Arkansas CTE

Collision Repair - Painting & Refinishing: Grades 9, 10, 11, 12

Adopted 2014

Demonstrate appropriate safety procedures

1.1 Practice shop safety.

1. 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. 1.1.1
2. Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations. 1.1.2
3. Identify safety and personal health hazards according to OSHA guidelines and the "Right to Know Law". 1.1.3
4. Inspect spray environment and equipment to ensure compliance with federal, state and local regulations, and for safety and cleanliness hazards. 1.1.4
5. 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. 1.1.5
6. Select and use a NIOSH approved supplied air (Fresh Air Make-up) respirator system. Perform proper maintenance on the NIOSH in accordance with OSHA Regulation 1910.134 and applicable state and local regulations. 1.1.6
7. 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.). 1.1.7

1.2 Practice personal safety.

1. Identify the location and use of eye wash stations. 1.2.1
2. Identify the location of the posted evacuation routes. 1.2.2
3. Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities. 1.2.3
4. Identify and wear appropriate clothing for lab/shop activities. 1.2.4
5. Secure hair and jewelry for lab/shop activities. 1.2.5
6. Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits. 1.2.6
7. Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.). 1.2.7
8. Locate and demonstrate knowledge of safety data sheets (SDS). 1.2.8
9. Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment. 1.2.9

Demonstrate safe usage of tools and equipment

2.1 Demonstrate knowledge of shop tools and equipment.

1. Identify tools and their usage in automotive applications. 2.1.1
2. Identify standard and metric designation. 2.1.2
3. Demonstrate safe handling and use of appropriate tools. 2.1.3
4. Demonstrate proper cleaning, storage, and maintenance of tools and equipment. 2.1.4

Demonstrate employability/leadership skills

3.1 Demonstrate employability skills.

1. Demonstrate a good work ethic (i.e., relations with others, dependability, attitude, and personal hygiene). 3.1.1
2. Demonstrate teamwork. 3.1.2
3. Demonstrate job-seeking techniques (i.e., write a resume, search for a job, arrange references, and apply interview techniques) 3.1.3
4. Describe legal issues of sexual harassment in the workplace. 3.1.4
5. Identify employment eligibility requirements (e.g. valid driver's license, background check etc.) 3.1.5

3.2 Demonstrate leadership skills.

1. Perform basic parliamentary procedures in a group meeting. 3.2.1
2. Demonstrate an understanding of one's personal values, interpersonal skills, etiquette, effectiveness in oral and written communication and courtesy. Develop and maintain a code of professional ethics. 3.2.2
3. Maintain a good professional appearance. 3.2.3
4. Perform basic tasks related to securing and terminating employees. 3.2.4

Demonstrate surface preparation procedures

4.1 Demonstrate surface preparation procedures.

1. Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation. 4.1.1
2. Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants. 4.1.2
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. 4.1.3
4. Strip paint to bare substrate (paint removal). 4.1.4
5. Dry or wet sand areas to be refinished. 4.1.5
6. Featheredge damaged areas to be refinished. 4.1.6
7. Apply suitable metal treatment or primer in accordance with total product systems. 4.1.7
8. Mask and protect other areas that will not be refinished 4.1.8
9. Mix primer, primer-surfacer or primer-sealer. 4.1.9
10. Identify a complimentary color or shade of undercoat to improve coverage. Apply primer onto surface of repaired area. 4.1.10
11. Apply two-component finishing filler to minor surface imperfections. 4.1.11
12. Dry or wet sand area to which primer-surfacer has been applied. 4.1.12
13. Dry sand area to which two-component finishing filler has been applied. 4.1.13
14. Remove dust from area to be refinished, including cracks or moldings of adjacent areas. 4.1.14
15. Clean area to be refinished using a final cleaning solution. 4.1.15
16. Remove, with a tack rag, any dust or lint particles from the area to be refinished. 4.1.16
17. Apply suitable sealer to the area being refinished. 4.1.17
18. Scuff sand to remove nibs or imperfections from a sealer. 4.1.18
19. Apply stone chip resistant coating. 4.1.19
20. Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas. 4.1.20
21. Prepare adjacent panels for blending. 4.1.21
22. Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures. 4.1.22
23. Identify aluminum parts to be refinished; determine the materials, preparation, and refinishing procedures. 4.1.23

4.2 Demonstrate 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). 4.2.1
2. Check and adjust spray gun operation for HVLP (high volume, low pressure) or compliant spray guns. 4.2.2
3. Set-up (fluid needle, nozzle, and cap), test, and adjust spray gun using fluid, air, and pattern control valves. 4.2.3
4. Demonstrate an understanding of the operation of pressure spray equipment. 4.2.4

