

Identifier	Poplar - Apprentice - Collision Repair Technology		Introduced	Completed
A CR 1	SAFETY			
A CR 1.1.01	General Rules	Identify potential general shop safety hazards.		
A CR 1.2.01	Fire Safety	Identify potential fire safety hazards.		
A CR 2	STRUCTURAL ANALYSIS AND DAMAGE REPAIR			
A CR 2.1.01	Frame	Attach vehicle to anchoring devices.		
A CR 2.1.02	Frame	Identify heat limitations in structural components in accordance with vehicle manufacturer's specifications/procedures.		
A CR 2.1.03	Frame	Restore structural foam in accordance with vehicle manufacturer's specifications/procedures.		
A CR 2.1.04	Frame	Discuss the extent of the direct and indirect damage and the direction of impact; discuss the methods and sequence of repair.		
A CR 2.2.01	Inspection/ Repair	Inspect the locations of all suspension, steering, and powertrain component attaching points on the vehicle.		
A CR 2.2.02	Inspection/ Repair	Discuss the extent of the direct and indirect damage and the direction of impact; plan and document the methods and sequence of repair.		
A CR 2.2.03	Inspection/ Repair	Attach anchoring devices to vehicle; remove or reposition components as necessary.		
A CR 2.2.04	Inspection/ Repair	Identify heat limitations in unibody vehicles in accordance with vehicle manufacturer's specifications/procedures.		
A CR 2.2.05	Inspection/ Repair	Identify proper cold stress relief methods.		
A CR 2.2.06	Inspection/ Repair	Repair damage using power tools and hand tools to restore proper contours and dimensions.		
A CR 2.2.07	Inspection/ Repair	Restore corrosion protection to repaired or replaced unibody structural areas.		
A CR 2.2.08	Inspection/ Repair	Store, handle, and install high-pressure gas cylinders.		
A CR 2.2.09	Inspection/ Repair	Determine work clamp (ground) location and attach.		
A CR 2.2.10	Inspection/ Repair	Protect adjacent panels, glass, vehicle interior, etc., from welding and cutting operations.		
A CR 2.2.11	Inspection/ Repair	Protect computers and other electronic control modules during welding procedures according to manufacturer's specifications.		
A CR 2.2.12	Inspection/ Repair	Determine the joint type (butt weld with backing, lap, etc.) welding made according to manufacturer's/industry specifications.		
A CR 2.3.01	Glass	Visually inspect glass for damage.		
A CR 2.3.02	Glass	Identify heating elements in glass windows.		
A CR 2.4.01	Welding/ Cutting	Recognize the weldable and non-weldable materials.		
A CR 2.4.02	Welding/ Cutting	Identify welding equipment used in auto body welding and repair.		
A CR 2.4.03	Welding/ Cutting	Identify different types of welds used in metal repair.		
A CR 3	NONSTRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)			
A CR 3.1.01	Preparation	Review damage report and analyze damage to determine appropriate methods of repair.		
A CR 3.1.02	Preparation	Protect panels, glass, and parts adjacent to the repair area.		
A CR 3.1.03	Preparation	Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants from those areas to be repaired.		
A CR 3.1.04	Preparation	Apply safety procedures associated with vehicle components and systems according to manufacturer's specifications/procedures.		
A CR 3.2.01	Panels	Discuss the extent of direct and indirect damage and direction of impact; develop and document a repair plan.		
A CR 3.2.02	Panels	Replace corrosion protection.		
A CR 3.2.03	Panels	Restore sound deadeners and foam materials.		
A CR 3.3.01	Finishing/ Filling	Remove paint from the damaged area of a body panel.		
A CR 3.3.02	Finishing/ Filling	Mix body filler.		
A CR 3.4.01	Glass/ Hardware	Inspect, repair or replace, and adjust removable, manually or power operated roof panel and hinges, latches, guides, handles, retainer, and controls of sunroofs.		
A CR 3.4.02	Glass/ Hardware	Scrutinize, remove, reinstall, and align convertible top and related mechanisms.		
A CR 3.5.01	Welding/ Cutting	Store, handle, and install high-pressure gas cylinders.		
A CR 3.5.02	Welding/ Cutting	Determine work clamp (ground) location and attach.		
A CR 3.5.03	Welding/ Cutting	Protect adjacent panels, glass, vehicle interior, etc., from welding and cutting operations.		
A CR 3.5.04	Welding/ Cutting	Protect computers and other electronic control modules during welding procedures according to manufacturer's specifications.		
A CR 3.5.05	Welding/ Cutting	Determine the joint type (butt weld with backing, lap, etc.) for weld being made according to manufacturer's/industry specifications.		
A CR 3.6.01	Plastics	Identify the types of plastics; determine reparability.		
A CR 4	MECHANICAL AND ELECTRICAL COMPONENTS			
A CR 4.1.01	Suspension/ Steering	Diagnose tire pull (lead) problems; determine corrective action.		
A CR 4.1.02	Suspension/ Steering	Inspect tires, identify direction of rotation, and location; check and adjust air pressure.		
A CR 4.1.03	Suspension/ Steering	Reinstall wheels and torque lug nuts according to manufacturer's specifications.		
A CR 4.1.04	Suspension/ Steering	Examine tire wear patterns; determine repairs needed.		
A CR 4.2.01	Electrical Components	Perform battery state-of-charge test; determine needed service.		
A CR 4.2.02	Electrical Components	Inspect, clean, and replace battery.		
A CR 4.3.01	Brakes	Identify, handle, store, and install appropriate brake fluids; dispose of in accordance with federal, state, and local regulations.		
A CR 4.3.02	Brakes	Reinstall wheel and torque lug nuts according to manufacturer's specifications.		
A CR 4.3.03	Brakes	Clean and inspect caliper mountings for wear and damage.		

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A CR 4.3.04	Brakes	Check parking brake system operation.		
A CR 4.4.01	Air Conditioning	Identify, label, and store refrigerant.		
A CR 4.5.01	Cooling Systems	Identify all cooling system components.		
A CR 4.5.02	Cooling Systems	Identify proper cooling system replacement products.		
A CR 4.6.01	Drive Train	Identify powertrain mechanical and electrical components.		
A CR 4.7.01	Fuel Intake/ Exhaust	Identify the fuel-intake system.		
A CR 4.7.02	Fuel Intake/ Exhaust	Identify the exhaust system components.		
A CR 4.7.03	Fuel Intake/ Exhaust	Inspect the fuel tank and exhaust systems.		
A CR 4.8.01	Restraint Systems	Identify active, passive, and supplemental restraint systems.		
A CR 4.8.02	Restraint Systems	Examine seatbelt and shoulder harness assemblies.		
A CR 5	PAINTING AND REFINISHING PROCEDURES			
A CR 5.1.01	Health Safety Environmental	Identify and take necessary precautions with hazardous operations and materials including VOCs according to federal, state, and local regulations.		
A CR 5.1.02	Health Safety Environmental	Identify safety and personal health hazards according to OSHA guidelines and the "Right to Know Law."		
A CR 5.2.01	Surface Preparation	Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants.		
