Auto Body Technology I

8676 36 weeks / 140 hours

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Acknowledgments

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Course Description

Suggested Grade Level: 10 or 11

In the global automobile collision repair industry, there is a growing demand for qualified auto body technicians. In this course, students are taught damage analysis, estimating, customer service, non-structural analysis, damage repair, and welding. Students work with a variety of materials, using metal finishing and body filling techniques to prepare surfaces and repair panels. Students who successfully complete this program sequence may be eligible to take the Automotive Service Excellence (ASE) Student Certification examinations.

Auto Body Technology I is closely aligned with the 2016 ASE Education Foundation collision repair and refinish program standards.
Note: Legislation enacted in the 2011 Virginia General Assembly (HB 1493) and amended in 2012 (HB 1108) requires where there is a national industry certification for career and technical education instructional personnel or programs for automotive technology, the Board of Education must make such certification mandatory. The provisions of this act shall become effective July 1, 2013. To comply with the requirements, all auto body technology programs must be ASE Education Foundation accredited and the instructors must be certified by the National Institute for ASE.

As noted in Superintendent's Memo #058-17 (2-28-2017), this Career and Technical Education (CTE) course must maintain a maximum pupil-to-teacher ratio of 20 students to one teacher, due to safety regulations. The 2016-2018 biennial budget waiver of the teacher-to-pupil ratio staffing requirement does not apply.

### Task Essentials Table

- Tasks/competencies designated by plus icons (+') in the left-hand column(s) are essential
- Tasks/competencies designated by empty-circle icons ('') are optional
- Tasks/competencies designated by minus icons ('−') are omitted
- Tasks marked with an asterisk (*) are sensitive.

<table>
<thead>
<tr>
<th>Task Number</th>
<th>8676</th>
<th>Tasks/Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safety Precaution</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>+</td>
<td>Select and use personal protective equipment (PPE); take necessary precautions with hazardous operations and materials in accordance with federal, state, and local regulations.</td>
</tr>
<tr>
<td>40</td>
<td>+</td>
<td>Identify procedures and precautions that may apply to the vehicle being repaired.</td>
</tr>
<tr>
<td>41</td>
<td>+</td>
<td>Identify vehicle system hazard types (supplemental restraint system [SRS], hybrid or electric or alternative fuel vehicles), locations, and recommended procedures before inspecting or replacing components.</td>
</tr>
<tr>
<td>42</td>
<td>+</td>
<td>Select and use a National Institute for Occupational Safety and Health (NIOSH)-approved air purifying respirator.</td>
</tr>
</tbody>
</table>

**Preparing for Non-Structural Analysis and Damage Repair**

<table>
<thead>
<tr>
<th>Task Number</th>
<th>43</th>
<th>Tasks/Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+</td>
<td>Pass an industry-specific safety exam.</td>
</tr>
<tr>
<td>Task Number</td>
<td>8676</td>
<td>Tasks/Competencies</td>
</tr>
<tr>
<td>-------------</td>
<td>------</td>
<td>-------------------</td>
</tr>
<tr>
<td>44</td>
<td></td>
<td>Review a damage report and analyze the damage to determine appropriate methods for overall repair; develop and document a repair plan.</td>
</tr>
<tr>
<td>45</td>
<td></td>
<td>Inspect, remove, label, store, and reinstall exterior trim and moldings.</td>
</tr>
<tr>
<td>46</td>
<td></td>
<td>Inspect, remove, label, store, and reinstall interior trim and components.</td>
</tr>
<tr>
<td>47</td>
<td></td>
<td>Inspect, remove, label, store, and reinstall body panels and components that may interfere with or be damaged during repair.</td>
</tr>
<tr>
<td>48</td>
<td></td>
<td>Inspect, remove, protect, label, store, and reinstall vehicle mechanical and electrical components that may interfere with or be damaged during repair.</td>
</tr>
<tr>
<td>49</td>
<td></td>
<td>Protect panels, glass, interior parts, and other vehicles adjacent to the repair area.</td>
</tr>
<tr>
<td>50</td>
<td></td>
<td>Soap and water wash the entire vehicle; complete a pre-repair inspection checklist.</td>
</tr>
<tr>
<td>51</td>
<td></td>
<td>Prepare the damaged area using water-based and solvent-based cleaners.</td>
</tr>
<tr>
<td>52</td>
<td></td>
<td>Remove corrosion protection, undercoating, sealers, and other protective coatings, as necessary, to perform repairs.</td>
</tr>
<tr>
<td>53</td>
<td></td>
<td>Inspect, remove, and reinstall repairable plastics and other components for off-vehicle repair.</td>
</tr>
<tr>
<td>54</td>
<td></td>
<td>Demonstrate the safe use and operation of tools common to the collision repair industry.</td>
</tr>
<tr>
<td>55</td>
<td></td>
<td>Explain vehicle parts, assemblies, and fasteners used in the collision repair industry.</td>
</tr>
</tbody>
</table>

**Repairing the Outer Body Panel**

<table>
<thead>
<tr>
<th>Task Number</th>
<th>8676</th>
<th>Tasks/Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td></td>
<td>Inspect or locate direct, indirect, or hidden damage and the direction of impact.</td>
</tr>
<tr>
<td>57</td>
<td></td>
<td>Inspect, remove, and replace a mechanically fastened, welded, steel panel or panel assemblies.</td>
</tr>
<tr>
<td><strong>Task Number</strong></td>
<td><strong>8676</strong></td>
<td><strong>Tasks/Competencies</strong></td>
</tr>
<tr>
<td>-----------------</td>
<td>----------</td>
<td>------------------------</td>
</tr>
<tr>
<td>58</td>
<td>☐</td>
<td>Determine the extent of damage to aluminum body panels; repair or replace.</td>
</tr>
<tr>
<td>59</td>
<td>✖️</td>
<td>Inspect, remove, replace, and align hood, hood hinges, and the hood latch.</td>
</tr>
<tr>
<td>60</td>
<td>✖️</td>
<td>Inspect, remove, replace, and align deck lid, lid hinges, and the lid latch.</td>
</tr>
<tr>
<td>61</td>
<td>✖️</td>
<td>Inspect, remove, replace, and align doors, latches, hinges, and related hardware.</td>
</tr>
<tr>
<td>62</td>
<td>✖️</td>
<td>Inspect, remove, replace, and align tailgates, hatches, liftgates, and sliding doors.</td>
</tr>
<tr>
<td>63</td>
<td>✖️</td>
<td>Inspect, remove, replace, and align bumpers, covers, reinforcements, guards, impact absorbers, and mounting hardware.</td>
</tr>
<tr>
<td>64</td>
<td>✖️</td>
<td>Inspect, remove, replace, and align fenders and related panels.</td>
</tr>
<tr>
<td>65</td>
<td>✖️</td>
<td>Straighten damaged panels for body filling or metal finishing.</td>
</tr>
<tr>
<td>66</td>
<td>✖️</td>
<td>Restore corrosion protection during and after the repair.</td>
</tr>
<tr>
<td>67</td>
<td>☐</td>
<td>Replace door skins.</td>
</tr>
<tr>
<td>68</td>
<td>✖️</td>
<td>Restore sound deadeners and foam materials.</td>
</tr>
<tr>
<td>69</td>
<td>✖️</td>
<td>Perform panel bonding and weld bonding.</td>
</tr>
<tr>
<td>70</td>
<td>✖️</td>
<td>Diagnose and repair water leaks, dust leaks, and wind noise.</td>
</tr>
<tr>
<td>71</td>
<td>✖️</td>
<td>Identify one-time-use fasteners.</td>
</tr>
<tr>
<td>72</td>
<td>✖️</td>
<td>Weld damaged or torn steel body panels; repair broken welds.</td>
</tr>
</tbody>
</table>

