Course Description

This course prepares individuals to perform non-structural repair, replacement, and adjustment of automotive outer body panels and uni-body components. This course is based on the Automotive Service Excellence (ASE) automotive collision task list and the I-CAR training program. 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)
C O L L I S I O N  N O N - S T R U C T U R A L  R E P A I R

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<thead>
<tr>
<th><strong>Intended Grade Level</strong></th>
<th>10-12</th>
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<td><strong>Units of Credit</strong></td>
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<td><strong>Core Code</strong></td>
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<td><strong>Concurrent Enrollment Core Code</strong></td>
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<tr>
<td><strong>Prerequisite</strong></td>
<td>Basic Automotive Collision Repair</td>
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<tr>
<td><strong>Skill Certification Test Number</strong></td>
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<td><strong>Required Endorsement(s)</strong></td>
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<td><strong>Endorsement 2</strong></td>
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**STRAND 1**

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

**Standard 1**

Explain the need for regulations and safety devices such as Environment Protection, state and local environmental laws, and regulations involved with the refinishing department. (4A1)

**Standard 2**

Locate hazardous warning information for products used in refinishing. Be able to locate basic information from a Material Safety Data Sheet (MSDS). (4A2)

**Standard 3**

Identify and select the proper personal protection equipment, inspect it, and demonstrate its proper use. (4A3)

**Standard 4**

Identify the Volatile Organic Compound (VOC) content of paint products and explain the environmental concerns. (4A4)

**Standard 5**

Understand safety practices related to general shop, personal protection, vehicle lifts, and hand and power equipment. (1A1)

**Standard 6**

Understand and identify different fasteners and their applications and repair procedures. (1B2)

**Standard 7**

Understand how to select and properly use hand and select power tools. (1B7)
Performance Skill
Understand and demonstrate safety and environmental practices.

- Explain the need for regulations and safety devices such as Environment Protection, state and local environmental laws, and regulations involved with the refinishing department. (4A1)
- Locate hazardous warning information for products used in refinishing. Be able to locate basic information from a Material Safety Data Sheet (MSDS). (4A2)
- Identify and select the proper personal protection equipment, inspect it, and demonstrate its proper use. (4A3)
- Identify the Volatile Organic Compound (VOC) content of paint products and explain the environmental concerns. (4A4)
- Understand safety practices related to general shop, personal protection, vehicle lifts, and hand and power equipment. (1A1)
- Understand and identify different fasteners and their applications and repair procedures. (1B2)
- Understand how to select and properly use hand and select power tools. (1B7)

STRAND 2
Students will be able to understand and demonstrate vehicle preparation.

Standard 1
Review damage report and analyze damage to determine appropriate methods for overall repair; develop and document a repair plan.

Standard 2
Inspect, remove, store, and replace exterior trim and moldings.

Standard 3
Inspect, remove, store, and replace interior trim and components.

Standard 4
Inspect, remove, store, and replace non-structural body panels and components that may interfere with or be damaged during repair.

Standard 5
Inspect, remove, store, and replace all vehicle mechanical and electrical components that may interfere with or be damaged during repair.

Standard 6
Protect panels, glass, and parts adjacent to the repair area.

Standard 7
Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants from those areas to be repaired.
Standard 8
Remove corrosion protection, undercoatings, sealers, and other protective coatings necessary to perform repairs.

Standard 9
Inspect, remove, and replace repairable plastics and other components that are recommended for off-vehicle repair.

Performance Skill
Understand and demonstrate vehicle preparation.
- Review damage report and analyze damage to determine appropriate methods for overall repair; develop and document a repair plan.
- Inspect, remove, store, and replace exterior trim and moldings.
- Inspect, remove, store, and replace interior trim and components.
- Inspect, remove, store, and replace non-structural body panels and components that may interfere with or be damaged during repair.
- Inspect, remove, store, and replace all vehicle mechanical and electrical components that may interfere with or be damaged during repair.
- Protect panels, glass, and parts adjacent to the repair area.
- Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants from those areas to be repaired.
- Remove corrosion protection, undercoatings, sealers, and other protective coatings necessary to perform repairs.
- Inspect, remove, and replace repairable plastics and other components that are recommended for off-vehicle repair.

STRAND 3
Students will be able to understand and demonstrate outer body panel repairs, replacement, and adjustments.

Standard 1
Determine the extent of direct and indirect damage and direction of impact; develop and document a repair plan.

Standard 2
Inspect, remove and replace bolted, bonded, and welded steel panel or panel assemblies.

Standard 3
Determine the extent of damage to aluminum body panels; repair or replace.

Standard 4
Inspect, remove, replace, and align hood, hood hinges, and hood latch.

