Arizona CTE

Automotive Collision Repair

PERFORM NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR 1.0

1.1 Use proper personal safety equipment and take necessary precautions with hazardous operations and materials in accordance with federal, state, and local regulations 1.1

1.2 Use OEM (Original Equipment Manufacturer/Manufacturing) procedures to identify material and composition of the vehicle being repaired (i.e., mid steel, high strength steel, ultra-high strength steel, aluminum, composites, carbon fiber, etc.) 1.2

1.3 Use procedures and precautions that apply to the vehicle being repaired 1.3

1.4 Identify vehicle system precautions and/or inspections and recommended procedure before inspecting or replacing components [i.e., supplemental restraint system (SRS), advanced driver assistance systems (ADAS), hybrid/electric/alternative fuel vehicles, locations, etc.] 1.4

1.5 Perform vehicle clean-up; complete quality control using a checklist on operations performed (e.g., review estimate and develop a repair plan; secure and store any items in the repair area; remove necessary trim and panels for repair, and bag and tag hardware; vacuum glass from doors, quarters, and floors; and wipe clean any materials on panels and interior parts) 1.5

1.6 Review damage report and analyze damage to determine appropriate methods for overall repair and develop and document a repair plan 1.6

1.7 Inspect, remove, protect, label, store, inventory, and reinstall exterior trim and moldings 1.7

1.8 Inspect, remove, protect, label, store, inventory, and reinstall interior trim and components 1.8

1.9 Inspect, remove, protect, label, store, inventory, and reinstall body panels and components that may interfere with or be damaged during repair 1.9

1.10 Inspect, remove, protect label, store, inventory, and reinstall vehicle mechanical and electrical components that may interfere with or be damaged during repair 1.10

1.11 Protect panels, glass, interior parts, and other vehicles adjacent to the repair area 1.11

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	1.12 Wash entire vehicle with soap and water and complete pre-repair inspection checklist (e.g., secure and store any items in the way of vehicle repair; remove and store any item removed for repair; bag and tag any hardware for easy reassembly; wash vehicle with soap and water; and cover any adjacent panels, glass, and trim to protect from damage during repair) 1.12
	1.13 Prepare damaged area using water-based and solvent-based cleaners 1.13
	1.14 Remove corrosion protection, undercoating, sealers, and other protective coatings as necessary to perform repairs 1.14
	1.15 Inspect, remove, and reinstall repairable plastics and other components for off-vehicle repair 1.15
PERFORM OUTER BODY PANEL REPAIRS, REPLACEMENTS, AND ADJUSTMENTS 2.0	**2.1** Inspect/locate direct, indirect, or hidden damage and direction of impact 2.1
	2.2 Inspect, remove, and replace welded steel panel or panel assemblies 2.2
	2.3 Determine the extent of damage to aluminum body panels and repair, or replace 2.3
	2.4 Inspect, remove, replace, and align hood, hood hinges, and hood latch 2.4
	2.5 Inspect, remove, replace, and align deck lid, lid hinges, and lid latch 2.5
	2.6 Inspect, remove, replace, and align doors, latches, hinges, and related hardware 2.6
	2.7 Inspect, remove, replace, and align tailgates, hatches, liftgates, and sliding doors 2.7
	2.8 Inspect, remove, replace, overhaul, and align bumpers, covers, reinforcement, guards, impact absorbers, and mounting hardware 2.8
	2.9 Inspect, remove, replace, and align fenders, and related panels 2.9
	2.10 Restore corrosion protection during and after the repair 2.10
	2.11 Replace door skins 2.11
	2.12 Restore sound deadeners and foam materials 2.12
	2.13 Perform panel bonding and weld bonding 2.13
	2.14 Diagnose and repair water leaks, dust leaks, and wind noise 2.14
	2.15 Identify one-time use fasteners 2.15
	2.16 Weld damaged or torn steel body panels and repair broken welds 2.16