**Applying Metal Finishing and Body Filling**

<p>| 73 | ✖️ | Prepare a panel for body filler by abrading or removing the coatings; featheredge and refine scratches before the application of body filler. |</p>
<table>
<thead>
<tr>
<th>Task Number</th>
<th>8676</th>
<th>Tasks/Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>74</td>
<td>![ ]</td>
<td>Locate and repair surface irregularities on a damaged body panel using power tools, hand tools, and weld-on pulling attachments.</td>
</tr>
<tr>
<td>75</td>
<td>![ ]</td>
<td>Demonstrate hammer and dolly techniques.</td>
</tr>
<tr>
<td>76</td>
<td>![ ]</td>
<td>Heat-shrink stretched panel areas to proper contour.</td>
</tr>
<tr>
<td>77</td>
<td>![ ]</td>
<td>Cold-shrink stretched panel areas to proper contour.</td>
</tr>
<tr>
<td>78</td>
<td>![ ]</td>
<td>Identify body filler defects; correct the cause and condition (e.g., pinholing, ghosting, staining, over catalyzing, etc.).</td>
</tr>
<tr>
<td>79</td>
<td>![ ]</td>
<td>Identify different types of body fillers.</td>
</tr>
<tr>
<td>80</td>
<td>![ ]</td>
<td>Shape body filler to contour; finish sanding.</td>
</tr>
<tr>
<td>81</td>
<td>![ ]</td>
<td>Perform proper metal finishing techniques for aluminum.</td>
</tr>
<tr>
<td>82</td>
<td>![ ]</td>
<td>Perform proper application of body filler to aluminum.</td>
</tr>
<tr>
<td>83</td>
<td>![ ]</td>
<td>Straighten contours of damaged panels to a suitable condition for body fillings or metal finishing using power tools, hand tools, and weld-on pulling attachments.</td>
</tr>
</tbody>
</table>

**Repairing Moveable Glass and Hardware**

<table>
<thead>
<tr>
<th>Task Number</th>
<th>84</th>
<th>Tasks/Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>![ ]</td>
<td>Inspect, adjust, repair, or replace window regulators, run channels, glass, power mechanisms, and related controls.</td>
</tr>
<tr>
<td>85</td>
<td>![ ]</td>
<td>Inspect, adjust, repair, remove, reinstall, or replace weather-stripping.</td>
</tr>
<tr>
<td>86</td>
<td>![ ]</td>
<td>Inspect, repair, or replace, and adjust removable power-operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs.</td>
</tr>
<tr>
<td>87</td>
<td>![ ]</td>
<td>Inspect, remove, reinstall, and align a convertible top and related mechanisms.</td>
</tr>
<tr>
<td>88</td>
<td>![ ]</td>
<td>Initialize electrical components as needed.</td>
</tr>
<tr>
<td>Task Number</td>
<td>8676</td>
<td>Tasks/Competencies</td>
</tr>
<tr>
<td>-------------</td>
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</tr>
<tr>
<td><strong>Practicing Metal Welding and Cutting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>89</td>
<td>+</td>
<td>Identify the considerations for cutting, removing, and welding various types of steel, aluminum, and other metals.</td>
</tr>
<tr>
<td>90</td>
<td>+</td>
<td>Explain procedures for welding high-strength steel and other steels.</td>
</tr>
<tr>
<td>91</td>
<td></td>
<td>Explain the procedures for welding aluminum.</td>
</tr>
<tr>
<td>92</td>
<td>+</td>
<td>Determine the correct gas metal arc welding (GMAW) welder type.</td>
</tr>
<tr>
<td>93</td>
<td>+</td>
<td>Set up and attach a work clamp (i.e., ground), and adjust the GMAW welder to &quot;tune&quot; for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the substrate being welded.</td>
</tr>
<tr>
<td>94</td>
<td>+</td>
<td>Store, handle, and install high-pressure gas cylinders; test for leaks.</td>
</tr>
<tr>
<td>95</td>
<td>+</td>
<td>Determine the proper angle of the gun to the joint and direction of gun travel for the type of weld being made.</td>
</tr>
<tr>
<td>96</td>
<td>+</td>
<td>Protect adjacent panels, glass, and vehicle interior from welding and cutting operations.</td>
</tr>
<tr>
<td>97</td>
<td>+</td>
<td>Protect computers and other electronics and wires during welding procedures.</td>
</tr>
<tr>
<td>98</td>
<td>+</td>
<td>Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp or tack, as required.</td>
</tr>
<tr>
<td>99</td>
<td>+</td>
<td>Determine the joint type (e.g., butt weld with backing, lap) for the weld being made.</td>
</tr>
<tr>
<td>100</td>
<td>+</td>
<td>Determine the type of weld (e.g., continuous, stitch weld, plug, etc.) for each specific welding operation.</td>
</tr>
<tr>
<td>101</td>
<td>+</td>
<td>Perform welds (e.g., plug, butt weld with and without backing, and fillet) in the flat, horizontal, vertical, and overhead positions.</td>
</tr>
<tr>
<td>102</td>
<td>+</td>
<td>Perform a visual evaluation and destructive test on each weld type.</td>
</tr>
<tr>
<td>103</td>
<td>+</td>
<td>Identify the causes of various welding defects; make necessary adjustments.</td>
</tr>
<tr>
<td>Task Number</td>
<td>Tasks/Competencies</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------</td>
<td></td>
</tr>
<tr>
<td>104</td>
<td><strong>8676</strong> Identify the cause of contact, tip burn-back, and failure of the wire to feed; make necessary adjustments.</td>
<td></td>
</tr>
<tr>
<td>105</td>
<td>Identify the cutting process for different substrates and locations; perform the cutting operation.</td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>Identify different methods of attaching structural components.</td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>Working with Plastics and Adhesives Identify the types of plastics and their potential for repair.</td>
<td></td>
</tr>
<tr>
<td>108</td>
<td>Identify the types of plastic repair procedures.</td>
<td></td>
</tr>
<tr>
<td>109</td>
<td>Replace or repair rigid, semi-rigid, and flexible plastic panels.</td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>Remove or repair damaged areas from rigid exterior composite panels.</td>
<td></td>
</tr>
<tr>
<td>111</td>
<td>Replace bonded rigid exterior composite body panels; straighten or align panel supports.</td>
<td></td>
</tr>
<tr>
<td>112</td>
<td>Preparing for a Career in Auto Body Repair Research opportunities in the auto body repair field.</td>
<td></td>
</tr>
<tr>
<td>113</td>
<td>Prepare a portfolio of current skills.</td>
<td></td>
</tr>
<tr>
<td>114</td>
<td>Identify the basic construction of the auto body.</td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>Identify ASE areas of certification.</td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>Create a written estimate of repairs.</td>
<td></td>
</tr>
</tbody>
</table>

Legend: ☑Essential ☐Non-essential ☐Omitted

**Curriculum Framework**
Safety Precaution

Task Number 39

Select and use personal protective equipment (PPE); take necessary precautions with hazardous operations and materials in accordance with federal, state, and local regulations.

Definition

Procedures should include the following:

- Identifying government agencies regulating the auto body repair industry.
- Practicing general safety rules.
- Using PPE.
- Demonstrating fire emergency procedures, including proper use of fire protection equipment.
- Using chemicals safely.
- Identifying environmental effects of chemicals.
- Using proper chemical disposal techniques.
- Explaining and discussing information on safety data sheets (SDS).
- Identifying toxic substances and considerations in handling them.
- Using electrical safety procedures (including those related to the air bag and battery).
- Identifying safe under-hood practices.

Process/Skill Questions

- How can mishandling hazardous materials affect safety?
- What effect can hazardous materials have on the environment?
- Why are proper disposal procedures important to an auto body business owner?
Task Number 40

Identify procedures and precautions that may apply to the vehicle being repaired.

Definition

Identification should include following manufacturer’s warning and guidelines regarding procedures and precautions.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
A. Safety Precautions
Task 2

Process/Skill Questions

- Where are the procedures for the repair process located?
- How is a plan to implement procedures developed?
- How would one document that proper procedures were followed?

Task Number 41

Identify vehicle system hazard types (supplemental restraint system [SRS], hybrid or electric or alternative fuel vehicles), locations, and recommended procedures before inspecting or replacing components.

Definition

Identification should include following manufacturer’s warning and guidelines regarding procedures and precautions.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
A. Safety Precautions
Task 3
Process/Skill Questions

• How are safety systems described?
• What are the hazards of working with the safety systems?
• Where is the information on determining the location of the safety components found?

Task Number 42

Select and use a National Institute for Occupational Safety and Health (NIOSH)-approved air purifying respirator.

Definition

Procedures should include

• inspecting the condition of the respirator
• ensuring the fit and operation
• performing proper maintenance in accordance with OSHA regulations and applicable state and local regulations.