A CR 5.2.02	Surface Preparation	Dry or wet sand areas to be refinished.		
A CR 5.2.03	Surface Preparation	Featheredge damaged areas to be refinished.		
A CR 5.2.04	Surface Preparation	Mask and protect other areas that will not be refinished.		
A CR 5.2.05	Surface Preparation	Clean area to be refinished using a final cleaning solution.		
A CR 5.2.06	Surface Preparation	Remove, with a tack rag, any dust or lint particles from the area to be refinished.		
A CR 5.3.01	Spraying	Inspect, clean, and determine condition of spray guns and related equipment (air hoses, regulators, air lines, air source, and spray environment).		
A CR 5.4.01	Paints	Determine type and color of paint already on vehicle by manufacturer's vehicle information label.		
A CR 5.5.01	Paint Defects	Identify preparation defects.		
A CR 5.5.02	Paint Defects	Identify and list basic painting defects.		
A CR 5.6.01	Detailing	Clean interior, exterior, and glass.		
A CR 5.6.02	Detailing	Clean body openings (door jambs and edges, etc.).		
A CR 6	ESTIMATING			
A CR 6.1.01	Damage Reports	Locate and use the information in the procedure pages.		
A CR 6.2.01	Repair Estimating	List common terms found on damage report and provide examples of each.		
A CR 6.2.02	Repair Estimating	Define the term "additional time" and identify examples.		
A CR 6.3.01	Finishing Types	Measure mil thickness.		
A CR 6.3.02	Finishing Types	Identify three automotive finishes.		
A CR 6.3.03	Finishing Types	Explain the purposes of various automotive finishes.		
A CR 6.4.01	Information	Identify locations on a vehicle that contain vital information.		
A CR 6.4.02	Information	Locate anti-theft labels on a vehicle.		
A CR 6.5.01	Reports	Review a properly prepared damage report.		
A CR 7	EMPLOYABILITY SKILLS			
A CR 7.1.01	Problem Solving	Identify the basic steps in the problem-solving process.		
A CR 7.1.02	Problem Solving	Identify alternative solutions to solve a problem.		
A CR 7.1.03	Problem Solving	Identify basic steps needed to repair the vehicle.		
A CR 7.1.04	Problem Solving	Identify the knowledge of common flow charts and its components.		
A CR 7.1.05	Problem Solving	Utilize computers and other forms of information used to access data to solve problems.		
A CR 7.2.01	Critical Thinking	Identify the importance of thinking skills in analyzing and offering solutions to repair issues.		
A CR 7.2.02	Critical Thinking	Identify the essential steps of critical thinking.		
A CR 7.2.03	Critical Thinking	Identify the basic components of an action plan.		
A CR 7.3.01	Speak, Write, Listen	Demonstrate proper telephone etiquette.		
A CR 7.3.02	Speak, Write, Listen	Demonstrate active listening skills.		
A CR 7.3.03	Speak, Write, Listen	Select and utilize an appropriate medium for conveying messages with dignity and respect.		
A CR 7.3.04	Speak, Write, Listen	Demonstrate sensitivity to cultural diversity in communication.		
A CR 7.4.01	Technology	Demonstrate ability to utilize basic keyboarding techniques.		
A CR 7.4.02	Technology	Identify and demonstrate the appropriate use of technology to enhance the efficiency of the workplace and school.		
A CR 7.4.03	Technology	Recognize the impact of essential technological changes on the auto collision repair industry as reported in current literature.		
A CR 7.4.04	Technology	Identify appropriate technology for repairing automotive systems.		
A CR 7.5.01	Leadership and Teamwork	Demonstrate respect for team members, team processes and team goals.		
A CR 7.5.02	Leadership and Teamwork	Describe the importance of company dress codes.		
A CR 7.5.03	Leadership and Teamwork	Establish credibility through competence and integrity.		
A CR 7.6.01	Ethics	List the important ethics in the workplace.		
A CR 7.6.02	Ethics	Meet attendance standards.		
A CR 7.6.03	Ethics	Comply with all safety and health rules and procedures.		
A CR 7.6.04	Ethics	Identify hazardous substances in the workplace.		
A CR 7.6.05	Ethics	Describe an organized workplace.		

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A CR 7.6.06	Ethics	Gain an understanding and follow emergency procedures.		
A CR 7.6.07	Ethics	Identify appropriate responses to unethical actions.		
A CR 7.7.01	Workplace	List effective time management skills.		
A CR 7.7.02	Workplace	Use technology to complete assignments.		
A CR 7.7.03	Workplace	Utilize materials, tools, and processes to complete a task related to a career selection.		
A CR 7.7.04	Workplace	Read and follow instructions from manuals on the use and care of materials, tools, and equipment.		
A CR 7.7.05	Workplace	Maintain a clean, organized, and safe job site.		
A CR 7.7.06	Workplace	Identify traits needed for cooperation and leadership in a team at school or in a workplace.		
A CR 7.7.07	Workplace	Identify the material resources and space requirements needed to complete an assignment.		
A CR 7.8.01	Career	Locate employment opportunities.		
A CR 7.8.02	Career	Identify job requirements for entry-level positions in the collision repair industry.		
A CR 7.8.03	Career	Identify general conditions for employment.		
A CR 7.8.04	Career	Identify educational/training requirements for related collision repair field.		
A CR 7.8.05	Career	Identify the elements of goal setting.		
A CR 7.8.06	Career	Identify automotive related careers.		
A CR 7.8.07	Career	Describe essential job interview skills.		
A CR 7.8.08	Career	Identify the components of a career portfolio.		
A CR 7.9.01	Retention	Describe the importance of a portfolio.		
A CR 7.9.02	Retention	Identify options for lifelong learning.		
A CR 7.9.03	Retention	Identify interpersonal skills needed for job retention.		
A CR 7.9.04	Retention	Identify jobs with opportunity for advancement.		
A CR 7.9.05	Retention	Describe the importance of career planning.		

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J CR 1	SAFETY			
J CR 1.1.01	General Rules	Demonstrate proper use of safety apparel at all times, including but not limited to eye protection, hearing protection, skin protection and protection from airborne particulate matter.		
J CR 1.1.02	General Rules	Demonstrate the safe use and proper care of hand tools.		
J CR 1.1.03	General Rules	Demonstrate the safe use and proper care of portable power tools.		
J CR 1.1.04	General Rules	Demonstrate the safe use and proper care of heavy equipment.		
J CR 1.1.05	General Rules	Demonstrate the safe handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.		
J CR 1.1.06	General Rules	Always keep hands, long hair, and tools a safe distance from any rotating parts.		
J CR 1.1.07	General Rules	Properly exhaust running engines, using an exhaust hose or other apparatus.		
J CR 1.1.08	General Rules	Demonstrate safe use and maintenance of high pressure hoses and air guns.		
J CR 1.1.09	General Rules	Always clean asbestos-laden components with an OSHA-approved parts washer.		
J CR 1.1.10	General Rules	Always ensure a vehicle is properly stationed prior to servicing (i.e., application of the parking brake).		