Standard 5
Inspect, remove, replace, and align deck lid, lid hinges, and lid latch.
Standard 6
Inspect, remove, replace, and align doors, tailgates, hatches, lift gates, latches, hinges, and related hardware.

Standard 7
Inspect, remove, replace, and align bumper bars, covers, reinforcement, guards, isolators, and mounting hardware.

Standard 8
Inspect, remove, replace, and align front fenders, headers, and other panels.

Standard 9
Straighten and rough-out contours of damaged panels to a suitable condition for body filling or metal finishing using power tools, hand tools, and weld-on pull attachments.

Standard 10
Weld damaged or torn steel body panels; repair broken welds.

Standard 11
Restore corrosion protection.

Standard 12
Replace door skins.

Standard 13
Restore sound deadeners and foam materials.

Standard 14
Perform panel bonding.

Standard 15
Diagnose and repair water leaks, dust leaks, and wind noise.

Performance Skill
Understand and demonstrate outer body panel repairs, replacement, and adjustments.

- Determine the extent of direct and indirect damage and direction of impact; develop and document a repair plan.
- Inspect, remove and replace bolted, bonded, and welded steel panel or panel assemblies.
- Determine the extent of damage to aluminum body panels; repair or replace.
- Inspect, remove, replace, and align hood, hood hinges, and hood latch.
- Inspect, remove, replace, and align deck lid, lid hinges, and lid latch.
- Inspect, remove, replace, and align doors, tailgates, hatches, lift gates, latches, hinges, and related hardware.
- Inspect, remove, replace, and align bumper bars, covers, reinforcement, guards, isolators, and mounting hardware.
C O L L I S I O N  N O N - S T R U C T U R A L  R E P A I R

- Inspect, remove, replace, and align front fenders, headers, and other panels.
- Straighten and rough-out contours of damaged panels to a suitable condition for body filling or metal finishing using power tools, hand tools, and weld-on pull attachments.
- Weld damaged or torn steel body panels; repair broken welds.
- Restore corrosion protection.
- Replace door skins.
- Restore sound deadeners and foam materials.
- Perform panel bonding.
- Diagnose and repair water leaks, dust leaks, and wind noise.

**STAND 4**
*Students will be able to understand and demonstrate metal finishing and body filler.*

**Standard 1**
Remove paint from the damaged area of a body panel.

**Standard 2**
Locate and reduce surface irregularities on a damaged body panel.

**Standard 3**
Demonstrate hammer and dolly techniques.

**Standard 4**
Heat shrink stretched panel areas to proper contour.

**Standard 5**
Cold shrink stretched panel areas to proper contour.

**Standard 6**
Mix body filler.

**Standard 7**
Apply body filler, shape during curing.

**Standard 8**
Rough sand cured body filler to contour; finish sand.

**Standard 9**
Determine the proper metal finishing techniques for aluminum.

**Standard 10**
Determine proper application of body filler to aluminum.
**Performance Skill**

Understand and demonstrate metal finishing and body filler.

- Remove paint from the damaged area of a body panel.
- Locate and reduce surface irregularities on a damaged body panel.
- Demonstrate hammer and dolly techniques.
- Heat shrink stretched panel areas to proper contour.
- Cold shrink stretched panel areas to proper contour.
- Mix body filler.
- Apply body filler, shape during curing.
- Rough sand cured body filler to contour; finish sand.
- Determine the proper metal finishing techniques for aluminum.
- Determine proper application of body filler to aluminum.

**STRAND 5**

Students will be able to understand and demonstrate repair, replacement, and adjustment of moveable glass and hardware.

**Standard 1**

Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls.

**Standard 2**

Diagnose and repair water leaks, dust leaks, and wind noises; inspect, repair, and replace weather-stripping.

**Standard 3**

Inspect, repair or replace, and adjust removable, manually or power operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs.

**Performance Skill**

Understand and demonstrate repair, replacement, and adjustment of moveable glass and hardware.

- Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls.
- Diagnose and repair water leaks, dust leaks, and wind noises; inspect, repair, and replace weather-stripping.
- Inspect, repair or replace, and adjust removable, manually or power operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs.

**STRAND 6**

Students will be able to understand and demonstrate metal welding and cutting.

**Standard 1**

Identify weldable and non-weldable materials used in collision repair.
Standard 2
Weld and cut high-strength steel and other steels.

Standard 3
Weld and cut aluminum.

Standard 4
Determine the correct GMAW (MIG) welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation.

Standard 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 material being welded.

Standard 6
Store, handle, and install high-pressure gas cylinders.

Standard 7
Determine work clamp (ground) location and attach.

Standard 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.