Preparing for Non-Structural Analysis and Damage Repair
Task Number 43

Pass an industry-specific safety exam.

Definition

Student must pass an industry-specific safety exam.

Process/Skill Questions

• What are the repercussions of unsafe working habits?
• What is the difference between personal safety requirements and lab safety requirements?
• What are government agencies that enforce safety in the auto body field?

Common Career Technical Core

TD4
Identify governmental policies and procedures for transportation, distribution and logistics facilities.

TD5
Describe transportation, distribution and logistics employee rights and responsibilities and employers’ obligations concerning occupational safety and health.

Task Number 44

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

Definition

Review should include

• determining the locations of all suspension, steering, and power train component-attaching points on the body
• determining the extent of the direct and indirect damage and the direction of impact; planning the methods and sequence of repair
• determining the extent of damage to structural steel body panels; developing a plan for repairing or replacing the damage
• reviewing the damage report and analyzing it to determine the appropriate methods for overall repair; developing a repair plan
• determining the extent of direct and indirect damage and direction of impact on various substrates; developing a repair plan.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
B. Preparation
Task 1

Process/Skill Questions

• Why is it a good idea to make a repair plan?
• How is the point of impact determined?
• What are some examples and evidence of direct and indirect impacts?

Task Number 45

Inspect, remove, label, store, and reinstall exterior trim and moldings.

Definition

Procedures should include

• removing, storing, and replacing exterior trim and moldings
• locating and drilling holes for new molding and trim
• proper storage.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
B. Preparation
Task 2

Process/Skill Questions

• What is a release agent for an adhesive trim?
• How are headlights attached to a radiator support?
• How are door molding clips attached to a door skin?
Task Number 46

Inspect, remove, label, store, and reinstall interior trim and components.

Definition

Procedures should include

- inspecting and removing interior components and trim
- replacing interior trim and components
- proper storage.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
B. Preparation
Task 3

Process/Skill Questions

- What is the purpose of a door trim panel?
- What type of bolts retain a seat belt mechanism?
- What is the advantage of using a Torx-head screw rather than a Phillips-head screw?

Task Number 47

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

Definition

Procedures should include

- protecting panels and parts adjacent to the repair area
- checking and aligning front fenders, headers, and other panels
• inspecting, removing, and replacing bolted, bonded, and welded steel panel or panel assemblies
• inspecting, removing, replacing, and aligning the hood, hood hinges, and the hood latch
• inspecting, removing, replacing, and aligning the deck lid, lid hinges, and the lid latch
• inspecting, removing, replacing, and aligning the doors, tailgates, hatches, lift gates, latches, hinges, and related hardware.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
B. Preparation
Task 4

Process/Skill Questions

• Why is it important to maintain a positive fender-to-door flushness?
• What is the importance of the upper and lower door-hinge adjustments?
• When working with bolt-on panels, what panel is the point of reference?

Task Number 48

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

Definition

Procedures should include

• inspecting, testing, and replacing fusible links, circuit breakers, and fuses
• identifying programmable electrical/electronic components; recording data for reprogramming before disconnecting a battery
• demonstrating the proper self-grounding procedures for handling electrical components
• removing and replacing head lamp or light, parking or tail lamp or light, stop lamp or light, flashers, turn signals, and backup lamp or light; checking operation
• inspecting, testing, and repairing or replacing switches, relays, bulbs, sockets, connectors, and wires of all light circuits, including four-wire tail lamp or light systems
• inspecting, replacing, and aiming head lamp or light bulbs
• properly protecting an exposed connector.
II. Non-Structural Analysis and Damage Repair (Body Components)
B. Preparation
Task 5

Process/Skill Questions

- What mechanical and electrical belt components are driven by the serpentine?
- How is radiator coolant handled safely?
- How often should component reservoir tanks (plastic) be replaced?

---

Task Number 49

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

Definition

Protection should include

- determining whether to remove or mask trim
- allowing space for paint buildup
- selecting type and width of masking tape or paper
- considering pressure-sensitive tapes when working on fresh paint or sharp edges
- considering high-quality masking paper for two-tone painting (e.g., to avoid bleed-through)
- applying tape by stretching and pleating it in sharp curves
- protecting glass from welding splatter
- removing and replacing fixed glass (i.e., heated and non-heated)
- removing and replacing modular glass.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
B. Preparation
Task 6

Process/Skill Questions

- Why is it inadvisable to use a pry bar to remove undamaged panels during disassembly?
- What precautions should be taken before using the grinder adjacent to the windshield?
- What are the considerations in the removal of the hood panel?
Task Number 50

Soap and water wash the entire vehicle; complete a pre-repair inspection checklist.

Definition

Washing should include

- using proper chemicals
- using proper techniques
- checking for related and unrelated damage to the repair area.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
B. Preparation
Task 7

Process/Skill Questions

- What chemicals should be used, and can organic or nonorganic material be used?
- How is related and nonrelated damage determined?
- How is related and unrelated damage documented?

Task Number 51

Prepare the damaged area using water-based and solvent-based cleaners.

Definition

Procedures should include washing an entire vehicle to remove dirt, grease, wax, or protective coatings from the area to be refinished and adjacent vehicle surfaces. Steps should include

- applying silicone-free soap and water wash
- applying volatile organic compounds (VOC)-compliant solvent cleaner according to manufacturer's specifications for vehicle finish
- wiping the surface area with clean cloths or towels.
Task Number 52

**Remove corrosion protection, undercoating, sealers, and other protective coatings, as necessary, to perform repairs.**

**Definition**

Procedures should include various methods for removing corrosion protection materials (e.g., grinding, sanding, using a wire wheel or brush, using a heat gun) according to manufacturer’s specifications.

**Process/Skill Questions**

- What are some indications of possibly damaged corrosion protection?
- What are some concerns when using heat to remove undercoatings?
- When applying corrosion protection to a repaired area, what preventative measures should be taken to protect adjacent areas?

Task Number 53
Inspect, remove, and reinstall repairable plastics and other components for off-vehicle repair.

Definition

Procedures should include

- identifying the types of composites to be repaired (e.g., urethane bumpers, filler panels)
- identifying the types of composite-repair procedures
- cleaning and repairing the surface of composite parts
- using plastic welder.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
B. Preparation
Task 10

Process/Skill Questions

- What parts comprise the basic plastic bumper system?
- What is the purpose of taping undamaged parts when reinstalling repaired plastic parts onto a vehicle?
- What should be done with damaged plastic fasteners?

Task Number 54

Demonstrate the safe use and operation of tools common to the collision repair industry.

Definition

Demonstration should include identifying and using or operating basic hand tools and power tools appropriate for the task, according to manufacturer and safety specifications.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
B. Preparation
Task 11
Process/Skill Questions

- What are some hand tools common to the collision repair industry?
- What are some power tools common to the collision repair industry?
- Why is it important to know the correct names of various tools?

Task Number 55

Explain vehicle parts, assemblies, and fasteners used in the collision repair industry.

Definition

Explanation should include identifying and describing the purpose(s) of vehicle parts, assemblies, and fasteners used in the collision repair industry.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
B. Preparation
Task 12

Process/Skill Questions

- What are some of the vehicle parts, assemblies, and fasteners used in the collision repair industry?
- What are the purposes of the vehicle parts, assemblies, and fasteners?
- Why is it important to know the purposes of various vehicle parts, assemblies, and fasteners?

Repairing the Outer Body Panel

Task Number 56
Inspect or locate direct, indirect, or hidden damage and the direction of impact.

Definition

Inspection should include examining to

- determine the point of impact
- remove parts to access hidden damage.

Task Number 57

Inspect, remove, and replace a mechanically fastened, welded, steel panel or panel assemblies.

Definition

Inspection should include following manufacturer’s guidelines and specifications.
Task Number 58

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

Definition

Determination should include following manufacturer’s guidelines and specifications.

Process/Skill Questions

- How does one determine whether the body panel is aluminum?
- What safety precautions should be taken when repairing aluminum?

Task Number 59

Inspect, remove, replace, and align hood, hood hinges, and the hood latch.