	2.17 Inspect, identify labels/decals, and replace as necessary 2.17
PERFORM METAL FINISHING AND BODY FILLING 3.0	**3.1** 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 3.1
	3.2 Locate and repair surface irregularities and straighten contours on a damaged body panel using power tools, hand tools, and weld-on pulling attachments 3.2
	3.3 Demonstrate hammer and dolly techniques 3.3
	3.4 Heat shrink stretched panel areas to proper contour 3.4
	3.5 Cold shrink stretched panel areas to proper contour 3.5
	3.6 Identify body filler defects and correct the cause and conditions (i.e., pinholing, ghosting, staining, over catalyzing, etc.) 3.6
	3.7 Identify different types of body fillers 3.7
	3.8 Shape body filler to contour and finish sanding 3.8
	3.9 Perform proper metal finishing techniques for aluminum 3.9
	3.10 Perform proper application of body filler to aluminum 3.10
	3.11 Locate and repair surface irregularities and straighten contours on a damaged panel using Glue-Pulling Dent Repair (GPDR) 3.11
	3.12 Mix and apply body filler 3.12
DETERMINE MOVEABLE GLASS AND HARDWARE REQUIREMENTS 4.0	**4.1** Inspect, adjust, overhaul, repair, or replace window regulators, run channels, glass, power mechanisms, and related controls 4.1
	4.2 Inspect, adjust, repair, remove, reinstall, or replace weather-stripping 4.2
	4.3 Inspect, remove, repair or replace, and adjust removable power-operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs 4.3
	4.4 Inspect, remove, reinstall, and align convertible top and related mechanisms 4.4
	4.5 Identify or recalibrate electrical components that may need to be initialized 4.5
PERFORM PLASTICS, AD[illegible] WE[illegible] RE	**5.1** Identify the types of plastics and determine reparability 5.1
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	5.3 Repair rigid, semi-rigid, and flexible plastic panels 5.3
	5.4 Remove, replace, or repair damaged areas of rigid exterior composite panels 5.4
	5.5 Replace bonded rigid exterior composite body panels and straighten or align panel supports 5.5
	5.6 Repair plastic parts by welding (e.g., nitrogen and airless) 5.6
	5.7 Perform a single-sided adhesively bonded cosmetic repair 5.7
	5.8 Perform a double-sided adhesively bonded repair 5.8
	5.9 Perform an adhesively bonded or welded tab repair 5.9
	5.10 Shape and reform damaged plastic 5.10
APPLY SAFETY PRECAUTIONS WHEN PAINTING AND REFINISHING 6.0	**6.1** Use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (i.e., gloves, suits, hoods, eye and ear protection, etc.) and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations 6.1
	6.2 Identify safety and personal health hazards according to OSHA guidelines and the Right to Know Law 6.2
	6.3 Inspect spray environment and equipment to ensure compliance with federal, state, and local regulations, and for safety and cleanliness hazards 6.3
	6.4 Use a NIOSH approved supplied air (Fresh Air Make-up) respirator system and perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation 6.4
	6.5 Perform vehicle clean-up and complete quality control using a checklist on operations performed (e.g., use soap, water, and sponge to wash vehicle, wheel wells, wheels, door jams, hood, and truck jams; dry vehicle using an absorbent towel; clean all glass and chrome; in booth, pick up any loose paper and tape; sweep, clean floor and walls, and remove water from floors and walls with broom and squeegee) 6.5
PERFORM SURFACE PREPARATION FOR PAINTING AND REFINISHING 7.0	**7.1** Inspect, remove, store, protect, and replace exterior trim and components necessary for proper surface preparation 7.1
	7.2 Wash entire vehicle with soap and water and use appropriate cleaner to remove contaminants 7.2
	7.3 Inspect and identify type of finish, surface condition, and film thickness and develop and document a plan for refinishing using a total product system 7.3

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7.4 Remove paint finish as needed 7.4

7.5 Sand areas to be refinished 7.5

7.6 Sand areas to be refinished Select appropriate sandpaper to featheredge areas to be refinished 7.6

7.7 Apply suitable metal treatment or primer in accordance with total product systems 7.7

7.8 Mask and protect other areas that will not be refinished 7.8

7.9 Demonstrate different masking techniques (i.e., recess/back masking, foam door type, etc.) 7.9

7.10 Mix primer, primer surfacer, and primer sealer following the paint technical data sheet instructions according to the manufacturer 7.10

7.11 Identify a complimentary color or shade of undercoat to improve coverage 7.11

7.12 Apply primer onto surface of repaired area, demonstrating control of primer application by keeping the areas as small as possible 7.12

