

Instructional Framework

Automotive Collision Repair

47.0603.00

This Instructional Framework identifies, explains, and expands the content of the standards/measurement criteria, and, as well, guides the development of multiple-choice items for the Technical Skills Assessment. This document corresponds with the Technical Standards endorsed in January 2024.



Domain 1: Safety and Surface Preparation

Instructional Time: 40 - 50%

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	• Safety • Repair plan • Cleaning procedures
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	• Safety • Proper tool usage • Body panel repair procedures
3.3 Demonstrate hammer and dolly techniques	• Hammer techniques • Dolly techniques
3.4 Heat shrink stretched panel areas to proper contour	• Safety • Proper tool usage • Heat shrink procedures
3.5 Cold shrink stretched panel areas to proper contour	• Safety • Cold shrink procedures
3.6 Identify body filler defects and correct the cause and conditions (i.e., pinholing, ghosting, staining, over catalyzing, etc.)	• Body filler defects ◦ Pinholing ◦ Ghosting ◦ Staining ◦ Over catalyzing, etc.
3.7 Identify different types of body fillers	• Uses of different fillers
3.8 Shape body filler to contour and finish sanding	• Safety • Body filler sanding techniques

3.9 Perform proper metal finishing techniques for aluminum	• Safety • Aluminum vs. steel sanding difference
3.10 Perform proper application of body filler to aluminum	• Aluminum vs. steel body filler difference
3.11 Locate and repair surface irregularities and straighten contours on a damaged panel using Glue-Pulling Dent Repair (GPDR)	• Safety • Plastic repair procedures • Glue-Pulling Dent Repair (GPDR)
3.12 Mix and apply body filler	• Safety • Mixing procedures
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	• Proper personal safety equipment ◦ Gloves ◦ Suits ◦ Hoods ◦ Eye and ear protection, etc.
6.2 Identify safety and personal health hazards according to OSHA guidelines, the “Right to Know Law”, and Safety Data Sheet (SDS) information	• Safety • Health hazards • OSHA • Right to Know Law
6.3 Inspect spray environment and equipment to ensure compliance with federal, state, and local regulations, and for safety and cleanliness hazards	• Safety • State and local compliance
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	• NIOSH • OSHA Regulation • Inspect and maintain a fresh air supplied respirator
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)	• Quality control using a checklist on operations performed ◦ 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
6.6 Demonstrate knowledge of the process for tracking of expelled volatile organic compounds (VOCs)	● Research state and/or federal guidelines ● Locate manufacturer's data
6.7 Follow federal, state, and local regulations regarding the handling and disposal of refinishing waste products	● Research proper handling and disposal of 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	● Removal and installation procedures
7.2 Wash entire vehicle with soap and water and use appropriate cleaner to remove contaminants	● Pre-repair procedure ● Washing procedures
7.3 Remove paint finish as needed	● Diagnose finish ● Repair plan
7.4 Properly sand areas to be refinished	● Sanding procedures
7.5 Identify and select appropriate sandpaper to featheredge areas to be refinished	● Featheredge panels ● Select abrasives
7.6 Apply suitable metal treatment or primer in accordance with total product systems	● Safety ● Apply suitable metal treatments
7.7 Mask and protect other areas that will not be refinished	● Protect adjacent panels
7.8 Demonstrate different masking techniques (i.e., recess/back masking, foam door type, etc.)	● Masking techniques ○ 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	● Mix undercoats ● Interpret PDS sheets
7.10 Apply primer onto surface of repaired area, demonstrating control of primer application by keeping the areas as small as possible	● Safety ● Apply primers
7.11 Force curing and drying of primer coating following paint manufacturers technical data sheet	● Force curing and drying of primer coating ○ Refer to manufacturer's specifications

7.12 Apply two-component finishing filler to minor surface imperfections	• Minor imperfection correction
7.13 Guide coat and block sand area with correct grade/grit sandpaper to which primer surfacer has been applied	• Using guide coats • Repair procedures
7.14 Dry sand area to which two-component finishing filler has been applied	• Finish sanding techniques • Dry sand finishing filler
7.15 Remove dust from area to be refinished, including cracks or moldings of adjacent areas	• Remove dust
7.16 Clean area to be refinished using a recommended final cleaning solution	• Clean panels with appropriate cleaners
7.17 Prepare adjacent panels for blending using paint manufacturers procedures	• Prepare panels for blending
7.18 Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials needed, preparation, and refinishing procedures	• Identify plastics • ISO numbers • Repair procedures
7.19 Identify metal parts to be refinished and determine the materials needed, preparation, and refinishing procedures	• Repair/refinish procedures
7.20 Identify refinishing guidelines for stationary glass flange areas to be refinished	• Safety • Manufacturers glass setting guidelines