Definition

Procedures should include

- inspecting, removing, and replacing the bolted panel or panel assemblies
- inspecting and removing the hood and related hardware (e.g., washer nozzles, insulator, hood light)
- replacing and aligning the hood, hood hinges, hood latches, and related hardware.
Process/Skill Questions

- Why should the hood be raised and lowered slowly during the damage analysis process?
- What action should one take if a hinge pin or bushing is found to be damaged?
- Why is it important to ensure the hood is properly supported?

Task Number 60

Inspect, remove, replace, and align deck lid, lid hinges, and the lid latch.

Definition

Procedures should include

- inspecting, removing, and replacing a bolted panel or panel assemblies
- inspecting and removing a deck lid, hatch, tailgate, and related hardware (e.g., washer nozzles, insulator, lights)
- replacing or installing and aligning a deck lid, hatch, tailgate, and related hardware
- diagnosing and repairing water leaks, dust leaks, and wind noise.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
C. Off-Vehicle Transmission and Transaxle
Task 5

Process/Skill Questions

- How should small bends in the deck lid hinge arms be treated?
- What operation should be completed to alleviate a sticking deck lid latch?
- With which panels should the deck lid be in horizontal alignment during repair or replacement?

Task Number 61

Inspect, remove, replace, and align doors, latches, hinges, and related hardware.
Definition

Procedures should include

- inspecting and removing doors, hinges, and related hardware
- replacing or installing and aligning doors, hinges, and related hardware
- diagnosing and repairing water leaks, dust leaks, and wind noise.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
C. Off-Vehicle Transmission and Transaxle
Task 6

Process/Skill Questions

- What is the purpose of the door hinge?
- Why is proper door alignment necessary?
- What is the proper procedure for door replacement?

Task Number 62

Inspect, remove, replace, and align tailgates, hatches, liftgates, and sliding doors.

Definition

Inspection should include following manufacturer’s guidelines and specifications.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
C. Off-Vehicle Transmission and Transaxle
Task 7

Process/Skill Questions

- What is a tailgate?
- What is a liftgate?
- Why is proper alignment necessary?
Task Number 63

Inspect, remove, replace, and align bumpers, covers, reinforcements, guards, impact absorbers, and mounting hardware.

Definition

Procedures should include

- inspecting, removing, and replacing bolted panel or panel assemblies
- inspecting and removing bumper bars, covers, reinforcement guards, isolators, and mounting hardware
- replacing or installing and aligning bumper bars, covers, reinforcement guards, isolators, and mounting hardware.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
C. Off-Vehicle Transmission and Transaxle
Task 8

Process/Skill Questions

- What is the bumper reinforcement designed to do?
- How many labor hours are required to remove the bumper reinforcement?
- What are reasons to remove and inspect the bumper isolator?

Task Number 64

Inspect, remove, replace, and align fenders and related panels.

Definition

Procedures should include

- inspecting and removing front fenders, headers, and other panels
- replacing or installing and aligning front fenders, headers, and other panels
- diagnosing and repairing dust leaks and wind noise.
II. Non-Structural Analysis and Damage Repair (Body Components)
C. Off-Vehicle Transmission and Transaxle

Task 9

Process/Skill Questions

- What is the function of the header panel?
- How is a fender-to-door combination aligned?
- How is a plasma cutter used to remove a quarter panel?

Task Number 65

Straighten damaged panels for body filling or metal finishing.

Definition

Procedures should include

- straightening and roughing-out contours of a damaged panel to a surface condition for body filling or metal finishing, using power tools, hand tools, and a stud welder
- removing all rust, paint, and dirt, using a suitable grit for the filler products to be used.

Process/Skill Questions

- What tools are used to metal-finish a damaged panel?
- How is a stud welder used to pull a dent?
- What is the procedure for metal-finishing a damaged panel?

Task Number 66

 Restore corrosion protection during and after the repair.

Definition

Procedures should include
• restoring corrosion protection to repaired or replaced frame areas, unibody structural areas, and outer body panels
• restoring corrosion-resistant coatings, caulking, and seam sealers to other repaired areas.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
C. Off-Vehicle Transmission and Transaxle
Task 10

Process/Skill Questions

• What is the purpose of corrosion protection?
• What are original equipment manufacturer (OEM) specifications, and what bearing do they have on the application of corrosion protection?
• What precautions should one take when applying corrosion protection?

Task Number 67

Replace door skins.

Definition

Replacement should include procedures for

• protecting panels and parts adjacent to the repair area
• inspecting, removing, and replacing bolted, bonded, and welded steel panel or panel assemblies
• replacing door skins according to manufacturer’s specifications and guidelines.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
C. Off-Vehicle Transmission and Transaxle
Task 11

Process/Skill Questions

• How are door skins typically reattached? Are there alternatives?
• What are the names of two types of bonding adhesives?
• Why should the glass be removed from a door when using the welding method to replace a skin?
Task Number 68

Restore sound deadeners and foam materials.

Definition

Restoration should include

- determining the material
- replacing according to OEM specifications.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
C. Off-Vehicle Transmission and Transaxle
Task 12

Process/Skill Questions

- What is the purpose of sound deadeners?
- Why are foam filling materials used in a pillow?
- What should happen to foam materials before welding? Why?

Task Number 69

Perform panel bonding and weld bonding.

Definition

Procedures should include

- determining bonding material to meet OEM specifications and manufacturer specifications
- following manufacturer’s specifications and guidelines.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
C. Off-Vehicle Transmission and Transaxle
Task 13
Process/Skill Questions

- When can bonding materials be substituted for metal inert gas (MIG) welding?
- What is the total curing time of panel bonding adhesives?
- Why are bonding materials more efficient than MIG welding?

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Task Number 70

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

Definition

Procedures should include

- inspecting seals and weather stripping
- checking for panel alignment
- applying seam sealers.

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2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
C. Off-Vehicle Transmission and Transaxle
Task 14

Process/Skill Questions

- What is the best way to determine whether one has a water leak?
- What defects does one look for in the seals and weather strips?
- How does one determine whether the problem is a wind noise or a wind rush?

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Task Number 71

Identify one-time-use fasteners.

Definition

Procedures should include

- identifying proper removal and replacement of the fastener
- following manufacturer’s specifications and guidelines.
**Task Number 72**

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

**Definition**

Procedures should include following manufacturer’s specifications and guidelines.

**Process/Skill Questions**

- How is the type of material identified?
- How does one determine whether the damage can be repaired?

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**Applying Metal Finishing and Body Filling**

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**Task Number 73**
Prepare a panel for body filler by abrading or removing the coatings; featheredge and refine scratches before the application of body filler.

Definition

Procedures should include

- removing all rust, paint, and dirt, using appropriate grit
- cleaning the area, using an appropriate solvent
- applying suitable metal treatment or primer.

In the case of substrate composition, the vehicle manufacturer’s or supplier’s recommendations will determine the procedure for removing paint.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
D. Metal Finishing and Body Filling
Task 1

Process/Skill Questions

- What grit grinding disc is used to remove paint from a damaged body panel?
- Why is paint removal necessary for dent repair?
- When painting a damaged panel, when should metalwork be completed? Why?

Task Number 74

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

Definition

Procedures should include

- removing creases and dents, using power tools and hand tools to restore damaged areas to proper contours and dimensions
- straightening and roughing-out contours of a damaged panel to a surface condition for body filling or metal finishing, using power tools, hand tools, and a stud welder.

ASE Education Foundation  
2016 Collision Master Task List  
II. Non-Structural Analysis and Damage Repair (Body Components)  
D. Metal Finishing and Body Filling  
Task 2

Process/Skill Questions

- What are some common surface irregularities?
- How are surface irregularities located?
- What safety precautions should be used to reduce surface irregularities?

Task Number 75

Demonstrate hammer and dolly techniques.

Definition

Demonstration includes the selection of an appropriate hammer and dolly according to the damage and contour of the panel to be repaired.

ASE Education Foundation  
2016 Collision Master Task List  
II. Non-Structural Analysis and Damage Repair (Body Components)  
D. Metal Finishing and Body Filling  
Task 3

Process/Skill Questions

- What are the names of body hammers?
- What are the names of dollies?
- When are hammers and dollies used?

Task Number 76

Heat-shrink stretched panel areas to proper contour.
**Definition**

Procedures should include

- using proper heat-stress relief methods in high-strength steel
- heat-shrinking stretched panel areas to proper contour.

