edge mapping while finish is drying; determine the cause(s) and correct the condition.	HP-G
13.	Identify color difference (off-shade); determine the cause(s) and correct the condition.	HP-G
14.	Identify tape tracking; determine the cause(s) and correct the condition.	HP-G

15.	Identify low gloss condition; determine the cause(s) and correct the condition.	HP-G
16.	Identify poor adhesion; determine the cause(s) and correct the condition.	HP-G
17.	Identify paint cracking (shrinking, splitting, crowsfeet or line-checking, micro-checking, etc.); determine the cause(s) and correct the condition.	HP-G
18.	Identify corrosion; determine the cause(s) and correct the condition.	HP-G
19.	Identify dirt or dust in the paint surface; determine the cause(s) and correct the condition.	HP-I
20.	Identify water spotting; determine the cause(s) and correct the condition.	HP-G
21.	Identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition.	HP-G
22.	Identify finish damage caused by airborne contaminants (acids, soot, rail dust, and other industrial-related causes); correct the condition.	HP-G
23.	Identify die-back conditions (dulling of the paint film showing haziness); determine the cause(s) and correct the condition.	HP-G
24.	Identify chalking (oxidation); determine the cause(s) and correct the condition.	HP-G
25.	Identify bleed-through (staining); determine the cause(s) and correct the condition.	HP-G
26.	Identify pin-holing; determine the cause(s) and correct the condition.	HP-G
27.	Identify buffing-related imperfections (swirl marks, wheel burns); correct the condition.	HP-I
28.	Identify pigment flotation (color change through film build); determine the cause(s) and correct the condition.	HP-G

IV. PAINTING AND REFINISHING

F. Final Detail

1.	Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc.	HP-G
2.	Buff and polish finish to remove defects as required.	HP-I
3.	Clean interior, exterior, and glass.	HP-I

4.	Clean body openings (door jambs and edges, etc.).	HP-I
5.	Remove overspray.	HP-I
6.	Perform pre-delivery detail and inspection.	HP-I

Task List Priority Item Totals (by area)

I. Structural Analysis and Damage Repair

HP-I	= 31 (includes 17 welding)	*95% = 29 tasks*
HP-G	= 31 (includes 2 welding)	*90% = 28 tasks*

II. Non-Structural Analysis and Damage Repair (Body Components)

HP-I	= 45 (includes 17 welding)	*95% = 43 tasks*
HP-G	= 19 (includes 2 welding)	*90% = 17 tasks*

III. Mechanical and Electrical Components

HP-I	= 33	*95% = 31 tasks*
HP-G	= 70	*90% = 63 tasks*

IV. Painting and Refinishing

HP-I	= 52	*95% = 49 tasks*
HP-G	= 30	*90% = 27 tasks*