J CR 1.1.11	General Rules	Demonstrate proper use of safety stands when working under vehicle.		
J CR 1.1.12	General Rules	Always use OSHA-approved trouble lights.		
J CR 1.1.13	General Rules	Always operate OSHA-approved equipment according to the manufacturer's recommended procedure.		
J CR 1.1.14	General Rules	Demonstrate knowledge of general shop fire safety procedures and regulations.		
J CR 1.2.01	Fire Safety	Demonstrate proper use of fire extinguishers.		
J CR 1.2.02	Fire Safety	Demonstrate knowledge of facility fire evacuation plan.		
J CR 1.2.03	Fire Safety	Collect and properly store hazardous liquids in OSHA-approved safety containers.		
J CR 1.2.04	Fire Safety	Use only approved cleaning fluids and equipment to clean components.		
J CR 1.2.05	Fire Safety	Store all combustible materials in approved safety containers.		
J CR 1.2.06	Fire Safety	Never allow sparks or flames near batteries.		
J CR 1.2.07	Fire Safety	Demonstrate knowledge of all combustible liquids and gasses (i.e., fuels, solvents, batteries).		
J CR 1.2.08	Fire Safety	Demonstrate the safe handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.		
J CR 2	STRUCTURAL ANALYSIS AND DAMAGE REPAIR			
J CR 2.1.01	Frame	Diagnose and measure structural damage using tram and self-centering gauges according to manufacturing specifications.		
J CR 2.1.02	Frame	Analyze, straighten and align mash (collapse) damage.		
J CR 2.1.03	Frame	Inspect, straighten and align sag damage.		
J CR 2.1.04	Frame	Analyze, straighten and align side damage.		
J CR 2.1.05	Frame	Examine, straighten and align twist damage.		
J CR 2.1.06	Frame	Analyze, straighten and align diamond frame damage.		
J CR 2.1.07	Frame	Restore corrosion protection to repaired or replaced frame areas.		
J CR 2.1.08	Frame	Analyze and identify misaligned or damaged steering, suspension and powertrain components that can cause vibration, steering, and wheel alignment problems.		
J CR 2.1.09	Frame	Diagnose and measure structural damage using a universal measuring system (mechanical, electrical, laser).		
J CR 2.2.01	Inspection/ Repair	Identify misaligned or damaged steering, suspension, and powertrain components that can cause vibration, steering, and chassis alignment problems; realign or replace in accordance with vehicle manufacturer's specifications/procedures.		
J CR 2.2.02	Inspection/ Repair	Diagnose and measure unibody damage using tram and self-centering gauges according to industry specifications.		
J CR 2.2.03	Inspection/ Repair	Diagnose and measure unibody vehicles using a universal measuring system (mechanical, electronic, laser).		
J CR 2.2.04	Inspection/ Repair	Straighten and align cowl assembly.		
J CR 2.2.05	Inspection/ Repair	Straighten and align roof rails/headers and roof panels.		
J CR 2.2.06	Inspection/ Repair	Straighten and align hinge and lock pillars.		
J CR 2.2.07	Inspection/ Repair	Straighten and align vehicle openings, floor pans, and rocker panels.		
J CR 2.2.08	Inspection/ Repair	Straighten and align quarter panels, wheelhouse assemblies.		
J CR 2.2.09	Inspection/ Repair	Straighten and align rear body sections (including rails and suspension/powertrain mounting points).		
J CR 2.2.10	Inspection/ Repair	Straighten and align front-end sections (aprons, strut towers, upper and lower rails, steering, and suspension/powertrain mounting points, etc.).		
J CR 2.3.01	Glass	Inspect vehicles for glass damage.		
J CR 2.3.02	Glass	Determine the manufacturer's specifications for glass window replacement.		
J CR 2.4.01	Welding/ Cutting	Identify weldable and non-weldable materials used in collision repair.		
J CR 2.4.02	Welding/ Cutting	Weld and cut high-strength steel, and other steels using manufacturer's specifications/procedures.		
J CR 2.4.03	Welding/ Cutting	Determine the correct GMAW (MIG) welder type, electrode, wire type, diameter and gas to be used in a specific welding situation.		
J CR 2.4.04	Welding/ Cutting	Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.		

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J CR 2.4.05	Welding/ Cutting	Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation according to manufacturer's/industry specifications.		
J CR 2.4.06	Welding/ Cutting	Perform the following welds: continuous, stitch, tack, plug, butt weld with and without backing, and lap joints.		
J CR 2.4.07	Welding/ Cutting	Perform visual and destructive tests on each weld type.		
J CR 2.4.08	Welding/ Cutting	Identify the causes of various welding defects; make necessary adjustments.		
J CR 2.4.09	Welding/ Cutting	Identify cutting process for different materials and locations in accordance with manufacturer's procedures; perform cutting operation.		
J CR 2.4.10	Welding/ Cutting	Identify different methods of attaching structural components (squeeze type resistance spot welding (STRSW), riveting, structural adhesive, silicone bronze, etc.).		
J CR 2.4.11	Welding/ Cutting	Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary and clamp as required.		
J CR 3	NONSTRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)			
J CR 3.1.01	Preparation	Inspect, remove, store, and replace exterior trim and moldings.		
J CR 3.1.02	Preparation	Evaluate, remove, store, and replace interior trim and components.		
J CR 3.1.03	Preparation	Inspect, remove, store, and replace nonstructural body panels and components that may interfere with or be damaged during repair.		
J CR 3.1.04	Preparation	Evaluate, remove, store, and replace all vehicle mechanical and electrical components that may interfere with or be damaged during repair.		
J CR 3.1.05	Preparation	Remove corrosion protection, undercoatings, sealers, and other protective coatings necessary to perform repairs.		
J CR 3.1.06	Preparation	Identify, remove, and replace repairable plastics and other components that are recommended for off-vehicle repair.		
J CR 3.1.07	Preparation	Apply environmental practices associated with vehicle components and systems such as substrates, fluids, refrigerants, batteries, etc.		
J CR 3.2.01	Panels	Scrutinize, remove and replace bolted, bonded, or welded steel panel or panel assemblies.		
J CR 3.2.02	Panels	Inspect, remove, replace, and align hood, hood hinges, and hood latch.		
J CR 3.2.03	Panels	Examine, remove, replace, and align deck lid, lid hinges, and lid latch.		
J CR 3.2.04	Panels	Inspect, remove, replace, and align doors, tailgates, hatches, lift gates, latches, hinges, and related hardware.		
J CR 3.2.05	Panels	Check, remove, replace, and align bumper bars, covers, reinforcement, guards, isolators, and mounting hardware.		
J CR 3.2.06	Panels	Inspect, remove, replace and align front fenders, headers, and other panels.		
J CR 3.2.07	Panels	Straighten and rough-out contours of damaged panels to a suitable condition for body filling or metal finishing using power tools, hand tools, and weld-on pull attachments.		
J CR 3.2.08	Panels	Diagnose and repair water leaks, dust leaks, and wind noise.		
