

STRANDS AND STANDARDS

COLLISION REFINISHING AND PAINTING



Course Description

This course prepares individuals to safely prepare, mask, prime, seal, and paint vehicles and parts; use and maintain spray guns, booths, and equipment; address paint defects; mix, match, tint, and blend paint; store and dispose of hazardous materials; understand the corrosion protection process; and sand, buff, and detail a refinished vehicle. Work ethics and productivity are an integral part of the classroom and laboratory activities of this program.

(asestudentcertification.com), (http://pdmdev.i-car.com/pdf/education_foundation/natef_crosswalk_2006.pdf)

COLLISION REFINISHING AND PAINTING

Intended Grade Level	10-12
Units of Credit	0.5
Core Code	40.09.00.00.015
Concurrent Enrollment Core Code	40.09.00.13.015
Prerequisite	Basic Automotive Collision Repair
Skill Certification Test Number	N/A
Test Weight	N/A
License Type	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Automotive Collision Repair
Endorsement 2	N/A
Endorsement 3	N/A

STRAND 1

Students will be able to understand and demonstrate safety and environmental practices.

Standard 1

Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations.

Standard 2

Identify safety and personal health hazards according to OSHA guidelines and the “Right to Know Law”.

Standard 3

Inspect spray environment and equipment to ensure compliance with federal, state and local regulations, and for safety and cleanliness hazards.

Standard 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.

Standard 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.

Standard 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.).

COLLISION REFINISHING AND PAINTING

Performance Skill

Understand and demonstrate safety and environmental practices.

- Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations.
- Identify safety and personal health hazards according to OSHA guidelines and the “Right to Know Law”.
- Inspect spray environment and equipment to ensure compliance with federal, state and local regulations, and for safety and cleanliness hazards.
- 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.
- 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.
- 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.).

STRAND 2

Students will be able to understand and demonstrate proper surface preparation.

Standard 1

Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation.

Standard 2

Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants, including plastics with anti-static wipes.

Standard 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.

Standard 4

Remove paint finish.

Standard 5

Dry or wet sand areas to be refinished.

Standard 6

Featheredge damaged areas to be refinished.

Standard 7

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

COLLISION REFINISHING AND PAINTING

Standard 8

Mask and protect other areas that will not be refinished.

Standard 9

Mix primer, primer-surfacer or primer-sealer.

Standard 10

Apply primer onto surface of repaired area.

Standard 11

Apply two-component finishing filler to minor surface imperfections.

Standard 12

Dry or wet sand area to which primer-surfacer has been applied.

Standard 13

Sand area to which two-component finishing filler has been applied.

Standard 14

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

Standard 15

Clean area to be refinished using a final cleaning solution.

Standard 16

Remove, with a tack rag, any dust or lint particles from the area to be refinished.

Standard 17

Apply suitable sealer to the area being refinished when sealing is needed or desirable.

Standard 18

Scuff sand to remove nibs or imperfections from a sealer.

Standard 19

Apply stone chip resistant coating.

Standard 20

Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas.

Standard 21

Prepare adjacent panels for blending.

Standard 22

Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinish procedures.

COLLISION REFINISHING AND PAINTING

Standard 23

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

Performance Skill

Understand and demonstrate proper surface preparation.

- Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation.
- Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants, including plastics with anti-static wipes.
- Inspect and identify substrate, type of finish, surface condition, and film thickness; develop and document a plan for refinishing using a total product system.
- Remove paint finish.
- Dry or wet sand areas to be refinished.
- Featheredge damaged areas to be refinished.
- Apply suitable metal treatment or primer in accordance with total product systems.
- Mask and protect other areas that will not be refinished.
- Mix primer, primer-surfacer or primer-sealer.
- Apply primer onto surface of repaired area.
- Apply two-component finishing filler to minor surface imperfections.
- Dry or wet sand area to which primer-surfacer has been applied.
- Sand area to which two-component finishing filler has been applied.
- Remove dust from area to be refinished, including cracks or moldings of adjacent areas.
- Clean area to be refinished using a final cleaning solution.
- Remove, with a tack rag, any dust or lint particles from the area to be refinished.
- Apply suitable sealer to the area being refinished when sealing is needed or desirable.
- Scuff sand to remove nibs or imperfections from a sealer.
- Apply stone chip resistant coating.
- Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas.
- Prepare adjacent panels for blending.
- Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures.
- Identify aluminum parts to be refinished; determine the materials, preparation, and refinishing procedures.

COLLISION REFINISHING AND PAINTING

STRAND 3

Students will be able to safely operate, clean, and maintain spray guns and related equipment.

Standard 1

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

Standard 2

Check and adjust spray gun operation for HVLP (high volume, low pressure) or LVLP (low volume, low pressure) guns.

