



AUTOMOTIVE COLLISION REPAIR 47.0603.00

TECHNICAL STANDARDS

An Industry Technical Standards Validation Committee updated the program technical standards by aligning them to the recently updated Automotive Service Excellence (ASE) Task and Standards List and the Tool and Equipment Lists. Students completing the program are eligible to earn the ASE Certification. The Arizona Career and Technical Education Quality Commission, the validating authority for the Arizona Skills Standards Assessment System, endorsed these standards on January 24, 2024.

Note: Arizona's Professional Skills are taught as an integral part of the Automotive Collision Repair program.

The Technical Skills Assessment for Automotive Collision Repair is available SY2024-2025.

Note: In this document i.e. explains or clarifies the content and e.g. provides examples of the content that must be taught.

STANDARD 1.0 PERFORM NON-STRUCTURAL ANALYSIS AND DAMAGE REPAIR

- 1.1 Use proper personal safety equipment and take necessary precautions with hazardous operations and materials in accordance with federal, state, and local regulations
- 1.2 Use OEM (Original Equipment Manufacturer/Manufacturing) procedures to identify material and composition of the vehicle being repaired (i.e., mid steel, high strength steel, ultra-high strength steel, aluminum, composites, carbon fiber, etc.)
- 1.3 Use procedures and precautions that apply to the vehicle being repaired
- 1.4 Identify vehicle system precautions and/or inspections and recommended procedure before inspecting or replacing components [i.e., supplemental restraint system (SRS), advanced driver assistance systems (ADAS), hybrid/electric/alternative fuel vehicles, locations, etc.]
- 1.5 Perform vehicle clean-up; complete quality control using a checklist on operations performed (e.g., review estimate and develop a repair plan; secure and store any items in the repair area; remove necessary trim and panels for repair, and bag and tag hardware; vacuum glass from doors, quarters, and floors; and wipe clean any materials on panels and interior parts)
- 1.6 Review damage report and analyze damage to determine appropriate methods for overall repair and develop and document a repair plan
- 1.7 Inspect, remove, protect, label, store, inventory, and reinstall exterior trim and moldings
- 1.8 Inspect, remove, protect, label, store, inventory, and reinstall interior trim and components
- 1.9 Inspect, remove, protect, label, store, inventory, and reinstall body panels and components that may interfere with or be damaged during repair
- 1.10 Inspect, remove, protect label, store, inventory, and reinstall vehicle mechanical and electrical components that may interfere with or be damaged during repair
- 1.11 Protect panels, glass, interior parts, and other vehicles adjacent to the repair area
- 1.12 Wash entire vehicle with soap and water and complete pre-repair inspection checklist (e.g., secure and store any items in the way of vehicle repair; remove and store any item removed for repair; bag and tag any hardware for easy reassembly; wash vehicle with soap and water; and cover any adjacent panels, glass, and trim to protect from damage during repair)
- 1.13 Prepare damaged area using water-based and solvent-based cleaners
- 1.14 Remove corrosion protection, undercoating, sealers, and other protective coatings as necessary to perform repairs
- 1.15 Inspect, remove, and reinstall repairable plastics and other components for off-vehicle repair

STANDARD 2.0 PERFORM OUTER BODY PANEL REPAIRS, REPLACEMENTS, AND ADJUSTMENTS

- 2.1 Inspect, remove, replace, and align hood, hood hinges, and hood latch
- 2.2 Inspect, remove, replace, and align deck lid, lid hinges, and lid latch
- 2.3 Inspect, remove, replace, and align doors, latches, hinges, and related hardware
- 2.4 Inspect, remove, replace, and align tailgates, hatches, liftgates, and sliding doors
- 2.5 Inspect, remove, replace, overhaul, and align bumpers, covers, reinforcement, guards, impact absorbers, and mounting hardware
- 2.6 Inspect, remove, replace, and align fenders, and related panels
- 2.7 Restore corrosion protection during and after the repair
- 2.8 Replace seam sealer to match OEM appearance

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- 2.9 Restore sound deadeners and foam materials
- 2.10 Identify one-time use fasteners
- 2.11 Inspect, identify labels/decals, and replace as necessary
- 2.12 Follow manufacture guidelines when applying heat to non-structural components during repair