**Task Number 77**

**Cold-shrink stretched panel areas to proper contour.**

**Definition**

Procedures should include

- using proper tools and techniques to shrink back to the proper contour
- using proper cold-stress relief methods.

**ASE Education Foundation**

2016 Collision Master Task List

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

D. Metal Finishing and Body Filling

Task 5

**Process/Skill Questions**

- What are the tools required to cold-shrink a panel?
- How does one cold-shrink substrate?
Task Number 78

Identify body filler defects; correct the cause and condition (e.g., pinholing, ghosting, staining, over catalyzing, etc.).

Definition

Procedures should include mixing body filler according to manufacturer's recommendations and guidelines.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
D. Metal Finishing and Body Filling
Task 6

Process/Skill Questions

- Why are the manufacturer's recommendations important when mixing body filler?
- What safety precautions must be followed when mixing body filler?
- How do temperature and humidity affect mixing?

Task Number 79

Identify different types of body fillers.

Definition

Procedures include application of body filler and surform filing during curing.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
D. Metal Finishing and Body Filling
Task 7

Process/Skill Questions

- What tools are used to mix and apply body filler?
- What tools and equipment are used to shape body filler?
- What are the safety precautions used when applying body filler?
Task Number 80

Shape body filler to contour; finish sanding.

Definition

Procedures should include rough-sanding cured body filler to correct contour and finish-sanding.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
D. Metal Finishing and Body Filling
Task 8

Process/Skill Questions

• What grit sandpaper is recommended for rough sanding?
• What grit sandpaper is recommended for finish sanding?
• Is wet sanding for body filler recommended? Why?

Task Number 81

Perform proper metal finishing techniques for aluminum.

Definition

Performance should include

• using tools and techniques needed
• identifying safety aspects.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
D. Metal Finishing and Body Filling
Task 10

Process/Skill Questions

• What tools are needed to complete the task?
How does cross-contamination affect the repaired area?

Task Number 82
Perform proper application of body filler to aluminum.

Definition
Performance should include following manufacturer’s specifications and guidelines.

Task Number 83
Straighten contours of damaged panels to a suitable condition for body fillings or metal finishing using power tools, hand tools, and weld-on pulling attachments.

Definition
Procedures should include

- following procedures for straightening metal
- identifying the appropriate tool for the job
- identifying reasons for selecting a lighter-grade grit than would be used on steel on a grinding disc.
D. Metal Finishing and Body Filling
Task 11

Process/Skill Questions

- What tools should be used to straighten aluminum, as compared to steel?
- How does over-heating affect aluminum?
- Why use a lighter-grade grit for aluminum than for steel?

Repairing Moveable Glass and Hardware

Task Number 84

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

Definition

Procedures should include

- inspecting, adjusting, repairing, or replacing window regulators, run channels, glass, power mechanisms, and related controls
- inspecting, repairing, or replacing power-driven accessories, and related controls (including electrically heated glass)
- removing and replacing components of electric door and hatch or trunk lock, and checking the operation
- removing and replacing components of keyless lock or unlock devices and alarm systems, and checking the operation
- checking the operation of power side windows and the power tailgate window
- diagnosing and repairing water leaks, dust leaks, and wind noises, and inspecting, repairing, and replacing weather stripping.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
E. Moveable Glass and Hardware
Task 1
Process/Skill Questions

- What is the purpose of the window regulator?
- Which components need electrical power?
- Which component of the power window system is the most problematic? Why?

Task Number 85

Inspect, adjust, repair, remove, reinstall, or replace weather-stripping.

Definition

Procedures should include following manufacturer’s specifications and guidelines.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
E. Moveable Glass and Hardware
Task 2

Process/Skill Questions

- How is weather stripping installed?
- How is the panel to install new weather stripping prepared?

Task Number 86

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

Definition

Procedures should include

- inspecting, repairing, or replacing removable manually operated roof panel
- inspecting, repairing, or replacing removable power-operated roof panel
• checking tracks or channels
• checking fuses, switches, and other electrical components (in power-operated panels).

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
E. Moveable Glass and Hardware
Task 3

Process/Skill Questions

• What adjustments can be made on guides?
• What are some vehicle models that have sunroofs that are not power-operated?
• Where can a hinge repair kit be found?
• When would hinge repair be a good option?

Task Number 87

Inspect, remove, reinstall, and align a convertible top and related mechanisms.

Definition

Procedures should include

• inspecting roof bows and rails
• reinforcing tears with backing patch
• removing the rear seat and trim to access manually operated convertible-top hardware
• checking drive cables on electrically operated convertible top and lubricating, if needed
• checking for dirty or damaged cables on an electrically operated convertible top
• checking switches and for fluid leaks on a hydraulically operated convertible top.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
E. Moveable Glass and Hardware
Task 4

Process/Skill Questions

• What is a tack strip?
• What are some vehicle models that have manually operated convertible tops?
• What automaker had a metal top on one of its convertibles that detached, folded, and stored in the trunk?

Task Number 88

Initialize electrical components as needed.

Definition

Initialization should include following manufacturer guidelines to determine the necessary action.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
E. Moveable Glass and Hardware
Task 5

Process/Skill Questions

• What is the importance of proper initialization?
• How can electrical components be damaged during initialization?

Practicing Metal Welding and Cutting

Task Number 89

Identify the considerations for cutting, removing, and welding various types of steel, aluminum, and other metals.

Definition

Identification includes
• weldables (i.e., some composites, steel, and aluminum [metals])
• non-weldables (i.e., some composites [carbon fiber, fiberglass], glass, and rubber)

ASE Education Foundation
2016 Collision Master Task List
VI. Welding, Cutting, and Joining
B. Metal Welding, Cutting, and Joining
Task 1

Process/Skill Questions

• What are three weldable metals?
• How can two dissimilar metals be welded together?
• What type of weld is recommended to replace factory spot welds?

Task Number 90

Explain procedures for welding high-strength steel and other steels.

Definition

Explanation should include procedures for

• welding and cutting high-strength steel and other metals (such as low-carbon steel), using manufacturer’s procedures
• determining the correct welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation
• setting up welding equipment
• adjusting the welder to “tune” for proper electrode stick-out, voltage, polarity, flow rate, and wire-feed speed required for the material being welded
• storing, handling, and installing high-pressure gas cylinders
• determining the work clamp (e.g., ground) location and attaching
• using the proper angle of the gun to the joint and the direction of the gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions
• identifying the causes of spits and sputters, burn-through, lack of penetration, porosity, incomplete fusion, excessive spatter, distortion, and waviness of bead and making necessary adjustments
• identifying cause of contact, tip burn-back, and failure of the wire to feed, and making necessary adjustments.

Process/Skill Questions
• What are the alternatives for cutting high-strength steel without damage to structural integrity?
• What is the maximum temperature for MIG welding high-strength low-alloy (HSLA) steel?
• What is used to determine metal temperature when welding?

Task Number 91

Explain the procedures for welding aluminum.

Definition
Explanation should include the procedures for

• determining the correct welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation
• setting up welding equipment
• adjusting the welder to “tune” for proper electrode stick-out, voltage, polarity, flow rate, and wire-feed speed required for the material being welded
• storing, handling, and installing high-pressure gas cylinders
• determining the work clamp (e.g., ground) location and attaching.

Process/Skill Questions

• What are the alternative methods to cut aluminum?
• What types of welders are used for welding aluminum?
• What shielding gas is used for MIG welding aluminum?

Task Number 92

Determine the correct gas metal arc welding (GMAW) welder type.

Definition

Determination should include the

• electrode
• wire type
• diameter
• gas

to be used in a specific welding situation.

ASE Education Foundation
2016 Collision Master Task List
VI. Welding, Cutting, and Joining
B. Metal Welding, Cutting, and Joining
Task 2

Process/Skill Questions

• What are common wire sizes for MIG welding in the auto body lab?
• What gases are available for steel welding?
• What is a spool gun, and what is its function?

Task Number 93

Set up and attach a work clamp (i.e., ground), and adjust the GMAW welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the substrate being welded.