7.13 Apply two-component finishing filler to minor surface imperfections 7.13

7.14 Guide coat and block sand area with correct grade/grit sandpaper to which primer surfacer has been applied 7.14

7.15 Dry sand area to which two-component finishing filler has been applied 7.15

7.16 Remove dust from area to be refinished, including cracks or moldings of adjacent areas 7.16

7.17 Clean area to be refinished using a recommended final cleaning solution 7.17

7.18 Use a tack rag to remove any dust or lint particles from the area to be refinished 7.18

7.19 Apply suitable primer sealer to the area being refinished 7.19

7.20 Scuff sand to remove nibs or imperfections from a sealer 7.20

7.21 Apply stone chip resistant coating 7.21

7.22 Restore caulking and seam sealers to repaired areas and replacement panels as required 7.22

7.23 Prepare adjacent panels for blending using paint manufacturers procedures 7.23

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	7.24 Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials needed, preparation, and refinishing procedures 7.24
	7.25 Identify metal parts to be refinished and determine the materials needed, preparation, and refinishing procedures 7.25
	7.26 Identify chip resistant coatings and texture match 7.26
	7.27 Identify caulking and seam sealers that may need replacement 7.27
	7.28 Identify refinishing guidelines for stationary glass flange areas to be refinished 7.28
PERFORM SPRAY GUN AND RELATED EQUIPMENT OPERATION 8.0	**8.1** Inspect, clean, and determine condition of spray guns and related equipment (e.g., air hoses, regulators, air lines, air source, spray environment, and filters) 8.1
	8.2 Select spray gun setup (e.g., fluid needle, nozzle, and cap) for product being applied 8.2
	8.3 Test and adjust spray gun using fluid, air and pattern control valves 8.3
	8.4 Operate pressure spray equipment 8.4
PERFORM PAINT MIXING, MATCHING, AND APPLYING PROCEDURES 9.0	**9.1** Identify color code by manufacturer's vehicle information label 9.1
	9.2 Identify product expiration dates 9.2
	9.3 Identify and mix paint using a formula 9.3
	9.4 Shake, stir, reduce, catalyze/activate, and strain refinish materials 9.4
	9.5 Identify the materials equipment and preparation differences between solvent and waterborne technologies 9.5
	9.6 Apply finish using appropriate spray techniques (e.g., gun arc, angle, distance, travel speed, and spray pattern overlap) for the finish being applied 9.6
	9.7 Apply selected product on test or let-down panel with appropriate let-down metal or plastic; check for color match, and properly store and maintain a color catalog 9.7
	9.8 Identify poor hiding colors; determine necessary action 9.8
	9.9 Explain alternate methods of matching color including computerized color matching 9.9
	9.10 Explain the method of paint application of single stage topcoats 9.10

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	9.11 Tint color using formula to achieve a blendable match 9.11
	9.12 Identify alternative color formula to achieve a blendable match 9.12
	9.13 Remove nibs or imperfections from basecoat 9.13
	9.14 Apply basecoat/clearcoat for panel blending, panel refinishing, and cut ins 9.14
	9.15 Apply multi-stage coats for panel blending and overall refinishing 9.15
	9.16 Apply basecoat/clearcoat for overall refinishing 9.16
	9.17 Refinish plastic parts 9.17
DETERMINE PAINT DEFECTS, CAUSES, AND CURES 10.0	**10.1** Identify blistering (raising of the paint surface, air entrapment) and correct the cause(s) and the condition 10.1
	10.2 Identify a dry spray appearance in the paint surface and correct the cause(s) and the condition 10.2
	10.3 Identify the presence of fisheyes (crater-like openings) in the finish and correct the cause(s) and the condition 10.3
	10.4 Identify lifting and correct the cause(s) and the condition 10.4
	10.5 Identify clouding (mottling and streaking in metallic finishes) and correct the cause(s) and the condition 10.5
	10.6 Identify orange peel and correct the cause(s) and the condition 10.6
	10.7 Identify overspray and correct the cause(s) and the condition 10.7
	10.8 Identify solvent popping in freshly painted surface and correct the cause(s) and the condition 10.8
	10.9 Identify sags and runs in paint surface and correct the cause(s) and the condition 10.9
	10.10 Identify sanding marks or sand scratch swelling and correct the cause(s) and the condition 10.10
	10.11 Identify contour mapping/edge mapping while finish is drying and correct the cause(s) and the condition 10.11
	10.12 Identify color difference (off-shade) and correct the cause(s) and the condition 10.12
	13 Identify tape tracking and correct the cause(s) and the condition 10.13
	14 Identify low gloss condition and correct the cause(s) and the condition 10.14