Standard 3

Set-up (fluid needle, nozzle, and cap), adjust, and test spray gun using fluid, air, and pattern control valves.

Performance Skill

Safely operate, clean, and maintain spray guns and related equipment.

- Inspect, clean, and determine condition of spray guns and related equipment (air hoses, regulators, air lines, air source, and spray environment).
- Check and adjust spray gun operation for HVLP (high volume, low pressure) or LVLP (low volume, low pressure) guns.
- Set-up (fluid needle, nozzle, and cap), adjust, and test spray gun using fluid, air, and pattern control valves.

STRAND 4

Students will be able to correctly mix, match, and apply paint.

Standard 1

Determine type and color of paint already on vehicle by manufacturer's vehicle information label.

Standard 2

Shake, stir, reduce, catalyze/activate, and strain paint.

Standard 3

Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.

Standard 4

Apply selected product on test and let-down panel; check for color match.

Standard 5

Apply basecoat/clearcoat for panel blending or partial refinishing.

COLLISION REFINISHING AND PAINTING

Standard 6

Apply basecoat/clearcoat for overall refinishing.

Standard 7

Nib sand, buff, and polish finished where necessary.

Standard 8

Refinish rigid, semi-rigid, and flexible plastic parts.

Standard 9

Apply multi-stage coats for panel blending or overall refinishing.

Standard 10

Identify and mix pain using a formula.

Standard 11

Identify poor hiding colors; determine necessary action.

Standard 12

Tint color using formula to achieve a blendable match.

Standard 13

Identify alternative color formula to achieve a blendable match.

Performance Skill

Correctly mix, match, and apply paint.

- Determine type and color of paint already on vehicle by manufacturer's vehicle information label.
- Shake, stir, reduce, catalyze/activate, and strain paint.
- Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.
- Apply selected product on test and let-down panel; check for color match.
- Apply basecoat/clearcoat for panel blending or partial refinishing.
- Apply basecoat/clearcoat for overall refinishing.
- Nib sand, buff, and polish finished where necessary.
- Refinish rigid, semi-rigid, and flexible plastic parts.
- Apply multi-stage coats for panel blending or overall refinishing.
- Identify and mix pain using a formula.
- Identify poor hiding colors; determine necessary action.
- Tint color using formula to achieve a blendable match.
- Identify alternative color formula to achieve a blendable match.

COLLISION REFINISHING AND PAINTING

STRAND 5

Students will be able to understand causes and demonstrate cures of paint defects.

Standard 1

Identify blistering (raising of the paint surface); determine the cause(s) and correct the condition.

Standard 2

Identify blushing (milky or hazy formation); determine the cause(s) and correct the condition.

Standard 3

Identify a dry spray appearance in the paint surface; determine the cause(s) and correct the condition.

Standard 4

Identify the presence of fish-eyes (crater-like openings) in the finish; determine the cause(s) and correct the condition.

Standard 5

Identify lifting; determine the cause(s) and correct the condition.

Standard 6

Identify clouding (mottling and streaking in metallic finishes); determine the cause(s) and correct the condition.

Standard 7

Identify orange peel; determine the cause(s) and correct the condition.

Standard 8

Identify overspray; determine the cause(s) and correct the condition.

Standard 9

Identify solvent popping in freshly painted surface; determine the cause(s) and correct the condition.

Standard 10

Identify sags and runs in paint surface; determine the cause(s) and correct the condition.

Standard 11

Identify sanding marks (sandscratch swelling); determine the cause(s) and correct the condition.

Standard 12

Identify contour mapping (shrinking and splitting) while finish is drying; determine the cause(s) and correct the condition.

COLLISION REFINISHING AND PAINTING

Standard 13

Identify color difference (off-shade); determine the cause(s) and correct the condition.

Standard 14

Identify tape tracking; determine the cause(s) and correct the condition.

Standard 15

Identify low gloss condition; determine the cause(s) and correct the condition.

Standard 16

Identify poor adhesion; determine the cause(s) and correct the condition.

Standard 17

Identify paint cracking (crowsfeet or line-checking, micro-checking, etc.); determine the cause(s) and correct the condition.

Standard 18

Identify corrosion; determine the cause(s) and correct the condition.

Standard 19

Identify dirt or dust in the paint surface; determine the cause(s) and correct the condition.

Standard 20

Identify water spotting; determine the cause(s) and correct the condition.

Standard 21

Identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition.

Standard 22

Identify finish damage caused by airborne contaminants (acids, soot, rail dust, and other industrial-related causes); correct the condition.

Standard 23

Identify die-back conditions (dulling of the paint film showing haziness); determine the cause(s) and correct the condition.