J CR 3.3.01	Finishing/ Filling	Locate and reduce surface irregularities on a damaged body panel.		
J CR 3.3.02	Finishing/ Filling	Demonstrate hammer and dolly techniques.		
J CR 3.3.03	Finishing/ Filling	Apply body filler; shape during curing.		
J CR 3.3.04	Finishing/ Filling	Rough sand cured body filler to contour; finish sand.		
J CR 3.3.05	Finishing/ Filling	Cold shrink stretched panel areas to proper contour.		
J CR 3.4.01	Glass/ Hardware	Diagnose and repair water leaks, dust leaks, and wind noises; inspect, repair, and replace weatherstripping.		
J CR 3.5.01	Welding/ Cutting	Identify weldable and non-weldable materials used in collision repair.		
J CR 3.5.02	Welding/ Cutting	Determine the correct welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation.		
J CR 3.5.03	Welding/ Cutting	Use the proper angle of the gun to the joint and direction of gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions.		
J CR 3.5.04	Welding/ Cutting	Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp as required.		
J CR 3.5.05	Welding/ Cutting	Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation according to manufacturer's/industry specifications.		
J CR 3.5.06	Welding/ Cutting	Perform the following welds: continuous, stitch, tack, plug, butt weld with and without backing, and lap joints.		
J CR 3.5.07	Welding/ Cutting	Perform visual and destructive tests on each weld type.		
J CR 3.5.08	Welding/ Cutting	List the causes of various welding defects; make necessary adjustments.		
J CR 3.5.09	Welding/ Cutting	Identify cutting process for different materials and locations in accordance with manufacturer's procedures; perform cutting operation.		
J CR 3.6.01	Plastics	Identify the types of plastics repair procedures; clean and prepare the surface of plastic parts.		
J CR 3.6.02	Plastics	Repair rigid, semi-rigid, and flexible plastic panels according to manufacturer's/industry specifications.		
J CR 4	MECHANICAL AND ELECTRICAL COMPONENTS			
J CR 4.1.01	Suspension/ Steering	Identify suspension system fasteners that should not be reused.		
J CR 4.1.02	Suspension/ Steering	Inspect, remove and replace steering linkage damper.		
J CR 4.1.03	Suspension/ Steering	Inspect, remove and replace stabilizer bar bushings brackets, and links.		
J CR 4.1.04	Suspension/ Steering	Examine, remove and replace MacPherson strut cartridge or assembly, upper bearing, and mount.		

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J CR 4.1.05	Suspension/ Steering	Inspect, remove, and replace suspension system leaf spring(s), leaf spring insulators (silencers), shackles, brackets, bushings, and mounts.		
J CR 4.1.06	Suspension/ Steering	Check axle assembly for damage and misalignment.		
J CR 4.1.07	Suspension/ Steering	Inspect, remove and replace shock absorbers.		
J CR 4.1.08	Suspension/ Steering	Measure vehicle ride height; determine repairs needed.		
J CR 4.1.09	Suspension/ Steering	Analyze steering column damage, looseness, and binding problems (including tilt mechanisms); determine repairs needed.		
J CR 4.1.10	Suspension/ Steering	Diagnose manual and power steering gear (non-rack and pinion type) noises, binding, uneven turning effort, looseness, hard steering, and fluid leakage problems; determine repairs needed.		
J CR 4.1.11	Suspension/ Steering	Diagnose power rack and pinion steering gear noises, vibration, looseness, hard steering, and fluid leakage problems, ensure proper mounting location; determine repairs needed.		
J CR 4.1.12	Suspension/ Steering	Diagnose non-MacPherson front and rear suspension system noises and body-sway problems; determine repairs needed.		
J CR 4.1.13	Suspension/ Steering	Diagnose MacPherson strut suspension system noises and body sway problems; determine repairs needed.		
J CR 4.1.14	Suspension/ Steering	Analyze vehicle wandering, pulling, hard steering, bump steer, memory steering, torque steering, and steering return problems; determine repairs needed.		
J CR 4.1.15	Suspension/ Steering	Visually check front and rear wheel camber on adjustable and non-adjustable suspension systems; determine repairs needed.		
J CR 4.1.16	Suspension/ Steering	Check caster on adjustable and non-adjustable suspension systems; determine repairs needed.		
J CR 4.1.17	Suspension/ Steering	Check for front wheel setback; determine repairs needed.		
J CR 4.1.18	Suspension/ Steering	Measure wheel, tire, axle, and hub run-out; determine repairs needed.		
J CR 4.2.01	Electrical Components	Check voltages in electrical wiring circuits with a DMM (digital multimeter).		
J CR 4.2.02	Electrical Components	Repair electrical circuits, wiring, and connectors according to manufacturer's specifications.		
J CR 4.2.03	Electrical Components	Examine, remove and replace power seat, motors, linkages, cables, etc.		
J CR 4.2.04	Electrical Components	Inspect, remove and replace components of electric door hatch/trunk lock.		
J CR 4.2.05	Electrical Components	Inspect, remove and replace components of power antenna circuits.		
J CR 4.2.06	Electrical Components	Examine, clean, and repair or replace battery cables, connectors, and clamps.		
J CR 4.2.07	Electrical Components	Verify alignment, adjust, and replace generator (alternator) drive belts, pulleys, and fans.		
J CR 4.2.08	Electrical Components	Remove and replace generator (alternator).		
J CR 4.2.09	Electrical Components	Demonstrate the proper self-grounding procedures for handling electrical components.		
J CR 4.2.10	Electrical Components	Dispose of batteries and battery acid according to local, state, and federal requirements.		
J CR 4.2.11	Electrical Components	Perform slow/fast battery charge in accordance with manufacturer's recommendations.		
J CR 4.2.12	Electrical Components	Check operation of exterior lighting; determine needed repairs.		
J CR 4.2.13	Electrical Components	Aim headlamp assemblies and fog/driving lamps; determine needed repairs.		
J CR 4.2.14	Electrical Components	Remove and replace horn(s); check operation.		
J CR 4.2.15	Electrical Components	Check the operation of windshield wiper/washer system.		
J CR 4.2.16	Electrical Components	Verify proper operation of power side windows and power tailgate window.		
J CR 4.2.17	Electrical Components	Check operation of electrically heated mirrors, windshields, back lights, panels, etc.; repair as necessary.		
J CR 4.3.01	Brakes	Inspect brake lines and fittings for leaks, dents, kinks, rust, cracks or wear; tighten loose fittings and supports; replace brake lines (double flare and ISO types), hoses, fittings, and supports.		
J CR 4.3.02	Brakes	Inspect flexible brake hoses for leaks, kinks, cracks, bulging or wear; remove and replace hoses; tighten loose fittings and supports.		
J CR 4.3.03	Brakes	Bleed (manual, pressure, vacuum or surge) hydraulic brake system in accordance with manufacturer's procedures.		
J CR 4.3.04	Brakes	Remove and reinstall caliper assembly.		
J CR 4.3.05	Brakes	Depressurize ABS hydraulic or electronic system according to manufacturer's procedures.		
J CR 4.3.06	Brakes	Identify the proper procedures for handling brake dust.		