Standard 9
Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.

Standard 10
Protect computers and other electronic control modules during welding procedures.

Standard 11
Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp as required.

Standard 12
Determine the joint type (butt weld with backing, lap, etc.) for weld being made.

Standard 13
Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation.

Standard 14
Perform the following welds: continuous, stitch, tack, plug, butt weld with and without backing, and fillet.

Standard 15
Perform visual and destructive tests on each weld type.
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Standard 16
Identify the causes of various welding defects; make necessary adjustments.

Standard 17
Identify the cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.

Standard 18
Identify the cutting process for different materials and locations; perform cutting operation.

Standard 19
Identify different methods of attaching non-structural components (squeeze type resistant spot welds (STRSW), riveting, non-structural adhesive, silicon bronze, etc.).

Performance Skill
Understand and demonstrate metal welding and cutting.

- Identify weldable and non-weldable materials used in collision repair.
- Weld and cut high-strength steel and other steels.
- Weld and cut aluminum.
- Determine the correct GMAW (MIG) welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation.
- 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 material being welded.
- Store, handle, and install high-pressure gas cylinders.
- Determine work clamp (ground) location and attach.
- 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.
- Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.
- Protect computers and other electronic control modules during welding procedures.
- Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp as required.
- Determine the joint type (butt weld with backing, lap, etc.) for weld being made.
- Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation.
- Perform the following welds: continuous, stitch, tack, plug, butt weld with and without backing, and fillet.
- Perform visual and destructive tests on each weld type.
- Identify the causes of various welding defects; make necessary adjustments.
- Identify the cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.
- Identify the cutting process for different materials and locations; perform cutting operation.
• Identify different methods of attaching non-structural components (squeeze type resistant spot welds (STRSW), riveting, non-structural adhesive, silicon bronze, etc.).

STRAND 7
Students will be able to understand and demonstrate plastics using adhesives.

Standard 1
Identify the types of plastics; determine reparability.

Standard 2
Identify the types of plastic repair procedures; clean and prepare the surface of plastic parts.

Standard 3
Replace or repair rigid, semi-rigid, and flexible plastic panels.

Standard 4
Remove or repair damaged areas from rigid exterior composite panels.

Standard 5
Replace bonded rigid exterior composite body panels; straighten or align panel supports.

Performance Skill
Understand and demonstrate how to repair plastics using adhesives.
  • Identify the types of plastics; determine reparability.
  • Identify the types of plastic repair procedures; clean and prepare the surface of plastic parts.
  • Replace or repair rigid, semi-rigid, and flexible plastic panels.
  • Remove or repair damaged areas from rigid exterior composite panels.
  • Replace bonded rigid exterior composite body panels; straighten or align panel supports.

STRAND 8
Students will be able to understand and perform damage analysis.

Standard 1
Position the vehicle for inspection.

Standard 2
Prepare vehicle for inspection by providing access to damaged areas.

Standard 3
Analyze damage to determine appropriate methods for overall repairs.

Standard 4
Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage.
Standard 5
Gather details of the incident/accident necessary to determine the full extent of vehicle damage.

Standard 6
Perform visual inspection of structural components and members.

Standard 7
Identify structural damage using measuring tools and equipment.

Standard 8
Perform visual inspection of non-structural components and members.

Standard 9
Determine parts, components, material type(s) and procedures necessary for a proper repair.

Standard 10
Identify suspension, electrical, and mechanical component physical damage.

Standard 11
Identify safety systems physical damage.

Standard 12
Identify interior component damage.

Standard 13
Identify damage to add-on accessories and modifications.

Standard 14
Identify single (one time) use components.

Performance Skill
Understand and perform damage analysis.
- Position the vehicle for inspection.
- Prepare vehicle for inspection by providing access to damaged areas.
- Analyze damage to determine appropriate methods for overall repairs.
- Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage.
- Gather details of the incident/accident necessary to determine the full extent of vehicle damage.
- Perform visual inspection of structural components and members.
- Identify structural damage using measuring tools and equipment.
- Perform visual inspection of non-structural components and members.
- Determine parts, components, material type(s) and procedures necessary for a proper repair.
- Identify suspension, electrical, and mechanical component physical damage.
• Identify safety systems physical damage.
• Identify interior component damage.
• Identify damage to add-on accessories and modifications.
• Identify single (one time) use components.

STRAND 9

Students will be able to understand and perform estimating.

Standard 1
Determine and record customer/vehicle owner information.

Standard 2
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.

Standard 3
Identify and record vehicle options, including trim level, paint code, transmission, accessories, and modifications.

Standard 4
Identify safety systems; determine replacement items.

Standard 5
Apply appropriate estimating and parts nomenclature (terminology).