Definition

Procedures should include

• determining the correct welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation
• setting up welding equipment
• adjusting the welder to “tune” for proper electrode stick-out, voltage, polarity, flow rate, and wire-feed speed required for the material being welded
• determining the work clamp (e.g., ground) location and attaching.
Process/Skill Questions

- What is the line pressure for shielding when welding steel?
- When increasing amperage, what else needs to be increased? Why?
- What is the proper angle of the gun to the metal?

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**Task Number 94**

**Store, handle, and install high-pressure gas cylinders; test for leaks.**

**Definition**

Procedures should include

- knowing the off and on procedures
- knowing the pressure forces
- knowing the storage procedures (e.g., keeping the cap on)
- testing for leaks.

ASE Education Foundation
2016 Collision Master Task List
VI. Welding, Cutting, and Joining
B. Metal Welding, Cutting, and Joining
Task 4

**Process/Skill Questions**

- How are high-pressure cylinders stored safely?
- What is the purpose of keeping caps on cylinders?
- Should cylinders be stored vertically or horizontally? Why?

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**Task Number 95**

**Determine the proper angle of the gun to the joint and direction of gun travel for the type of weld being made.**

**Definition**
Determination should include welds such as

- flat
- horizontal
- vertical
- overhead.

ASE Education Foundation
2016 Collision Master Task List
VI. Welding, Cutting, and Joining
B. Metal Welding, Cutting, and Joining
Task 5

Process/Skill Questions

- How should the welder setup change when welding in the overhead position?
- Where should the weld begin the weld on a patch in quarter?
- Which of the position welds is easiest to perform?

Task Number 96

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

Definition

Protection should include

- using spark deflection paper
- using welding aprons and blankets.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
D. Metal Finishing and Body Filling
Task 6

Process/Skill Questions

- Which company makes a protective coated paper to protect from weld spatter?
- What other materials are available for protection against weld damage?
- What should be done to protect the interior when replacing a roof panel?
Task Number 97

Protect computers and other electronics and wires during welding procedures.

Definition

Protection should include disconnecting, separating positive and negative battery terminals, or removing a battery.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
D. Metal Finishing and Body Filling
Task 8

Process/Skill Questions

- What should be done to protect electronic components when welding? Why are electronics vulnerable to damage?
- What problems can be encountered when disconnecting battery cables?
- What is available to alleviate problems associated with disconnecting battery cables?

Task Number 98

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

Definition

Procedures should include

- cleaning and otherwise preparing the metal for welding
- fitting, aligning, and clamping, as required.

ASE Education Foundation
2016 Collision Master Task List
VI. Welding, Cutting, and Joining
B. Metal Welding, Cutting, and Joining
Task 9

Process/Skill Questions

- How is aluminum prepared for welding?
- What can be added to steel to prepare it for welding?
- What can one use to check the temperature of aluminum while welding?
- What is the melting point of mild (i.e., low-carbon) steel?

Task Number 99

Determine the joint type (e.g., butt weld with backing, lap) for the weld being made.

Definition

Determination should include:

- square butt joint (i.e., butt weld with backing)
- lap joint
- T-joint.

ASE Education Foundation
2016 Collision Master Task List
VI. Welding, Cutting, and Joining
B. Metal Welding, Cutting, and Joining
Task 10

Process/Skill Questions

- What type of weld is preferred for a panel replacement?
- What procedure is used in panel-replacement welding?
- What type of weld or welding requires backing?

Task Number 100
Determine the type of weld (e.g., continuous, stitch weld, plug, etc.) for each specific welding operation.

Definition

Determination should be based upon following manufacturer guidelines and include

- continuous
- plug
- stitch
- tack
- spot.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
D. Metal Finishing and Body Filling
Task 11

Process/Skill Questions

- What type of weld could be used for making a patch?
- What are the differences between continuous welds, butt welds, and plug welds?
- What is a backing?

Task Number 101

Perform welds (e.g., plug, butt weld with and without backing, and fillet) in the flat, horizontal, vertical, and overhead positions.

Definition

Procedures should include

- determining the joint type (e.g., reinforced-butt, lap) for the weld, according to manufacturer's or industry specifications
- determining the type of weld (i.e., continuous, reinforced-butt, plug) for each specific welding operation, according to manufacturer’s/industry specifications
- performing welds, such as
  - continuous
- stitch
- tack
- plug
- spot
- reinforced-butt
- lap joints.

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2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
D. Metal Finishing and Body Filling
Task 12

Process/Skill Questions

- What procedure is used to perform a stitch weld?
- What procedure is used to perform a butt weld?
- What is the purpose of a tack weld?

---

Task Number 102

Perform a visual evaluation and destructive test on each weld type.

Definition

Procedures should include performing destructive tests on each weld type (e.g., butt welds, lap and flange welds, plug welds, spot welds, stitches).

Destructive testing should include the following steps:

1. Clamp the base metal to the table.
2. Apply force (e.g., with a chisel) until the metal or weld breaks.
3. Ascertain the quality of weld. If part of the metal tears off with weld, the fusion is complete. If the metal separates from the weld cleanly, the weld is too weak.

ASE Education Foundation
2016 Collision Master Task List
VI. Welding, Cutting, and Joining
B. Metal Welding, Cutting, and Joining
Task 13
Process/Skill Questions

- What is a destructive test?
- How is a destructive test performed?
- What is considered a passing weld?

Task Number 103

Identify the causes of various welding defects; make necessary adjustments.

Definition

Identification should include

- operator error
- equipment failure
- metal impurities (e.g., contaminants).

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
D. Metal Finishing and Body Filling
Task 14

Process/Skill Questions

- What is a weld defect?
- What causes welding defects?
- How are defects prevented and/or repaired?

Task Number 104

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

Definition

Identification should include
• checking to make sure the welder is set for the correct settings of the material thickness
• inspecting and maintaining machine internals.

ASE Education Foundation
2016 Collision Master Task List
VI. Welding, Cutting, and Joining
B. Metal Welding, Cutting, and Joining
Task 15

Process/Skill Questions

• How is the proper thickness of metal determined?
• What type of shielding gas is recommended for the GMAW process?

Task Number 105

Identify the cutting process for different substrates and locations; perform the cutting operation.

Definition

Identification should include

• cutting high-strength steel and other metals, using manufacturer’s procedures
• storing, handling, and installing high-pressure gas cylinders
• identifying the cutting process for different materials and locations, in accordance with manufacturer’s procedures
• performing the cutting operation.

ASE Education Foundation
2016 Collision Master Task List
VI. Welding, Cutting, and Joining
B. Metal Welding, Cutting, and Joining
Task 16

Process/Skill Questions

• What tools should be used to perform a cutting operation?
• What safety precautions should be taken before performing a cutting operation?
• What PPE should be worn when performing a cutting operation?
Task Number 106

Identify different methods of attaching structural components.

Definition

Identification should include

- squeeze-type resistant spot welds
- riveting
- non-structural adhesive
- silicon bronze.

ASE Education Foundation
2016 Collision Master Task List
VI. Welding, Cutting, and Joining
B. Metal Welding, Cutting, and Joining
Task 17

Process/Skill Questions

- What are the different methods used to attach nonstructural components?
- How does one determine which method to use?

NATEF Program Standards

II. NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS) (2013)
   E. Metal Welding and Cutting

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

Working with Plastics and Adhesives
Task Number 107
Identify the types of plastics and their potential for repair.

Definition
Identification should include the types of plastics to be repaired (e.g., thermoplastics, thermosetting plastics).

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
F. Plastics and Adhesives
Task 1

Process/Skill Questions

- What are the different types of plastics used in the auto body industry?
- How can repairable plastic parts be distinguished from those that should be replaced?
- Why are plastics popular?
- What materials are plastics replacing in auto body manufacturing?

Task Number 108
Identify the types of plastic repair procedures.

Definition
Identification should include procedures for

- cleaning and preparing the surface of the plastic parts
- repairing plastic parts (e.g., urethane bumpers, filler panels) with airless welding:
  - setting the temperature according to manufacturer's recommendation for the plastic being welded
  - allowing about three minutes for the welder to reach operating temperature
  - ensuring that a rod is compatible with the plastic being welded
- repairing the plastic parts with urethane or epoxy adhesives, using reinforcements if necessary.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
F. Plastics and Adhesives

Task 2

Process/Skill Questions

• What are the procedures for repairing the various types of plastic parts?
• How is the surface prepared for the repair?
• How does one determine which repair method to use?