4.3 Demonstrate paint mixing, matching, and applying procedures.

1. Identify type and color code by manufacturer's vehicle information label. 4.3.1
2. Shake, stir, reduce, catalyze/activate, and strain refinish materials. 4.3.2
3. Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied. 4.3.3
4. Apply selected product on test and let-down panel; check for color match. 4.3.4
5. Apply single stage topcoat. 4.3.5
6. Apply basecoat/clearcoat for panel blending or panel refinishing. 4.3.6
7. Apply basecoat/clearcoat for overall refinishing. 4.3.7
8. Remove nibs or imperfections from basecoat. 4.3.8
9. Refinish rigid or semi-rigid, and plastic parts. 4.3.9
10. Refinish flexible plastic parts. 4.3.10
11. Apply multi-stage coats for panel blending or overall refinishing. 4.3.11
12. Identify and mix paint using a formula. 4.3.12
13. Identify poor hiding colors; determine necessary action. 4.3.13
14. Tint color using formula to achieve a blendable match. 4.3.14
15. Identify alternative color formula to achieve a blendable match. 4.3.15
16. Identify the materials equipment, and preparation differences between solvent and waterborne technologies. 4.3.16

4.4 Evaluate the causes of paint defects and determine the appropriate cure.

1. Identify blistering (raising of the paint surface, air entrapment); determine the cause(s) and correct the condition. 4.4.1
2. Identify blushing (milky or hazy formation); determine the cause(s) and correct the condition. 4.4.2
3. Identify a dry spray appearance in the paint surface; determine the cause(s) and correct the condition. 4.4.3
4. Identify the presence of fish-eyes (crater-like openings) in the finish; determine the cause(s) and correct the condition. 4.4.4
5. Identify lifting; determine the cause(s) and correct the condition. 4.4.5
6. Identify clouding (mottling and streaking in metallic finishes); determine the cause(s) and correct the condition. 4.4.6
7. Identify orange peel; determine the cause(s) and correct the condition. 4.4.7
8. Identify overspray; determine the cause(s) and correct the condition. 4.4.8
9. Identify solvent popping in freshly painted surface; determine the cause(s) and correct the condition. 4.4.9
10. Identify sags and runs in paint surface; determine the cause(s) and correct the condition. 4.4.10
11. Identify sanding marks or sandscratch swelling; determine the cause(s) and correct the condition. 4.4.11
12. Identify contour mapping/edge mapping while finish is drying; determine the cause(s) and correct the condition. 4.4.12
14. Identify tape tracking; determine the cause(s) and correct the condition. 4.4.14
15. Identify low gloss condition; determine the cause(s) and correct the condition. 4.4.15
16. Identify poor adhesion; determine the cause(s) and correct the condition. 4.4.16
17. Identify paint cracking (shrinking, splitting, crowsfeet or line-checking, micro-checking, etc.); determine the cause(s) and correct the condition. 4.4.17
18. Identify corrosion; determine the cause(s) and correct the condition. 4.4.18
19. Identify dirt or dust in the paint surface; determine the cause(s) and correct the condition. 4.4.19
20. Identify water spotting; determine the cause(s) and correct the condition. 4.4.20
21. Identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition. 4.4.21
22. Identify finish damage caused by airborne contaminants (acids, soot, rail dust, and other industrial-related causes); correct the condition. 4.4.22

23. Identify die-back conditions (dulling of the paint film showing haziness); determine the cause(s) and correct the condition. 4.4.23
24. Identify chalking (oxidation); determine the cause(s) and correct the condition. 4.4.24
25. Identify bleed-through (staining); determine the cause(s) and correct the condition. 4.4.25
26. Identify pin-holing; determine the cause(s) and correct the condition. 4.4.26
27. Identify buffing-related imperfections (swirl marks, wheel burns); correct the condition. 4.4.27
28. Identify pigment flotation (color change through film build); determine the cause(s) and correct the condition. 4.4.28

4.5 Demonstrate final detail procedures.

1. Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc. 4.5.1
2. Buff and polish finish to remove defects as required. 4.5.2
3. Clean interior, exterior, and glass. 4.5.3
4. Clean body openings (door jambs and edges, etc.). 4.5.4
5. Remove overspray. 4.5.5
6. Perform pre-delivery detail and inspection. 4.5.6

Preparing vehicle for service/customer

5.1 Prepare a vehicle for service as listed on the work order.

1. Identify information needed and the service requested on a repair order. 5.1.1
2. Identify purpose and demonstrate proper use of fender covers, mats. 5.1.2
3. Demonstrate use of the three C's (concern, cause, and correction). 5.1.3
4. Review vehicle service history. 5.1.4
5. Complete work order to include customer information, vehicle identifying information, customer concerns, related service history, cause, and correction. 5.1.5