Domain 2: Non-Structural Repair and Analysis

Instructional Time: 25 - 30%

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	• Safety • PPE instruction
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.)	• Original Equipment Manufacturer/Manufacturing procedures ○ 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	● Safety ● Hybrid/electric/alternate fuel safety protocols
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.]	● Vehicle system precautions and/or inspections ○ 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)	● Vehicle clean-up ● Quality control using a checklist ○ 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 ○ 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	● Review estimate and develop a repair plan ● Repair methods ● Document repair plan
1.7 Inspect, remove, protect, label, store, inventory, and reinstall exterior trim and moldings	● Follow storage protocol, and bag and tag items ● Trim and molding procedures
1.8 Inspect, remove, protect, label, store, inventory, and reinstall interior trim and components	● Follow storage protocol, and bag and tag items ● Removing and installing trim procedures ● Importance of labeling and storage
1.9 Inspect, remove, protect, label, store, inventory, and reinstall body panels and components that may interfere with or be damaged during repair	● Follow storage protocol, and bag and tag items ● Removing and installing body panels procedures ● Importance of labeling and storage
1.10 Inspect, remove, protect label, store, inventory, and reinstall vehicle mechanical and electrical components that may interfere with or be damaged during repair	● Follow storage protocol, and bag and tag items ● Use proper methods when handling electrical components ● Importance of labeling and storage
1.11 Protect panels, glass, interior parts, and other vehicles adjacent to	● Safety

the repair area	• Protect panels (glass and interior) • Protect adjacent 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)	• Pre-repair inspection checklist ◦ 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 ◦ 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	• Safety • Cleaning procedures
1.14 Remove corrosion protection, undercoating, sealers, and other protective coatings as necessary to perform repairs	• Safety • Protective coatings removal procedures
1.15 Inspect, remove, and reinstall repairable plastics and other components for off-vehicle repair	• Assembly and disassembly procedures
STANDARD 2.0 PERFORM OUTER BODY PANEL REPAIRS, REPLACEMENTS, AND ADJUSTMENTS	
2.1 Inspect, remove, replace, and align hood, hood hinges, and hood latch	• Safety • Aluminum Repair Plan • Aluminum repair procedure per manufacturer recommendation
2.2 Inspect, remove, replace, and align deck lid, lid hinges, and lid latch	• Panel alignment repair plan • Adjustment procedures
2.3 Inspect, remove, replace, and align doors, latches, hinges, and related hardware	• Repair plan • Adjustment procedures • Bag and tag
2.4 Inspect, remove, replace, and align tailgates, hatches, liftgates, and sliding doors	• Repair plan • Adjustment procedures
2.5 Inspect, remove, replace, overhaul, and align bumpers, covers, reinforcement, guards, impact absorbers, and mounting hardware	• Safety • Repair plan • Repair procedures
2.6 Inspect, remove, replace, and align fenders, and related panels	• Safety • Repair plan

2.7 Restore corrosion protection during and after the repair	• Safety • Repair plan • Restore protective coatings
2.8 Replace seam sealer to match OEM appearance	• Safety • Repair plan • Repair procedures
2.9 Restore sound deadeners and foam materials	• Safety • Repair procedures
2.10 Identify one-time use fasteners	• Inspect hardware • Fastener types • Remove and replace procedures
2.11 Inspect, identify labels/decals, and replace as necessary	• Source decals and labels
2.12 Follow manufacture guidelines when applying heat to non-structural components during repair	• Protect areas near weld
STANDARD 11.0 DETERMINE VEHICLE CONSTRUCTION AND PARTS IDENTIFICATION	
11.1 Identify type of vehicle construction (e.g., unibody, body-over-frame, and alternates)	• Vehicle construction ◦ Unibody ◦ Body-over-frame ◦ Alternates
11.2 Recognize the different collision damage between unibody and body-over-frame vehicles	• Collision damage • Unibody • Body-over-frame vehicles
11.3 Identify impact energy absorbing components	• Identify safety crush zones
11.4 Identify different types of substrates (i.e., steel types, aluminum, magnesium, plastic, composites, etc.) and determine reparability	• Substrates ◦ Steel types ◦ Aluminum ◦ Magnesium ◦ Plastic ◦ Composites, etc.
11.5 Identify vehicle glass components and repair/replacement procedures	• Glass component • Repair techniques