Task Number 109

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

Definition

Replacement or repair should be completed following manufacturer’s guidelines regarding procedures and industry specifications.

The type of materials and amount of damage should determine the procedure for panel repair.

The affected area should be properly prepared (panel supports may need to be straightened or aligned, and the repair area should be sanded, textured, cleaned, and primed) prior to painting.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
F. Plastics and Adhesives
Task 3

Process/Skill Questions

• Where are the rigid, semi-rigid, and flexible plastic parts on a vehicle found?
• How does one determine whether to repair or replace the panel?
• What is an International Organization for Standardization (ISO) code, and why is it seldom referenced today when repairing plastic parts?

Task Number 110
Remove or repair damaged areas from rigid exterior composite panels.

Definition

Repairing holes in rigid plastic panels should include repairing holes and cuts in rigid plastic parts, using backing material and adhesives.

Repairing other damage to rigid plastic panels should include removing damaged areas from rigid exterior sheet molded compound (SMC) panels and repairing with partial panel as follows:

- Sand and clean the back side of the panel.
- Bevel the mating edges of the new panel to a shallow taper to match the existing panel.
- Apply the recommended adhesives in a continuous bead, 3/8"–1/2" in diameter, all the way around the panel that is going to touch another part of the adjoining pieces.
- Apply adhesive to the part of the new panel that is being attached.
- Clamp the panel into place.
- Tighten the mill, and drill pad nuts securely.

ASE Education Foundation
2016 Collision Master Task List
II. Non-Structural Analysis and Damage Repair (Body Components)
F. Plastics and Adhesives
Task 4

Process/Skill Questions

- How do repair procedures for plastic parts differ from repair procedures for metal parts?
- What does SMC mean?
- What circumstances affect the procedures and materials used to repair damage to rigid plastic panels?

Task Number 111

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

Definition

Procedures should include following manufacturer’s specifications and guidelines.
Process/Skill Questions

- How are rigid panels vs. semi rigid panels determined?
- How is a bonded rigid panel removed?

Preparing for a Career in Auto Body Repair

Task Number 112

Research opportunities in the auto body repair field.

Definition

Research should include a variety of positions in the field of auto body repair and local employment options for entry-level auto body repair technicians. Research may use the following resources:

- Internet search
- Interviews with auto body employees, parts suppliers, and related businesses
- Reference and trade materials or literature

Many websites offer career exploration resources, including the Virginia Department of Education's Career Planning Guide.

Process/Skill Questions

- What methods would one use to locate jobs in one’s area?
- Why choose the auto body repair field as a potential career field?
- What other jobs use auto body repair technology skills?
Task Number 113

Prepare a portfolio of current skills.

Definition

Preparation of a portfolio should consist of a résumé, student competency record, and other industry documentation, including SkillsUSA information.

Process/Skill Questions

- Why is it important to prepare a portfolio?
- What are the steps in creating a portfolio?
- How can the portfolio help in a future career?

Common Career Technical Core

TD6
Describe career opportunities and means to achieve those opportunities in each of the Transportation, Distribution & Logistics Career Pathways.

Task Number 114

Identify the basic construction of the auto body.

Definition

Identification should include the examination and description of basic auto body construction, including differences in unibody, body over frame, and space frame.

Process/Skill Questions

- What are some types of construction of the auto body?
- What is the best type of construction? Explain.
Task Number 115

Identify ASE areas of certification.

Definition

Identification should include the four collision repair and refinish areas that may be certified, as follows:

- Structural Analysis and Damage Repair
- Non-Structural Analysis and Damage Repair (Body Components)
- Mechanical and Electrical Components
- Painting and Refinishing

Process/Skill Questions

- Where can the current ASE standards be found?
- Why is it important to know the ASE standards?
- How can certification benefit one's future career choice?

Common Career Technical Core

TD6
Describe career opportunities and means to achieve those opportunities in each of the Transportation, Distribution & Logistics Career Pathways.

Task Number 116

Create a written estimate of repairs.

Definition

Creation of an estimate should include

- calculating price based on repairs, parts, materials, and lab policy
- completing all data in a logical sequence
- writing legibly or recording digitally.

Process/Skill Questions

- What is the purpose of providing a written estimate?
- What constitutes a total-loss vehicle?
- Who determines whether the damage to a vehicle represents a total loss?
Common Career Technical Core

**TD3**
Describe the key operational activities required of successful transportation, distribution and logistics facilities.