5.2 Prepare vehicle for customer.

1. Ensure vehicle is prepared to return to customer per school or company policy (floor mats, steering wheel cover, etc.). 5.2.1

Demonstrate damage analysis, estimating, and customer service procedures

6.1 Evaluate vehicle damage and demonstrate appropriate procedures.

1. Position the vehicle for inspection. 6.1.1
2. Prepare vehicle for inspection by providing access to damaged areas. 6.1.2
3. Analyze damage to determine appropriate methods for overall repairs. 6.1.3
4. Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage 6.1.4
5. Gather details of the incident/accident necessary to determine the full extent of vehicle damage. 6.1.5
6. Identify and record pre-existing damage. 6.1.6
7. Identify and record prior repairs. 6.1.7
8. Perform visual inspection of structural components and members. 6.1.8
9. Identify structural damage using measuring tools and equipment. 6.1.9
10. Perform visual inspection of non-structural components and members. 6.1.10
11. Determine parts, components, material type(s) and procedures necessary for a proper repair. 6.1.11
12. Identify type and condition of finish; determine if refinishing is required. 6.1.12
13. Identify suspension, electrical and mechanical component physical damage. 6.1.13
14. Identify safety systems physical damage. 6.1.14
15. Identify interior component damage. 6.1.15
16. Identify damage to add-on accessories and modifications. 6.1.16
17. Identify single (one time) use components. 6.1.17

6.2 Demonstrate estimating procedures.

1. Determine and record customer/vehicle owner information. Identify and record vehicle identification number (VIN) information, including nation of origin, make, model, restraint system, body type, production date, engine type, and assembly plant. Identify and record vehicle options, including trim level, paint code, transmission, accessories, and modifications. 6.2.1
2. Identify safety systems; determine replacement items. 6.2.2
3. Apply appropriate estimating and parts nomenclature (terminology). 6.2.3
4. Determine and apply appropriate estimating sequence. 6.2.4
5. Utilize estimating guide procedure pages. 6.2.5
6. Apply estimating guide footnotes and headnotes as needed. 6.2.6
7. Estimate labor value for operations requiring judgment. 6.2.7
8. Select appropriate labor value for each operation (structural, non-structural, mechanical, and refinish). 6.2.8
9. Select and price OEM parts; verify availability, compatibility, and condition. 6.2.9
10. Select and price alternative/optional OEM parts, aftermarket parts, remanufactured, rebuilt, and reconditioned parts, recyclable/used parts; verify availability, compatibility and condition. 6.2.10
11. Determine price and source of necessary sublet operations. 6.2.11
12. Determine labor value, prices, charges, allowances, or fees for non-included operations and miscellaneous items. 6.2.12
13. Recognize and apply overlap deductions, included operations, and additions. 6.2.13
14. Determine additional material and charges. Determine refinishing material and charges. Apply math skills to establish charges and totals. 6.2.14
15. Interpret computer-assisted and manually written estimates; verify the information is current. 6.2.15
16. Identify procedural differences between computer-assisted systems and manually written estimates. 6.2.16
17. Identify procedures to restore corrosion protection; establish labor values, and material charges. 6.2.17
18. Determine the cost effectiveness of the repair and determine the approximate vehicle retail, and repair value. 6.2.18
19. Recognize the differences in estimation procedures when using different information provider systems. 6.2.19
20. Verify accuracy of estimate compared to the actual repair and replacement operations. 6.2.20

6.3 Demonstrate vehicle construction and parts identification procedures.

1. Identify type of vehicle construction (space frame, unibody, body-over-frame). Recognize the different damage characteristics of space frame, unibody, and body-over-frame vehicles. Identify impact energy absorbing components. 6.3.1
2. Identify steel types; determine repairability. Identify aluminum/magnesium components; determine repairability. Identify plastic/composite components; determine repairability. Identify vehicle glass components and repair/replacement procedures. Identify add-on accessories. 6.3.2

6.4 Eemonstrate customer relations and sales skills.

1. Acknowledge and/or greet customer/client. Listen to customer/client; collect information and identify customers/client's concerns, needs and expectations. Establish cooperative attitude with customer/client. Identify yourself to customer/client; offer assistance. 6.4.1
2. Appropriately manage angry customer/client situations. Identify customer/client preferred communication method; follow up to keep customer/client informed about parts and the repair process. 6.4.2
3. Recognize basic claims handling procedures and explain to customer/client while projecting a positive attitude and professional appearance. 6.4.3
4. Provide and review warranty information. Provide and review technical and consumer protection information. Estimate and explain duration of out-of-service time. Apply negotiation skills to obtain a mutual agreement. Interpret and explain manual or computer-assisted estimate to customer/client 6.4.4