11.6 Identify add-on accessories	• Source aftermarket accessories
11.7 Recognize different vehicle joining/attaching methods (e.g., welding, adhesives, and rivets)	• Vehicle joining/attaching methods ◦ Welding ◦ Adhesives ◦ Rivets

Domain 3: Plastic Repair, Spray Equipment, and Moveable Glass

Instructional Time: 10 - 15%

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	• Safety • Repair procedures • Window component service procedures
4.2 Inspect, adjust, repair, remove, reinstall, or replace weather-stripping	• Safety • Weatherstrip service procedures
4.3 Inspect, remove, repair or replace, and adjust removable power-operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs	• Safety • Sunroof repair procedures • Diagnose and adjust power sunroofs

STANDARD 5.0 PERFORM PLASTICS, ADHESIVES, AND WELDING REPARABILITY

5.1 Identify the types of plastics and determine reparability	• Types of plastics • Reparability
5.2 Identify location of damage relative to safety systems (ADAS); determine reparability according to manufacturer repair procedures	• Identify safety systems damage
5.3 Clean and prepare the surface of plastic parts and identify the types of plastic repair procedures	• Safety • Plastic repair procedures
5.4 Repair rigid, semi-rigid, and flexible plastic panels	• Safety • Plastic repair procedures
5.5 Remove, replace, or repair damaged areas of rigid exterior composite panels	• Safety • Plastic repair procedures

5.6 Repair plastic parts by welding (e.g., nitrogen and airless)	• Plastic welding ◦ Nitrogen ◦ Airless
5.7 Perform a single-sided adhesively bonded cosmetic repair	• Safety • Single-sided adhesively bonded cosmetic repair
5.8 Perform a double-sided adhesively bonded repair	• Safety • Double-sided adhesively bonded repair
5.9 Perform an adhesively bonded or welded tab repair	• Safety • Adhesively bonded or welded tab repair
5.10 Shape and reform damaged plastic	• Safety • Shape and reform damaged plastic
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)	• Spray guns and related equipment ◦ Air hoses ◦ Regulators ◦ Air lines ◦ Air source ◦ Spray environment ◦ Filters
8.2 Select spray gun setup (e.g., fluid needle, nozzle, and cap) for product being applied	• Spray gun setup ◦ Fluid needle ◦ Nozzle ◦ Cap
8.3 Test and adjust spray gun using fluid, air and pattern control valves	• Spray out pattern test

Domain 4: Damage Analysis, Estimation, and Mechanical and Electrical Repairs

Instructional Time: 10 - 15%

STANDARD 9.0 PERFORM DAMAGE ANALYSIS

9.1 Identify components to be removed to gain access to damaged areas	• Gain access for inspection
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9.2 Analyze damage to determine appropriate methods in accordance with manufacturers recommendations and guidelines	- Analyze damage - Determine repair methods
9.3 Determine the direction, point(s) of impact, and extent of direct, indirect, and inertia damage	Determine direct and indirect damage
9.4 Perform visual inspection of non-structural components and members	Perform overall visual inspection
9.5 Determine parts, components, material type(s), and procedures necessary for a proper repair	Identify components
9.6 Identify suspension, electrical, and mechanical component physical damage	Identify supplemental damage
9.7 Identify single (one time) use components	Identify one time use components
STANDARD 10.0 PERFORM ESTIMATION	
10.1 Record customer/vehicle owner information	Record customer 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	- Record VIN numbers - Record vehicle build data
10.3 Record vehicle mileage and options, including trim level, paint code, transmission, accessories, and modifications	- Record vehicle mileage - Record vehicle options
10.4 Identify safety systems and determine precautions, inspections, and replacement items as required	- Safety - Inspect safety components
10.5 Apply appropriate estimating and parts nomenclature (terminology)	Use appropriate estimating terminology
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	Verify lug nut torque using manufacturer's torque specification
12.2 Remove, replace, and recharge battery	- Safety precautions - Recharge battery - Remove and install battery - Diagnose battery connection conditions

12.3 Check operation and aim headlamp assemblies and fog/driving lamps	• Aim and adjust headlights using factory specifications
12.4 Remove and replace horn(s); check operation	• Check horn operations • Remove and replace horn(s) as necessary
12.5 Check operation of wiper/washer systems	• Check wiper/washer systems • Ensure component connections and operation
12.6 Remove and replace air intake components	• Check air intake components for damage • Ensure air intake connections and operation