STANDARD 3.0 PERFORM METAL FINISHING AND BODY FILLING

- 3.1 Prepare a panel for body filler by abrading or removing the coatings; featheredge, refine scratches, and clean the surface before the application of body filler
- 3.2 Locate and repair surface irregularities and straighten contours on a damaged body panel using power tools, hand tools, and weld-on pulling attachments
- 3.3 Demonstrate hammer and dolly techniques
- 3.4 Heat shrink stretched panel areas to proper contour
- 3.5 Cold shrink stretched panel areas to proper contour
- 3.6 Identify body filler defects and correct the cause and conditions (i.e., pinholing, ghosting, staining, over catalyzing, etc.)
- 3.7 Identify different types of body fillers
- 3.8 Shape body filler to contour and finish sanding
- 3.9 Perform proper metal finishing techniques for aluminum
- 3.10 Perform proper application of body filler to aluminum
- 3.11 Locate and repair surface irregularities and straighten contours on a damaged panel using Glue-Pulling Dent Repair (GPDR)
- 3.12 Mix and apply body filler

STANDARD 4.0 DETERMINE MOVEABLE GLASS AND HARDWARE REQUIREMENTS

- 4.1 Inspect, adjust, overhaul, repair, or replace window regulators, run channels, glass, power mechanisms, and related controls
- 4.2 Inspect, adjust, repair, remove, reinstall, or replace weather-stripping
- 4.3 Inspect, remove, repair or replace, and adjust removable power-operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs

STANDARD 5.0 PERFORM PLASTICS, ADHESIVES, AND WELDING REPARABILITY

- 5.1 Identify the types of plastics and determine reparability
- 5.2 Identify location of damage relative to safety systems (ADAS); determine reparability according to manufacturer repair procedures
- 5.3 Clean and prepare the surface of plastic parts and identify the types of plastic repair procedures
- 5.4 Repair rigid, semi-rigid, and flexible plastic panels
- 5.5 Remove, replace, or repair damaged areas of rigid exterior composite panels
- 5.6 Repair plastic parts by welding (e.g., nitrogen and airless)
- 5.7 Perform a single-sided adhesively bonded cosmetic repair
- 5.8 Perform a double-sided adhesively bonded repair
- 5.9 Perform an adhesively bonded or welded tab repair
- 5.10 Shape and reform damaged plastic

STANDARD 6.0 APPLY SAFETY PRECAUTIONS WHEN PAINTING AND REFINISHING

- 6.1 Select and use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (i.e., gloves, suits, hoods, eye and ear protection, etc.) and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations
- 6.2 Identify safety and personal health hazards according to OSHA guidelines, the "Right to Know Law", and Safety Data Sheet (SDS) information
- 6.3 Inspect spray environment and equipment to ensure compliance with federal, state, and local regulations, and for safety and cleanliness hazards
- 6.4 Select and use a NIOSH approved respiratory protection system (supplied air/fresh air make up recommended) and perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulations
- 6.5 Perform vehicle clean-up and complete quality control using a checklist on operations performed (e.g., use soap, water, and sponge to wash vehicle, wheel wells, wheels, door jams, hood, and truck jams; dry vehicle using an absorbent towel; clean all glass and chrome; in booth, pick up any loose paper and tape; sweep, clean floor and walls, and remove water from floors and walls with broom and squeegee)

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- 6.6 Demonstrate knowledge of the process for tracking of expelled volatile organic compounds (VOCs)
- 6.7 Follow federal, state, and local regulations regarding the handling and disposal of refinishing waste products