J CR 4.3.07	Brakes	Check for bent or damaged brake system components.		
J CR 4.4.01	Air Conditioning	Identify and comply with environmental concerns relating to refrigerants and coolants.		
J CR 4.4.02	Air Conditioning	Maintain and verify correct operation of certified refrigerant recovery and recharging equipment.		
J CR 4.4.03	Air Conditioning	Locate and identify A/C system service ports.		
J CR 4.4.04	Air Conditioning	Identify and recover refrigerant from A/C system.		
J CR 4.4.05	Air Conditioning	Recycle refrigerant in accordance with EPA regulations.		
J CR 4.4.06	Air Conditioning	Test recycled refrigerant for non-condensable gases.		
J CR 4.4.07	Air Conditioning	Evacuate A/C system; check for leaks.		
J CR 4.4.08	Air Conditioning	Recharge A/C system with refrigerant; perform leak test.		
J CR 4.4.09	Air Conditioning	Identify oil type and maintain correct amount in A/C system according to manufacturer's specifications.		
J CR 4.4.10	Air Conditioning	Inspect, adjust, and replace A/C compressor drive belts; check pulley alignment.		
J CR 4.4.11	Air Conditioning	Check, test, and replace A/C system condenser and mounts.		
J CR 4.4.12	Air Conditioning	Examine and replace receiver/drier or accumulator/drier.		
J CR 4.4.13	Air Conditioning	Inspect and repair A/C component wiring.		

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J CR 4.5.01	Cooling Systems	Check and replace engine cooling and heater system hoses and belts as needed.		
J CR 4.5.02	Cooling Systems	Inspect, test, remove, and replace radiator, pressure cap, coolant recovery system, and water pump.		
J CR 4.5.03	Cooling Systems	Recover, refill, and bleed system with proper coolant and check level of protection; leak test system and dispose of materials in accordance with EPA specifications.		
J CR 4.5.04	Cooling Systems	Remove and replace fan (both electrical and mechanical), fan pulley, fan clutch, and fan shroud.		
J CR 4.5.05	Cooling Systems	Inspect, remove, and replace auxiliary oil/fluid coolers; check oil levels.		
J CR 4.5.06	Cooling Systems	Examine, remove, and replace electric fan sensors; check operation.		
J CR 4.6.01	Drive Train	Remove, replace, and adjust shift or clutch linkage as required.		
J CR 4.6.02	Drive Train	Remove, replace, and adjust cables or linkages for throttle valve (TV), kick-down, and accelerator pedal.		
J CR 4.6.03	Drive Train	Remove and replace electronic sensors, wires, and connectors.		
J CR 4.7.01	Fuel Intake/ Exhaust	Inspect, remove and replace fuel tank, fuel tank filter, fuel cap, fuel filler hose, and inertia switch; inspect and replace fuel lines and hoses; check fuel for contaminants.		
J CR 4.7.02	Fuel Intake/ Exhaust	Check, remove and replace engine components of air intake systems.		
J CR 4.7.03	Fuel Intake/ Exhaust	Inspect, remove and replace canister, filter, vent, and purge lines of fuel vapor (EVAP) control systems.		
J CR 4.8.01	Restraint Systems	Examine, remove, and replace seatbelt and shoulder harness assembly and components in accordance with manufacturer's specifications/procedures.		
J CR 4.8.02	Restraint Systems	Check restraint system mounting areas for damage; repair in accordance with manufacturer's specifications/procedures.		
J CR 4.8.03	Restraint Systems	Inspect, remove, and replace seatbelt and shoulder harness assembly and components in accordance with manufacturer's specifications/procedures.		
J CR 4.8.04	Restraint Systems	Inspect restraint system mounting areas for damage in accordance with manufacturer's specifications/procedures.		
J CR 4.8.05	Restraint Systems	Verify proper operation of seatbelt in accordance with manufacturer's specifications/procedures.		
J CR 4.8.06	Restraint Systems	Inspect, remove and replace track and drive assembly, lap retractor, torso retractor, inboard buckle-lap retractor, tensioners and knee bolster (blocker) in accordance with manufacturer's specifications/procedures.		
J CR 4.8.07	Restraint Systems	Verify proper operation of seatbelt in accordance with manufacturer's specifications/procedures.		
J CR 4.8.08	Restraint Systems	Disarm SRS in accordance with manufacturer's specifications/procedures.		
J CR 4.8.09	Restraint Systems	Inspect, remove and replace sensors and wiring in accordance with manufacturer's specifications/procedures; ensure sensor orientation.		
J CR 5	PAINTING AND REFINISHING PROCEDURES			
J CR 5.1.01	Health Safety Environmental	Inspect spray equipment to ensure compliance with applicable regulations, and for safety and cleanliness hazards.		
J CR 5.1.02	Health Safety Environmental	Choose and use the NIOSH approved personal sanding respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation.		
J CR 5.1.03	Health Safety Environmental	Select and utilize the NIOSH approved personal painting/refinishing respirator system. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation.		
J CR 5.1.04	Health Safety Environmental	Select and use the proper personal safety equipment for various shop operations (i.e., gloves, suits, hoods, eye and ear protection, etc.).		
J CR 5.2.01	Surface Preparation	Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation.		
J CR 5.2.02	Surface Preparation	Inspect and identify substrate, type of finish and surface condition; develop and discuss a plan for refinishing using a total product system.		
J CR 5.2.03	Surface Preparation	Prepare paint finish in accordance with manufacturer's recommendations.		
J CR 5.2.04	Surface Preparation	Apply suitable metal treatment or primer in accordance with total product systems.		
J CR 5.2.05	Surface Preparation	Mix primer, primer-surfacer or primer-sealer.		
J CR 5.2.06	Surface Preparation	Apply primer onto surface of repaired area.		
J CR 5.2.07	Surface Preparation	Apply two-component finishing filler to minor surface imperfections.		
J CR 5.2.08	Surface Preparation	Dry or wet sand area to which primer-surfacer has been applied.		
J CR 5.2.09	Surface Preparation	Dry sand area to which two-component finishing filler has been applied.		
J CR 5.2.10	Surface Preparation	Apply suitable sealer to the area being refinished when sealing is needed or desirable.		
J CR 5.2.11	Surface Preparation	Scuff sand to remove nibs or imperfections from a sealer.		
J CR 5.2.12	Surface Preparation	Apply stone chip resistant coating.		
J CR 5.2.13	Surface Preparation	Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas.		
J CR 5.2.14	Surface Preparation	Prepare adjacent panels for blending.		
J CR 5.3.01	Spraying	Check and adjust spray gun operation for HVLP (high volume, low pressure) or LVLP (low volume, low pressure) guns.		
J CR 5.3.02	Spraying	Set-up (fluid needle, nozzle, and cap), adjust, and test spray gun using fluid, air, and pattern control valves.		
J CR 5.4.01	Paints	Shake, stir, reduce, catalyze/activate, and strain paint according to manufacturer's procedures.		

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J CR 5.4.02	Paints	Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied.		
