2016
Collision Repair and Refinish Standards

Summary of Changes

4/14/2016

Summary of Changes

1. Minimum Requirements

Option A

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

OR

Option B

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

Additional Areas that can be added to:

Option A
- Non-Structural Analysis
- Structural Analysis - Only if Non-Structural is added
- Mechanical & Electrical

Option B
- Painting & Refinishing
- Structural Analysis
- Mechanical & Electrical

2. Instructor Qualifications

There were no changes to instructor qualifications.

3. Task List and Assumptions

There were no changes to this area.

4. Task List Changes – only those tasks that were changed, added or removed are included in this document.

The following statement has been added to the opening statement for each area of accreditation:

Identify vehicle system hazard types (Supplemental Restraint System (SRS), hybrid/electric/alternative fuel vehicles), locations and recommended procedures before inspecting or replacing components.

The following tasks have been added as item **A. Safety Precautions** for all areas of accreditation except Painting & Refinishing which has safety precautions specific to this area.

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 procedures and precautions that may apply to the vehicle being repaired. HP-I

3. Identify vehicle system hazard types (supplemental restraint system (SRS), hybrid/electric/alternative fuel vehicles), locations and recommended procedures before inspecting or replacing components. 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. Frame Inspection and Repair

2. Attach vehicle to anchoring devices. HP-GI

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

9. Replace protective coatings, restore corrosion protection to repaired or replaced frame areas and anchoring locations.~~Restore corrosion protection to repaired or replaced frame areas.~~ ~~HP-I~~HP-G

10. Analyze and identify misaligned or damaged steering, suspension, and powertrain ~~components that can cause vibration, steering, and wheel alignment problems~~mounting points. HP-G

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

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

15. ~~Measure and diagnose structural damage to vehicles using a dedicated (fixture) measuring system.~~ ~~HP-G~~

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

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

2. A~~Rea~~lign or replace misaligned or damaged steering, suspension, and powertrain mounting points~~components~~ that can cause vibration, steering and chassis alignment problems. HP-G

~~4. Determine and inspect the locations of all suspension, steering, and powertrain component attaching points on the vehicle.~~ ~~HP-G~~

~~9. Straighten and align cowl assembly.~~ ~~HP-G~~

9. Straighten and align ~~hinge and lock pillars~~rocker panels and pillars. HP-G

10. Straighten and align vehicle openings, and floor pans~~, and rocker panels~~. HP-G

16. ~~Remove and replace damaged sections of steel body structures~~Determine sectioning procedures of a steel body structure. ~~HP-G~~HP-I

17. Remove and replace damaged structural components. ~~HP-G~~

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

~~22. Restore mounting and anchoring locations.~~ ~~HP-G~~

D. ~~C.~~ Stationary~~Fixed~~ Glass

1. ~~Remove and reinstall or replace fixed glass (heated and non-heated) using recommended materials and techniques~~Identify considerations for removal, handling, and installation of advanced glass systems (rain sensors, navigation, cameras, collision avoidance systems). HP-G

All welding, cutting and joining tasks that were previously in Structural Analysis and Non-Structural Analysis have been moved to a new section titled Welding, Cutting and Joining.

I. 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 procedures and precautions that may apply to the vehicle being repaired. HP-I

3. Identify vehicle system hazard types (supplemental restraint system (SRS), hybrid/electric/alternative fuel vehicles), locations and recommended procedures before inspecting or replacing components. 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. WELDING, CUTTING AND JOINING

B. Metal ~~Metal~~ Welding, ~~and~~ Cutting, and Joining

1. Identify ~~weldable and non-weldable substrates used in vehicle construction~~the considerations for cutting, removing, and welding various types of steel, aluminum, and other metals. HP-GI

~~2. Weld and cut high-strength steel and other steels.~~ ~~HP-I~~
~~3. Weld and cut aluminum.~~

2. Determine the correct GMAW ~~(MIG)~~ 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 ~~(MIG)~~ 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~~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-GI

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

~~7. Determine work clamp (ground) location and attach.~~ ~~HP-I~~

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

8. Protect computers and other electronics/wires ~~control modules~~ during welding procedures. HP-I

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: ~~continuous,~~ 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~~s~~ 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~~silicon~~ bronze, etc.). HP-G

III. ~~H.~~ NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

B.~~A.~~ Preparation

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

III. ~~H.~~ NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)

C. ~~B.~~ Outer Body Panel Repairs, Replacements, and Adjustments

1. ~~Determine the extent of~~Inspect/locate direct~~, and~~ indirect, or ~~/~~hidden damage and direction of impact~~; develop and document a repair plan~~. HP-I

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

8. Inspect, remove, replace, and align bumpers~~ bars~~, covers, reinforcements, guards, impact absorbers~~isolators~~, and mounting hardware. 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~~

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

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

D. ~~C.~~ Metal Finishing and Body Filling

1. ~~Remove paint from the damaged area of a body panel.~~Prepare a panel for body filler by abrading or removing the coatings; featheredge and refine scratches before the application of body filler. HP-I