Standard 24

Identify chalking (oxidation); determine the cause(s) and correct the condition.

Standard 25

Identify bleed-through (staining); determine the cause(s) and correct the condition.

Standard 26

Identify pin-holing; determine the cause(s) and correct the condition.

Standard 27

Identify buffing-related imperfections (swirl marks, wheel burns); correct the condition.

COLLISION REFINISHING AND PAINTING

Standard 28

Identify pigment flotation (color change through film build); determine the cause(s) and correct the condition.

Standard 29

Measure mil thickness.

Performance Skill

Understand causes and demonstrate cures of paint defects.

- Identify blistering (raising of the paint surface); determine the cause(s) and correct the condition.
- Identify blushing (milky or hazy formation); determine the cause(s) and correct the condition.
- Identify a dry spray appearance in the paint surface; determine the cause(s) and correct the condition.
- Identify the presence of fish-eyes (crater-like openings) in the finish; determine the cause(s) and correct the condition.
- Identify lifting; determine the cause(s) and correct the condition.
- Identify clouding (mottling and streaking in metallic finishes); determine the cause(s) and correct the condition.
- Identify orange peel; determine the cause(s) and correct the condition.
- Identify overspray; determine the cause(s) and correct the condition.
- Identify solvent popping in freshly painted surface; determine the cause(s) and correct the condition.
- Identify sags and runs in paint surface; determine the cause(s) and correct the condition.
- Identify sanding marks (sandscratch swelling); determine the cause(s) and correct the condition.
- Identify contour mapping (shrinking and splitting) while finish is drying; determine the cause(s) and correct the condition.
- Identify color difference (off-shade); determine the cause(s) and correct the condition.
- Identify tape tracking; determine the cause(s) and correct the condition.
- Identify poor adhesion; determine the cause(s) and correct the condition.
- Identify paint cracking (crowsfeet or line-checking, micro-checking, etc.); determine the cause(s) and correct the condition.
- Identify corrosion; determine the cause(s) and correct the condition.
- Identify dirt or dust in the paint surface; determine the cause(s) and correct the condition.
- Identify water spotting; determine the cause(s) and correct the condition.
- Identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition.

COLLISION REFINISHING AND PAINTING

- Identify finish damage caused by airborne contaminants (acids, soot, rail dust, and other industrial-related causes); correct the condition.
- Identify die-back conditions (dulling of the paint film showing haziness); determine the cause(s) and correct the condition.
- Identify chalking (oxidation); determine the cause(s) and correct the condition.
- Identify bleed-through (staining); determine the cause(s) and correct the condition.
- Identify pin-holing; determine the cause(s) and correct the condition.
- Identify buffing-related imperfections (swirl marks, wheel burns); correct the condition.
- Identify pigment flotation (color change through film build); determine the cause(s) and correct the condition.
- Measure mil thickness.

STRAND 6

Students will be able to perform final detailing operations.

Standard 1

Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc.

Standard 2

Buff and polish finish to remove defects as required.

Standard 3

Clean interior, exterior, and glass.

Standard 4

Clean body openings (door jambs and edges, etc.).

Standard 5

Remove overspray.

Performance Skill

Perform final detailing operations.

- Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc.
- Buff and polish finish to remove defects as required.
- Clean interior, exterior, and glass.
- Clean body openings (door jambs and edges, etc.).
- Remove overspray.

STRAND 7

Students will understand the importance of career readiness skills as it relates to the workplace and outlined in the SkillsUSA Framework – Level 2.

COLLISION REFINISHING AND PAINTING

Standard 1

Understand and demonstrate reliability.

- Determine individual time management skills.
- Explore what's ethical in the workplace or school.
- Demonstrate awareness of government.
- Demonstrate awareness of professional organizations and trade unions.

Standard 2

Understand and demonstrate responsiveness.

- Define the customer.
- Recognize benefits of doing a community service project.
- Demonstrate social etiquette.
- Identify customer expectations.

Standard 3

Understand resiliency.

- Discover self-motivation techniques and establish short-term goals.
- Select characters of a positive image.
- Identify a mentor.

Standard 4

Understand and demonstrate workplace habits.

- Participate in a shadowing activity.
- Explore workplace ethics: codes of conduct.
- Recognize safety issues.
- Perform a skill demonstration.
- Exercise your right to know.

Standard 5

Understand and develop initiative.

- Develop personal financial skills.
- Develop a business plan.
- Investigate entrepreneurship opportunities.

Standard 6

Understand and demonstrate continuous improvement.

- Conduct a worker interview.
- Demonstrate evaluation skills.
- Examine ethics and values in the workplace.
- Develop a working relationship with a mentor.
- Construct a job search network.