J CR 5.4.03	Paints	Select product, apply on test panel and let-down panel in accordance with manufacturer's recommendations; check for color match.		
J CR 5.4.04	Paints	Apply single stage topcoat for refinishing.		
J CR 5.4.05	Paints	Apply basecoat/clearcoat for overall refinishing.		
J CR 5.4.06	Paints	Denib, buff, and polish finishes where necessary.		
J CR 5.4.07	Paints	Refinish rigid, semi-rigid and flexible plastic parts.		
J CR 5.4.08	Paints	Identify and mix paint using a formula.		
J CR 5.4.09	Paints	Identify poor hiding colors; determine necessary action.		
J CR 5.4.10	Paints	Verify alternative color formula to achieve a blendable match.		
J CR 5.5.01	Paint Defects	Identify blistering (rising of the paint surface); determine the cause(s) and correct the condition.		
J CR 5.5.02	Paint Defects	Identify blushing (milky or hazy formation); determine the cause(s) and correct the condition.		
J CR 5.5.03	Paint Defects	Identify a dry spray appearance in the paint surface; determine the cause(s) and correct the condition.		
J CR 5.5.04	Paint Defects	Identify the presence of fish-eyes (crater-like openings) in the finish; determine the cause(s) and correct the condition.		
J CR 5.5.05	Paint Defects	Identify lifting; determine the cause(s) and correct the condition.		
J CR 5.5.06	Paint Defects	Identify clouding (mottling and streaking in metallic finishes); determine the cause(s) and correct the condition.		
J CR 5.5.07	Paint Defects	Check for orange peel; determine the cause(s) and correct the condition.		
J CR 5.5.08	Paint Defects	Check for overspray; determine the cause(s) and correct the condition.		
J CR 5.5.09	Paint Defects	Identify solvent popping in freshly painted surface; determine the cause(s) and correct the condition.		
J CR 5.5.10	Paint Defects	Visually identify sags and runs in paint surface; determine the cause(s) and correct the condition.		
J CR 5.5.11	Paint Defects	Identify sanding marks (sandscratch swelling); determine the cause(s) and correct the condition.		
J CR 5.5.12	Paint Defects	Identify contour mapping (shrinking and splitting) while finish is drying; determine the cause(s) and correct the condition.		
J CR 5.5.13	Paint Defects	Determine color difference (off-shade), the cause(s) and correct the condition.		
J CR 5.5.14	Paint Defects	Identify tape tracking; determine the cause(s) and correct the condition.		
J CR 5.5.15	Paint Defects	Identify low gloss condition; determine the cause(s) and correct the condition.		
J CR 5.5.16	Paint Defects	Test for poor adhesion; determine the cause(s) and correct the condition.		
J CR 5.5.17	Paint Defects	Identify paint cracking (crowsfeet or line-checking, micro-checking, etc.), determine the cause(s) and correct the condition.		
J CR 5.5.18	Paint Defects	Spot corrosion; determine the cause(s) and correct the condition.		
J CR 5.5.19	Paint Defects	Identify dirt or dust in the paint surface; determine the cause(s) and correct the condition.		
J CR 5.5.20	Paint Defects	Look at water spotting; determine the cause(s) and correct the condition.		
J CR 5.5.21	Paint Defects	Physically identify finish damage caused by bird droppings, tree sap, and other natural causes; correct the condition.		
J CR 5.5.22	Paint Defects	Identify finish damage caused by airborne contaminants (acids, soot, and other industrial-related causes); correct the condition.		
J CR 5.5.23	Paint Defects	Identify die-back conditions (dulling of the paint film showing haziness); determine the cause(s) and correct the condition.		
J CR 5.5.24	Paint Defects	Check for chalking (oxidation); determine the cause(s) and correct the condition.		
J CR 5.5.25	Paint Defects	Identify bleed-through (staining); determine the cause(s) and correct the condition.		
J CR 5.5.26	Paint Defects	Identify pinholing; determine the cause(s) and correct the condition.		
J CR 5.5.27	Paint Defects	Visually identify buffing-related imperfections (swirl marks, wheel burns); correct the condition. Identify pigment flotation (color change through film build); determine the cause(s) and correct the condition.		
J CR 5.5.28	Paint Defects	Identify pigment flotation (color change through film build); determine the cause(s) and correct the condition.		
J CR 5.6.01	Detailing	Apply decals, transfers, tapes, woodgrains, pinstripes (painted and taped), etc.		
J CR 6	ESTIMATING			
J CR 6.1.01	Damage Reports	Explain the areas of a handwritten damage report.		
J CR 6.2.01	Repair Estimating	Explain the difference between pre-existing damage and collision-related damage.		
J CR 6.2.02	Repair Estimating	List the different labor categories (structural and mechanical) and define each.		
J CR 6.2.03	Repair Estimating	Define sublet and identify common examples.		
J CR 6.2.04	Repair Estimating	Explain refinishing operations including paint and materials.		
J CR 6.2.05	Repair Estimating	Define overlap and identify common examples.		
J CR 6.2.06	Repair Estimating	List detailing and identify common examples.		
J CR 6.2.07	Repair Estimating	Define "included" and "not included" operations and identify examples of each.		
J CR 6.2.08	Repair Estimating	Define additional operations and provide examples.		
J CR 6.2.09	Repair Estimating	Compare the difference between flat rate and labor rate and where these rates are typically found.		
J CR 6.3.01	Finishing Types	Explain the purpose of seam sealers and identify the different types and characteristics.		

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J CR 6.3.02	Finishing Types	Identify the various types of finishes and define the differences between them.		
J CR 6.3.03	Finishing Types	Look at a finish and identify previously repaired areas and environmental changes.		
J CR 6.3.04	Finishing Types	List reasons for blending and how it may affect paint warranties.		
J CR 6.3.05	Finishing Types	Explain why corrosion protection must be reapplied during the repair.		
J CR 6.3.06	Finishing Types	Calculate surface refinishing labor units and identify included and not included refinishing operations.		
J CR 6.4.01	Information	Identify information that should be obtained before beginning the damage analysis.		
J CR 6.4.02	Information	List different types of labels and plates required to comply with local and national regulations.		
J CR 6.4.03	Information	Know the location of the paint code, finish identification information, and vehicle option label.		
J CR 6.4.04	Information	Explain the purpose of anti-theft labels and replacement part labels and identify common parts that display these labels.		
J CR 6.5.01	Reports	Record the proper vehicle information.		
J CR 6.5.02	Reports	Calculate totals and subtotals of the damage estimate.		
J CR 6.5.03	Reports	Include additional costs in the damage estimate.		
J CR 6.5.04	Reports	Define hidden damage.		
J CR 6.5.05	Reports	List supplements and explain why they can be sources of conflict.		
J CR 7	EMPLOYABILITY SKILLS			
J CR 7.1.01	Problem Solving	Solve a collision and/or refinishing problem using the appropriate steps to achieve pre-accident condition.		
J CR 7.1.02	Problem Solving	Demonstrate brainstorming techniques.		
J CR 7.1.03	Problem Solving	Examine and explain the advantages and disadvantages of alternative solutions to one or more problems.		