Standard 6
Determine and apply appropriate estimating sequence.

Standard 7
Utilize estimating guide procedure pages.

Standard 8
Apply estimating guide footnotes and headnotes as needed.

Standard 9
Estimate labor value for operations requiring judgement.

Standard 10
Select appropriate labor value for each operation (structural, non-structural, mechanical, and refinish).

Standard 11
Select and price OEM parts; verify availability, compatibility, and condition.

Standard 12
Select and price alternative/optional OEM parts; verify availability, compatibility and condition.
Standard 13
Select and price aftermarket parts; verify availability, compatibility, and condition.

Standard 14
Select and price recyclable/used parts; verify availability, compatibility and condition.

Standard 15
Select and price remanufactured, rebuilt, and reconditioned parts; verify availability, compatibility and condition.

Standard 16
Determine price and source of necessary sublet operations.

Standard 17
Determine labor value, prices, charges, allowances, or fees for non-included operations and miscellaneous items.

Standard 18
Recognize and apply overlay deductions, included operations, and additions.

Standard 19
Determine additional material and charges.

Standard 20
Determine refinishing material and charges.

Standard 21
Apply math skills to establish charges and totals.

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

Standard 23
Identify procedural differences between computer-assisted systems and manually written estimates.

Standard 24
Identify procedures to restore corrosion protection; establish labor values, and material charges.

Standard 25
Determine the cost effectiveness of the repair and determine the approximate vehicle retail, and repair value.

Standard 26
Recognize the differences in estimation procedures when using different information provider systems.
Standard 27
Verify accuracy of estimate compared to the actual repair and replacement operations.

Performance Skill
Understand and perform estimating.

- 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.
- Identify safety systems; determine replacement items.
- Apply appropriate estimating and parts nomenclature (terminology).
- Determine and apply appropriate estimating sequence.
- Utilize estimating guide procedure pages.
- Apply estimating guide footnotes and headnotes as needed.
- Estimate labor value for operations requiring judgement.
- Select appropriate labor value for each operation (structural, non-structural, mechanical, and refinish).
- Select and price OEM parts; verify availability, compatibility, and condition.
- Select and price alternative/optional OEM parts; verify availability, compatibility and condition.
- Select and price aftermarket parts; verify availability, compatibility, and condition.
- Select and price recyclable/used parts; verify availability, compatibility and condition.
- Select and price remanufactured, rebuilt, and reconditioned parts; verify availability, compatibility and condition.
- Determine price and source of necessary sublet operations.
- Determine labor value, prices, charges, allowances, or fees for non-included operations and miscellaneous items.
- Recognize and apply overlay deductions, included operations, and additions.
- Determine additional material and charges.
- Determine refinishing material and charges.
- Apply math skills to establish charges and totals.
- Interpret computer-assisted and manually written estimates; verify the information is current.
- Identify procedural differences between computer-assisted systems and manually written estimates.
• Identify procedures to restore corrosion protection; establish labor values, and material charges.
• Determine the cost effectiveness of the repair and determine the approximate vehicle retail, and repair value.
• Recognize the differences in estimation procedures when using different information provider systems.
• Verify accuracy of estimate compared to the actual repair and replacement operations.

**STRAND 10**

*Students will be able to understand and perform customer relations and sales skills.*

**Standard 1**
Acknowledge and/or greet customer/client.

**Standard 2**
Listen to customer/client; collect information and identify customers/client's concerns, needs and expectations.

**Standard 3**
Establish cooperative attitude with customer/client.

**Standard 4**
Identify yourself to customer/client; offer assistance.

**Standard 5**
Deal with angry customer/client.

**Standard 6**
Identify customer/client preferred communication method; follow up to keep customer/client informed about parts and the repair process.

**Standard 7**
Recognize basic claims handling procedures; explain to customer/client.

**Standard 8**
Project positive attitude and professional appearance.

**Standard 9**
Provide and review warranty information.

**Standard 10**
Provide and review technical and consumer protection information.

**Standard 11**
Estimate and explain duration of out-of-service time.
Standard 12
Apply negotiation skills to obtain a mutual agreement.

Standard 13
Interpret and explain manual or computer-assisted estimate to customer/client.

Performance Skill
Understand and perform customer relations and sales skills.
- 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.
- Deal with angry customer/client.
- Identify customer/client preferred communication method; follow up to keep customer/client informed about parts and the repair process.
- Recognize basic claims handling procedures; explain to customer/client.
- Project positive attitude and professional appearance.
- 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.

STRAND 11
Students will understand the importance of career readiness skills as it relates to the workplace and outlined in the SkillsUSA Framework – Level 2.

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.