STANDARD 7.0 PERFORM SURFACE PREPARATION FOR PAINTING AND REFINISHING

- 7.1 Inspect, remove, store, protect, and replace exterior trim and components necessary for proper surface preparation
- 7.2 Wash entire vehicle with soap and water and use appropriate cleaner to remove contaminants
- 7.3 Remove paint finish as needed
- 7.4 Properly sand areas to be refinished
- 7.5 Identify and select appropriate sandpaper to featheredge areas to be refinished
- 7.6 Apply suitable metal treatment or primer in accordance with total product systems
- 7.7 Mask and protect other areas that will not be refinished
- 7.8 Demonstrate different masking techniques (i.e., recess/back masking, foam door type, etc.)
- 7.9 Mix primer, primer surfacer, and primer sealer following the paint technical data sheet instructions according to the manufacturer
- 7.10 Apply primer onto surface of repaired area, demonstrating control of primer application by keeping the areas as small as possible
- 7.11 Force curing and drying of primer coating following paint manufacturers technical data sheet
- 7.12 Apply two-component finishing filler to minor surface imperfections
- 7.13 Guide coat and block sand area with correct grade/grit sandpaper to which primer surfacer has been applied
- 7.14 Dry sand area to which two-component finishing filler has been applied
- 7.15 Remove dust from area to be refinished, including cracks or moldings of adjacent areas
- 7.16 Clean area to be refinished using a recommended final cleaning solution
- 7.17 Prepare adjacent panels for blending using paint manufacturers procedures
- 7.18 Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials needed, preparation, and refinishing procedures
- 7.19 Identify metal parts to be refinished and determine the materials needed, preparation, and refinishing procedures
- 7.20 Identify refinishing guidelines for stationary glass flange areas to be refinished

STANDARD 8.0 PERFORM SPRAY GUN AND RELATED EQUIPMENT OPERATION

- 8.1 Inspect, clean, and determine condition of spray guns and related equipment (e.g., air hoses, regulators, air lines, air source, spray environment, and filters)
- 8.2 Select spray gun setup (e.g., fluid needle, nozzle, and cap) for product being applied
- 8.3 Test and adjust spray gun using fluid, air and pattern control valves

STANDARD 9.0 PERFORM DAMAGE ANALYSIS

- 9.1 Identify components to be removed to gain access to damaged areas
- 9.2 Analyze damage to determine appropriate methods in accordance with manufacturers recommendations and guidelines
- 9.3 Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage
- 9.4 Perform visual inspection of non-structural components and members
- 9.5 Determine parts, components, material type(s), and procedures necessary for a proper repair
- 9.6 Identify suspension, electrical, and mechanical component physical damage
- 9.7 Identify single (one time) use components

STANDARD 10.0 PERFORM ESTIMATION

- 10.1 Record customer/vehicle owner information
- 10.2 Record vehicle identification number (VIN) information, including nation of origin, make, model, restraint system, body type, production date, engine type, build data, and assembly plant
- 10.3 Record vehicle mileage and options, including trim level, paint code, transmission, accessories, and modifications
- 10.4 Identify safety systems and determine precautions, inspections, and replacement items as required
- 10.5 Apply appropriate estimating and parts nomenclature (terminology)

STANDARD 11.0 DETERMINE VEHICLE CONSTRUCTION AND PARTS IDENTIFICATION

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- 11.1 Identify type of vehicle construction (e.g., unibody, body-over-frame, and alternates)
- 11.2 Recognize the different collision damage between unibody and body-over-frame vehicles
- 11.3 Identify impact energy absorbing components
- 11.4 Identify different types of substrates (i.e., steel types, aluminum, magnesium, plastic, composites, etc.) and determine reparability
- 11.5 Identify vehicle glass components and repair/replacement procedures
- 11.6 Identify add-on accessories
- 11.7 Recognize different vehicle joining/attaching methods (e.g., welding, adhesives, and rivets)

STANDARD 12.0 PERFORM MECHANICAL AND ELECTRICAL COMPONENT OPERATIONS FOR SUSPENSION AND STEERING, FUEL INTAKE, AND EXHAUST SYSTEMS
(ELECTRICAL – Note: All tasks in this section refer to low voltage system and components only.)

- 12.1 Reinstall wheels and tighten lug nuts to manufacturer specification using a torque wrench
- 12.2 Remove, replace, and recharge battery
- 12.3 Check operation and aim headlamp assemblies and fog/driving lamps
- 12.4 Remove and replace horn(s); check operation
- 12.5 Check operation of wiper/washer systems
- 12.6 Remove and replace air intake components