J CR 7.1.04	Problem Solving	Create an action plan based upon a solution to a work-related problem.		
J CR 7.1.05	Problem Solving	Identify the benefits of solving a work-related problem.		
J CR 7.2.01	Critical Thinking	Identify and explain the essential elements of the critical-thinking process.		
J CR 7.2.02	Critical Thinking	Demonstrate critical-thinking skills necessary in the workplace.		
J CR 7.2.03	Critical Thinking	Explain how emotional thinking and logical thinking affect decision making in the workplace.		
J CR 7.2.04	Critical Thinking	Explain the difference between reliable and unreliable observations and statements of facts.		
J CR 7.2.05	Critical Thinking	Recognize patterns or relationships through observation and discovery.		
J CR 7.3.01	Speak, Write, Listen	Communicate thoughts, ideas, and information in writing as required for warranty and supplemental repair orders.		
J CR 7.3.02	Speak, Write, Listen	Explain the benefits of effective communication skills in the workplace.		
J CR 7.3.03	Speak, Write, Listen	Effectively interpret and respond to verbal and nonverbal messages.		
J CR 7.3.04	Speak, Write, Listen	Effectively communicate thoughts, ideas and information in writing.		
J CR 7.3.05	Speak, Write, Listen	Organize ideas and communicate orally; is able to effectively demonstrate job skills to others.		
J CR 7.3.06	Speak, Write, Listen	Locate, understand and interpret written information in documents such as manuals, schedules and repair orders.		
J CR 7.3.07	Speak, Write, Listen	Organize information into the appropriate format in accordance with standard practices, which includes prewriting, drafting, proofreading, editing/revising, and preparing final copy.		
J CR 7.3.08	Speak, Write, Listen	Identify common communication barriers and methods for improving communication.		
J CR 7.4.01	Technology	Demonstrate ability to utilize other input devices.		
J CR 7.4.02	Technology	Demonstrate ability to utilize various electronic research methods.		
J CR 7.4.03	Technology	Demonstrate knowledge of the basic technology systems currently available and how they apply to your field (i.e., word processing, spreadsheets, multimedia applications and database).		
J CR 7.4.04	Technology	Investigate and explain the use, benefits, and costs of technological developments in workplace and school.		
J CR 7.4.05	Technology	Demonstrate routine maintenance and repair of technological equipment.		
J CR 7.5.01	Leadership and Teamwork	Work cooperatively with others when given a group project.		
J CR 7.5.02	Leadership and Teamwork	Explain traits necessary to effectively lead and influence individuals and groups.		
J CR 7.5.03	Leadership and Teamwork	Demonstrate appropriate attitudes and behaviors for effective leadership.		
J CR 7.5.04	Leadership and Teamwork	Participate in the implementation of a group's decision and evaluate the results.		
J CR 7.5.05	Leadership and Teamwork	Demonstrate the qualities of an effective leader and team member.		
J CR 7.5.06	Leadership and Teamwork	Display ownership and confidence in work.		
J CR 7.6.01	Ethics	Develop personal work ethics through work experience.		
J CR 7.6.02	Ethics	Describe the importance of ethics practiced in the workplace.		
J CR 7.6.03	Ethics	Demonstrate regular attendance, promptness, and the willingness to follow instructions and complete an assigned task.		
J CR 7.6.04	Ethics	Demonstrate appropriate personal and professional attitudes and behaviors.		
J CR 7.6.05	Ethics	Maintain a safe, clean, and organized work area.		
J CR 7.6.06	Ethics	Demonstrate awareness of legal responsibilities related to individual performance, safety and customer satisfaction.		
J CR 7.6.07	Ethics	Demonstrate knowledge of various types of harassment.		

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J CR 7.7.01	Workplace	Identify and organize the human resources needed to complete a job assignment.		
J CR 7.7.02	Workplace	Identify and organize the material resources and space requirements needed to complete a job assignment.		
J CR 7.7.03	Workplace	Effectively use technology at its highest level to complete a job assignment.		
J CR 7.7.04	Workplace	Demonstrate cooperation and leadership in a team at school or in a workplace setting.		
J CR 7.7.05	Workplace	Use the basic components of effective time management.		
J CR 7.7.06	Workplace	Recognize the need for management skills in the workplace with regard to stress, anger management and substance abuse.		
J CR 7.7.07	Workplace	Estimate costs and prepare a detailed work order.		
	Workplace	Develop a time schedule and prioritized task list to complete a job assignment.		
J CR 7.8.01	Career	Prepare a job application.		
J CR 7.8.02	Career	Prepare a personal résumé.		
J CR 7.8.03	Career	Complete a personal aptitude and interest inventory.		
J CR 7.8.04	Career	Participate in a job interview.		
J CR 7.8.05	Career	Establish short-term career goals.		
J CR 7.8.06	Career	Establish long-term career goals.		
J CR 7.8.07	Career	Use the Montana Career Information System (CIS) or a similar computer-based program to research careers in a chosen field.		
J CR 7.8.08	Career	Participate in an organized job-shadowing activity.		
J CR 7.8.09	Career	Participate in a community service project.		
J CR 7.8.10	Career	Construct a career portfolio.		
J CR 7.9.01	Retention	Describe the importance of a portfolio.		
J CR 7.9.02	Retention	Identify options for lifelong learning.		
J CR 7.9.03	Retention	Identify interpersonal skills needed for job retention.		
J CR 7.9.04	Retention	Identify jobs with opportunity for advancement.		
J CR 7.9.05	Retention	Describe the importance of career planning.		

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M CR 1	SAFETY			
M CR 1.1.01	General Rules	Design a general shop safety improvement plan.		
M CR 1.2.01	Fire Safety	Design a fire safety improvement plan.		
M CR 2	STRUCTURAL ANALYSIS AND DAMAGE REPAIR			
M CR 2.1.01	Frame	Remove and replace damaged structural components according to manufacturer's specifications/procedures.		
M CR 2.2.01	Inspection/ Repair	Remove and replace damaged sections of structural steel body panels in accordance with manufacturer's specifications/procedures.		
M CR 2.2.02	Inspection/ Repair	Determine the extent of damage to aluminum structural components; repair, weld, or replace in accordance with manufacturer's specifications/procedures.		
M CR 2.3.01	Glass	Remove and reinstall or replace fixed glass (heated and non-heated) using manufacturer's specifications/ procedures and recommended materials.		
M CR 2.3.02	Glass	Remove and reinstall or replace modular glass according to manufacturer's specifications, procedures and recommendations.		
M CR 2.4.01	Welding/ Cutting	Weld and cut aluminum according to manufacturer's specifications.		
M CR 2.4.02	Welding/ Cutting	Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode stickout, voltage, polarity, flow rate, and wire-feed speed required for the material being welded.		
M CR 2.4.03	Welding/ Cutting	Identify the cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.		
M CR 3	NONSTRUCTURAL ANALYSIS AND DAMAGE REPAIR (BODY COMPONENTS)			
M CR 3.1.01	Preparation	Apply undercoating to protect underside of vehicle.		