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

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

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

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

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

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

11. 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

F. Plastics and Adhesives

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

IV. ~~III.~~ MECHANICAL AND ELECTRICAL COMPONENTS

B. ~~A.~~ Suspension and Steering

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

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

19. Measure vehicle ride height and wheel base; determine ~~needed repairs~~necessary action. HP-I

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~~needed repairs~~. HP-G

24. Diagnose vehicle wandering, pulling, hard steering, bump steer, memory steering, torque steering, and steering return problems; determine ~~needed repairs~~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 ~~needed repairs~~cause. HP-I

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

C. ~~B.~~ Electrical

2. Repair ~~electrical circuits,~~ wiring~~,~~ and connectors. HP-I

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

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

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

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

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

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

D. ~~C.~~ Brakes

1. Inspect brake lines, hoses, and fittings for ~~leaks, dents, kinks, rust, cracks~~damage or wear; tighten fittings and supports; replace brake lines (double flare and ISO types)~~, hoses, fittings, seals, and supports~~. HP-G~~I~~

2. Replace hoses, fittings, seals, and supports. HP-I

3. Identify, handle, store, and ~~install~~ fill with appropriate brake fluids~~; dispose of in accordance with federal, state, and local regulations~~. HP-G

5. Pressure test brake hydraulic system; determine ~~needed repair~~necessary action. HP-G

6. Adjust brake shoes or pads; remove and reinstall brake drums or drum/hub assemblies ~~and wheel bearings~~. HP-I

8. ~~Check~~ Inspect parking brake system operation; repair or adjust as necessary; verify operation. HP-I

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

E. ~~D.~~ Heating and Air Conditioning

4. Identify refrigerant contamination, recover, label, ~~and~~ store, and recycle refrigerant from an A/C system. HP-G

~~5. Recycle refrigerant in accordance with EPA regulations. HP-G~~

5. Select refrigerant, e~~E~~vacuate, and recharge an A/C system; check for leaks. HP-I

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

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

F. ~~E.~~ Cooling Systems

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

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

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

G. ~~F.~~ Drive Train

~~2. Remove, replace, and adjust cables or linkages for throttle valve (TV), kickdown, and accelerator pedal. HP-G~~

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

H. ~~G.~~ Fuel, Intake and Exhaust Systems

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~~systems~~. HP-G

I. ~~H.~~ Restraint Systems

3. ~~Verify proper~~Inspect the operation of the seatbelt system. HP-I

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

10. Identify components of Supplemental Restraint Systems (SRS). HP-G

V. ~~IV.~~ PAINTING AND REFINISHING

A. Safety Precautions

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

B. Surface Preparation

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

4. Remove~~Strip~~ paint finish as needed~~to bare substrate (paint removal)~~. HP-I

9. Demonstrate different masking techniques (recess/back masking, foam door type, etc.). HP-G

10. Mix primer, primer-surfacer and~~or~~ primer-sealer. HP-I

19. Apply suitable primer sealer to the area being refinished. HP-I

D. Paint Mixing, Matching, and Applying

9. ~~Refinish rigid or semi-rigid plastic parts~~Indentify product expiration dates as applicable. HP-G

10. Refinish ~~flexible~~ plastic parts. HP-I

E. Paint Defects - Causes and Cures

All task in this section that state "determine the cause(s) and correct the condition" have been changed to "correct the cause(s) and the condition.

Tasks affected by this change are tasks 1 - 19, and tasks 22 - 27. No other changes to task in this section were made.

VI. DAMAGE ANALYSIS, ESTIMATING AND CUSTOMER SERVICE

B. ~~A.~~ Damage Analysis

8. Perform visual inspection of structural components ~~and members~~. HP-G

10. Perform visual inspection of non-structural components ~~and members~~. HP-I

C. ~~B.~~ Estimating

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

9. ~~Estimate labor value for operations requiring judgment~~Identify operations requiring labor value judgment. HP-G

~~22. Interpret computer-assisted and manually written estimates; verify the information is current.~~ ~~HP-I~~

22. dentify procedures to restore corrosion protection; establish labor values, and material charges. HP-G

E. ~~D.~~ Customer Relations and Sales Skills

12. Demonstrate~~Apply~~ negotiation skills to obtain a mutual agreement. HP-G

Task List Priority Item Totals (by area)

I. ~~I.~~ Structural Analysis and Damage Repair

HP-I = 16~~30 (includes 17 welding)~~ 95% = 15~~29~~ tasks
HP-G = 27~~32 (includes 2 welding)~~ 90% = 24 ~~29~~tasks

II. Welding, Cutting, and Joining
HP-I = 17 95% = 16 tasks
HP-G = 4 90% = 3 tasks

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

HP-I = 31~~45 (includes 17 welding)~~ 95% = 29~~43~~ tasks
HP-G = 20~~21 (includes 2 welding)~~ 90% = 18~~19~~ tasks

IV. ~~III.~~ Mechanical and Electrical Components

HP-I = 37~~34~~ 95% = 35~~32~~ tasks
HP-G = 73~~71~~ 90% = 66~~64~~ tasks

V. ~~IV.~~ Painting and Refinishing

HP-I = 53~~53~~ 95% = 50~~50~~ tasks
HP-G = 3~~10~~ 90% = 2~~87~~ tasks

VI. ~~V.~~ Damage Analysis, Estimating, Customer Service (DAECS)

HP-I = 30~~27~~ 95% = 28~~26~~ tasks
HP-G = 38~~38~~ 90% = 34~~27~~ tasks