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### SOL Correlation by Task

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
<th>Course Correlation</th>
</tr>
</thead>
</table>
| 39   | Select and use personal protective equipment (PPE); take necessary precautions with hazardous operations and materials in accordance with federal, state, and local regulations. | English: 10.5, 11.5  
History and Social Science: VUS.8, VUS.14, WHII.8  
Science: CH.1 |
<p>| 40   | Identify procedures and precautions that may apply to the vehicle being repaired. | English: 10.5, 11.5 |
| 41   | Identify vehicle system hazard types (supplemental restraint system [SRS], hybrid or electric or alternative fuel vehicles), locations, and recommended procedures before inspecting or replacing components. | English: 10.5, 11.5 |
| 42   | Select and use a National Institute for Occupational Safety and Health (NIOSH)-approved air purifying respirator. | History and Social Science: VUS.13, VUS.14 |
| 43   | Pass an industry-specific safety exam. | History and Social Science: GOVT.15 |
| 44   | Review a damage report and analyze the damage to determine appropriate methods for overall repair; develop and document a repair plan. | English: 10.5, 11.5 |
| 45   | Inspect, remove, label, store, and reinstall exterior trim and moldings. | Science: PH.11 |
| 46   | Inspect, remove, label, store, and reinstall interior trim and components. | |
| 47   | Inspect, remove, label, store, and reinstall body panels and components that may interfere with or be damaged during repair. | |
| 48   | Inspect, remove, protect, label, store, and reinstall vehicle mechanical and electrical components that may interfere with or be damaged during repair. | Science: PH.11 |
| 49   | Protect panels, glass, interior parts, and other vehicles adjacent to the repair area. | |</p>
<table>
<thead>
<tr>
<th></th>
<th>Task</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>Soap and water wash the entire vehicle; complete a pre-repair inspection checklist.</td>
<td>Science: CH.4</td>
</tr>
<tr>
<td>51</td>
<td>Prepare the damaged area using water-based and solvent-based cleaners.</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Remove corrosion protection, undercoating, sealers, and other protective coatings, as necessary, to perform repairs.</td>
<td></td>
</tr>
<tr>
<td>53</td>
<td>Inspect, remove, and reinstall repairable plastics and other components for off-vehicle repair.</td>
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</tr>
<tr>
<td>54</td>
<td>Demonstrate the safe use and operation of tools common to the collision repair industry.</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Explain vehicle parts, assemblies, and fasteners used in the collision repair industry.</td>
<td>English: 10.5, 11.5</td>
</tr>
<tr>
<td>56</td>
<td>Inspect or locate direct, indirect, or hidden damage and the direction of impact.</td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>Inspect, remove, and replace a mechanically fastened, welded, steel panel or panel assemblies.</td>
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</tr>
<tr>
<td>58</td>
<td>Determine the extent of damage to aluminum body panels; repair or replace.</td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Inspect, remove, replace, and align hood, hood hinges, and the hood latch.</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>Inspect, remove, replace, and align deck lid, lid hinges, and the lid latch.</td>
<td></td>
</tr>
<tr>
<td>61</td>
<td>Inspect, remove, replace, and align doors, latches, hinges, and related hardware.</td>
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</tr>
<tr>
<td>62</td>
<td>Inspect, remove, replace, and align tailgates, hatches, liftgates, and sliding doors.</td>
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</tr>
<tr>
<td>63</td>
<td>Inspect, remove, replace, and align bumpers, covers, reinforcements, guards, impact absorbers, and mounting hardware.</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Inspect, remove, replace, and align fenders and related panels.</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>Straighten damaged panels for body filling or metal finishing.</td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Restore corrosion protection during and after the repair.</td>
<td>Science: CH.4, CH.5</td>
</tr>
<tr>
<td>67</td>
<td>Replace door skins.</td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Restore sound deadeners and foam materials.</td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Perform panel bonding and weld bonding.</td>
<td>English: 10.5, 11.5</td>
</tr>
<tr>
<td>70</td>
<td>Diagnose and repair water leaks, dust leaks, and wind noise.</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Identify one-time-use fasteners.</td>
<td>English: 10.5, 11.5</td>
</tr>
<tr>
<td>72</td>
<td>Weld damaged or torn steel body panels; repair broken welds.</td>
<td>English: 10.5, 11.5</td>
</tr>
<tr>
<td>73</td>
<td>Prepare a panel for body filler by abrading or removing the coatings; featheredge and refine scratches before the application of body filler.</td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>Locate and repair surface irregularities on a damaged body panel using power tools, hand tools, and weld-on pulling attachments.</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>Demonstrate hammer and dolly techniques.</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>Heat-shrink stretched panel areas to proper contour.</td>
<td></td>
</tr>
<tr>
<td>77</td>
<td>Cold-shrink stretched panel areas to proper contour.</td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>Identify body filler defects; correct the cause and condition (e.g., pinholing, ghosting, staining, over catalyzing, etc.).</td>
<td></td>
</tr>
<tr>
<td>79</td>
<td>Identify different types of body fillers.</td>
<td>Science: CH.4</td>
</tr>
<tr>
<td>80</td>
<td>Shape body filler to contour; finish sanding.</td>
<td></td>
</tr>
<tr>
<td>81</td>
<td>Perform proper metal finishing techniques for aluminum.</td>
<td>English: 10.5, 11.5</td>
</tr>
<tr>
<td>82</td>
<td>Perform proper application of body filler to aluminum.</td>
<td>English: 10.5, 11.5</td>
</tr>
<tr>
<td>83</td>
<td>Straighten contours of damaged panels to a suitable condition for body fillings or metal finishing using power tools, hand tools, and weld-on pulling attachments.</td>
<td>English: 10.5, 11.5</td>
</tr>
<tr>
<td>84</td>
<td>Inspect, adjust, repair, or replace window regulators, run channels, glass, power mechanisms, and related controls.</td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>Inspect, adjust, repair, remove, reinstall, or replace weather-stripping.</td>
<td>English: 10.5, 11.5</td>
</tr>
<tr>
<td>86</td>
<td>Inspect, repair, or replace, and adjust removable power-operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs.</td>
<td></td>
</tr>
<tr>
<td>87</td>
<td>Inspect, remove, reinstall, and align a convertible top and related mechanisms.</td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>Initialize electrical components as needed.</td>
<td>English: 10.5, 11.5</td>
</tr>
<tr>
<td>89</td>
<td>Identify the considerations for cutting, removing, and welding various types of steel, aluminum, and other metals.</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Explain procedures for welding high-strength steel and other steels.</td>
<td>English: 10.5, 11.5</td>
</tr>
<tr>
<td>91</td>
<td>Explain the procedures for welding aluminum.</td>
<td>English: 10.5, 11.5</td>
</tr>
<tr>
<td>92</td>
<td>Determine the correct gas metal arc welding (GMAW) welder type.</td>
<td></td>
</tr>
<tr>
<td>93</td>
<td>Set up and attach a work clamp (i.e., ground), and adjust the GMAW welder to &quot;tune&quot; for proper electrode stickout, voltage,</td>
<td></td>
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<tr>
<td><strong>polarity, flow rate, and wire-feed speed required for the substrate being welded.</strong></td>
<td></td>
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<tr>
<td>94</td>
<td><strong>Store, handle, and install high-pressure gas cylinders; test for leaks.</strong></td>
<td><strong>Science: CH.4</strong></td>
</tr>
<tr>
<td>95</td>
<td><strong>Determine the proper angle of the gun to the joint and direction of gun travel for the type of weld being made.</strong></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td><strong>Protect adjacent panels, glass, and vehicle interior from welding and cutting operations.</strong></td>
<td></td>
</tr>
<tr>
<td>97</td>
<td><strong>Protect computers and other electronics and wires during welding procedures.</strong></td>
<td><strong>History and Social Science: VUS.14, WG.17, WHII.14</strong></td>
</tr>
<tr>
<td>98</td>
<td><strong>Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp or tack, as required.</strong></td>
<td></td>
</tr>
<tr>
<td>99</td>
<td><strong>Determine the joint type (e.g., butt weld with backing, lap) for the weld being made.</strong></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td><strong>Determine the type of weld (e.g., continuous, stitch weld, plug, etc.) for each specific welding operation.</strong></td>
<td></td>
</tr>
<tr>
<td>101</td>
<td><strong>Perform welds (e.g., plug, butt weld with and without backing, and fillet) in the flat, horizontal, vertical, and overhead positions.</strong></td>
<td><strong>English: 10.5, 11.5</strong></td>
</tr>
<tr>
<td>102</td>
<td><strong>Perform a visual evaluation and destructive test on each weld type.</strong></td>
<td></td>
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<td><strong>English: 10.5, 11.5</strong></td>
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<td><strong>Identify different methods of attaching structural components.</strong></td>
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<tr>
<td>107</td>
<td><strong>Identify the types of plastics and their potential for repair.</strong></td>
<td><strong>Science: CH.5, CH.6</strong></td>
</tr>
<tr>
<td>108</td>
<td><strong>Identify the types of plastic repair procedures.</strong></td>
<td><strong>Science: CH.5, CH.6</strong></td>
</tr>
<tr>
<td>109</td>
<td><strong>Replace or repair rigid, semi-rigid, and flexible plastic panels.</strong></td>
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<td>110</td>
<td><strong>Remove or repair damaged areas from rigid exterior composite panels.</strong></td>
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<td>111</td>
<td><strong>Replace bonded rigid exterior composite body panels; straighten or align panel supports.</strong></td>
<td><strong>English: 10.5, 11.5</strong></td>
</tr>
<tr>
<td>112</td>
<td><strong>Research opportunities in the auto body repair field.</strong></td>
<td><strong>English: 10.2, 10.8, 11.2, 11.8</strong></td>
</tr>
<tr>
<td>113</td>
<td><strong>Prepare a portfolio of current skills.</strong></td>
<td><strong>English: 10.6, 10.7, 11.6, 11.7</strong></td>
</tr>
</tbody>
</table>
Identify the basic construction of the auto body. | English: 10.5, 11.5
---|---
Identify ASE areas of certification. | English: 10.6, 10.7, 11.6, 11.7
Create a written estimate of repairs. | Mathematics: A.1

Teacher Resources

Customer Service Infusion Units

Customer Service Infusion Units (CSIU) were designed to be infused with designated CTE courses to help students in those programs achieve additional, focused, validated tasks/competencies in customer service. These units are not mandatory, and, as such, the tasks/competencies are marked as "optional," to be taught at the instructor's discretion. Teachers can find the infusion/unit in the course listing.

Entrepreneurship Infusion Units

Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked “optional.” Teachers can find the infusion/unit in the course listing.
Appendix: Credentials, Course Sequences, and Career Cluster Information

Industry Credentials: Only apply to 36-week courses

- ASE Certification Examinations
- ASE Entry-Level Certification Examinations
- College and Work Readiness Assessment (CWRA+)
- Collision Repair and Refinishing Technology Assessment
- Collision Repair Assessment
- Customer Service Examination
- Customer Service Specialist (CSS) Examination
- Mobile Communications and Electronics Installer (MCEI) Examination
- National Career Readiness Certificate Assessment
- Non-Structural Technician-ProLevel 1 Certification Test
- Professional Communications Certification Examination
- Refinish Technician-ProLevel 1 Certification Test
- Workplace Readiness Skills for the Commonwealth Examination

Concentration sequences: A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.

- Auto Body Technology II (8677/36 weeks, 280 hours)

Career Cluster: Transportation, Distribution and Logistics

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Occupations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility and Mobile Equipment Maintenance</td>
<td>Aircraft Structure, Surfaces, Rigging, and Systems Assembler</td>
</tr>
<tr>
<td></td>
<td>Automotive Body and Related Repairer</td>
</tr>
<tr>
<td></td>
<td>Automotive Glass Installer and Repairer</td>
</tr>
<tr>
<td></td>
<td>Electrical and Electronic Installer</td>
</tr>
<tr>
<td></td>
<td>Electrical and Electronic Repairer</td>
</tr>
</tbody>
</table>