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	10.15 Identify poor adhesion and correct the cause(s) and the condition 10.15	
	10.16 Identify paint cracking (i.e., shrinking, splitting, crow's feet or line-checking, micro-checking, etc.) and correct the cause(s) and the condition 10.16	
	10.17 Identify corrosion and correct the cause(s) and the condition 10.17	
	10.18 Identify dirt or dust in the paint surface and correct the cause(s) and the condition 10.18	
	10.19 Identify water spotting and correct the cause(s) and the condition 10.19	
	10.20 Identify finish damage caused by bird droppings, tree sap, and other natural causes and correct the cause(s) and the condition 10.20	
	10.21 Identify finish damage caused by airborne contaminants (e.g., acids, soot, rail dust, and other industrial-related causes) and correct the cause(s) and the condition 10.21	
	10.22 Identify die-back conditions (dulling of the paint film showing haziness) and correct the cause(s) and the condition 10.22	
	10.23 Identify chalking (oxidation) and correct the cause(s) and the condition 10.23	
	10.24 Identify bleed-through (staining) and correct the cause(s) and the condition 10.24	
	10.25 Identify pin-holing and correct the cause(s) and the condition 10.25	
	10.26 Identify buffing-related imperfections (swirl marks, wheel burns) and correct the condition 10.26	
	10.27 Identify pigment flotation (color change through film build) and correct the cause(s) and the condition 10.27	
PERFORM FINAL PAINTING AND REFINISHING DETAIL 11.0	**11.1** Sand, buff, and polish fresh finish to remove defects and texture as required 11.1	
	11.2 Sand, buff, and polish existing finish to recondition defects as required and match existing finish 11.2	
	11.3 Apply decals, transfers, tapes, stone guards, moldings, and emblems, etc. 11.3	
	11.4 Clean interior, exterior, and glass 11.4	
	11.5 Clean body openings (i.e., door jambs, gaps, and edges, etc.) 11.5	
	5 Remove overspray 11.6	

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	11.7 Perform vehicle clean-up and complete quality control using a checklist on operations performed [e.g., unmask vehicle and place trash in receptacle; steel wool all glass and chrome; (for minor buff, nib sand imperfections in paint, buff imperfections out of panel, and polish areas buffed to remove swirl marks); wash vehicle with soap and water and vacuum interior; and clean glass and apply dressing to tires and trim following safety precautions] 11.7
	11.8 Perform nib sanding to remove small imperfections as required 11.8
PERFORM DAMAGE ANALYSIS 12.0	**12.1** Position the vehicle for inspection under proper lighting, take photos from various angles to identify the vehicle, and document damage 12.1
	12.2 Identify components to be removed to gain access to damaged areas 12.2
	12.3 Analyze damage to determine appropriate methods for overall repairs 12.3
	12.4 Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage 12.4
	12.5 Gather details of the incident/accident necessary to determine the full extent of vehicle damage 12.5
	12.6 Identify and record pre-existing damage 12.6
	12.7 Identify and record prior repairs 12.7
	12.8 Perform visual inspection of structural components and members 12.8
	12.9 Identify structural damage using measuring tools and equipment 12.9
	12.10 Perform visual inspection of non-structural components and members 12.10
	12.11 Determine parts, components, material type(s), and procedures necessary for a proper repair 12.11
	12.12 Identify type and condition of finish and determine refinish labor operations as required 12.12
	12.13 Identify suspension, electrical, and mechanical component physical damage 12.13
	12.14 Identify suspension, electrical, and mechanical component physical damage 12.14
	12.15 Identify interior component damage 12.15
	12.16 Identify add-on accessories and modifications 12.16
	12.17 Identify single (one time) use components 12.17

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12.18 **Document illuminated dash malfunction indicator lamp(s) (MIL)** `12.18`

12.19 **Perform a pre-repair inspection of the vehicle with the customer and record fit and finish concerns (e.g., color mismatch, factory gaps, unrelated prior damage and prior repairs)** `12.19`