M CR 3.1.02	Preparation	Apply seam sealer to appropriate areas after panel replacement.		
M CR 3.2.01	Panels	Determine the extent of damage to aluminum body panels; repair or replace in accordance with manufacturer's specifications.		
M CR 3.2.02	Panels	Weld damaged or torn steel body panels; repair broken welds.		
M CR 3.2.03	Panels	Replace door skins according to manufacturer's procedures.		
M CR 3.2.04	Panels	Perform panel bonding according to manufacturer's specifications.		
M CR 3.3.01	Finishing/ Filling	Heat shrink stretched panel areas to proper contour according to manufacturer's specifications.		
M CR 3.4.01	Glass/ Hardware	Inspect, adjust, repair or replace window regulators, run channels, glass, power mechanisms, and related controls.		
M CR 3.5.01	Welding/ Cutting	Weld and cut aluminum using manufacturer's specifications/procedures.		
M CR 3.5.02	Welding/ Cutting	Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode stick-out, voltage, polarity, flow rate, and wire-feed speed required for the material being welded.		
M CR 3.5.03	Welding/ Cutting	Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments.		
M CR 3.6.01	Plastics	Remove or repair damaged areas from rigid exterior sheet-molded compound (SMC) panels.		
M CR 3.6.02	Plastics	Replace bonded sheet-molded compound (SMC) body panels; straighten or align panel supports.		
M CR 4	MECHANICAL AND ELECTRICAL COMPONENTS			
M CR 4.1.01	Suspension/ Steering	Remove, replace, inspect or adjust power steering pump, pulleys, belts, hoses, fittings and pump mounts.		
M CR 4.1.02	Suspension/ Steering	Remove and replace power steering gear (non-rack and pinion type).		
M CR 4.1.03	Suspension/ Steering	Remove and replace power rack and pinion steering gear; inspect and replace mounting bushings, tie rod ends, bellow boots, and brackets; ensure proper mounting location.		
M CR 4.1.04	Suspension/ Steering	Inspect and adjust (where applicable) steering linkage geometry (attitude/parallelism).		
M CR 4.1.05	Suspension/ Steering	Inspect and replace pitman arm.		
M CR 4.1.06	Suspension/ Steering	Examine and replace relay (center link/intermediate) rod.		
M CR 4.1.07	Suspension/ Steering	Check, remove and replace idler arm and mountings.		
M CR 4.1.08	Suspension/ Steering	Inspect, remove and replace tie rod sleeves, clamps, and tie rod ends.		
M CR 4.1.09	Suspension/ Steering	Inspect, remove and replace upper and lower control arms.		
M CR 4.1.10	Suspension/ Steering	Examine, remove and replace upper and lower control arm bushings, shafts and rebound bumpers.		
M CR 4.1.11	Suspension/ Steering	Inspect, remove and replace upper and lower ball joints.		
M CR 4.1.12	Suspension/ Steering	Inspect, remove and replace steering knuckle/spindle/hub assemblies (including bearings, races, seals, etc.).		
M CR 4.1.13	Suspension/ Steering	Examine, remove and replace front suspension system coil springs and spring insulators (silencers).		
M CR 4.1.14	Suspension/ Steering	Examine, remove, replace, and adjust suspension system torsion bars, and inspect mounts.		
M CR 4.1.15	Suspension/ Steering	Inspect, remove, and replace rear suspension system transverse links, control arms, stabilizer bars, bushings, and mounts.		
M CR 4.1.16	Suspension/ Steering	Diagnose, inspect, adjust, repair or replace active suspension systems and associated lines and fittings.		
M CR 4.1.17	Suspension/ Steering	Inspect, remove, replace, and align front and rear frame (cradles/sub).		
M CR 4.1.18	Suspension/ Steering	Inspect, remove and replace steering shaft U-joint(s), flexible coupling(s), collapsible columns and steering wheels.		
M CR 4.1.19	Suspension/ Steering	Adjust front and rear wheel camber on suspension systems with camber adjustments.		
M CR 4.1.20	Suspension/ Steering	Adjust caster on suspension systems with caster adjustments.		

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M CR 4.1.21	Suspension/ Steering	Check and adjust wheel toe including centering steering wheel; determine needed adjustment or repair.		
M CR 4.1.22	Suspension/ Steering	Identify toe-out-on-turns (turning radius) related problems; determine needed repairs.		
M CR 4.1.23	Suspension/ Steering	Identify SAI (steering axis inclination), included angle, and KPI (king pin inclination) related problems; determine needed repairs.		
M CR 4.1.24	Suspension/ Steering	Identify thrust angle related problems; determine needed repairs		
M CR 4.1.25	Suspension/ Steering	Diagnose wheel/tire vibration, shimmy, and tramp (wheel hop) problems; determine needed repairs.		
M CR 4.2.01	Electrical Components	Check for voltage drop in the electrical wiring circuits and components with a DMM (digital multimeter).		
M CR 4.2.02	Electrical Components	Inspect, test, and replace fusible links, circuit breakers, and fuses.		
M CR 4.2.03	Electrical Components	Identify programmable electrical/electronic components; record data for reprogramming before disconnecting battery.		
M CR 4.2.04	Electrical Components	Inspect, test, and repair or replace switches, relays, bulbs, sockets, connectors, and wires of all interior and exterior light circuits.		
M CR 4.2.05	Electrical Components	Inspect, remove and replace components of keyless lock/unlock devices and alarm systems.		
M CR 4.2.06	Electrical Components	Analyze, remove and replace components of electrical sunroof and convertible top.		
M CR 4.2.07	Electrical Components	Check for module communication errors using a scan tool.		
M CR 4.2.08	Electrical Components	Use wiring diagrams during diagnosis of electrical circuit problems.		
M CR 4.3.01	Brakes	Pressure test brake hydraulic system; determine needed repair.		
M CR 4.3.02	Brakes	Adjust brake shoes; remove and reinstall brake drums or drum/hub assemblies and wheel bearings.		
M CR 4.3.03	Brakes	Identify and replace ABS wheel speed sensor components according to manufacturer's specifications.		
M CR 4.4.01	Air Conditioning	Remove and replace A/C compressor; inspect, repair or replace A/C compressor mount.		
M CR 4.4.02	Air Conditioning	Inspect, repair or replace A/C system mufflers, hoses, lines, fittings, and seals.		
M CR 4.5.01	Cooling Systems	Student will safely remove radiator cap, after engine is cooled, preventing injury to technician.		
M CR 4.6.01	Drive Train	Remove and replace powertrain assembly; inspect, replace, and align powertrain mounts.		
M CR 4.6.02	Drive Train	Remove and replace drive axle assembly.		
M CR 4.6.03	Drive Train	Inspect, remove and replace half shafts and axle constant velocity (CV) joints.		
M CR 4.6.04	Drive Train	Inspect, remove and replace drive shafts and universal joints.		
M CR 4.7.01	Fuel Intake/ Exhaust	Inspect, remove and replace exhaust pipes, mufflers, converters, resonators, tail pipes, and heat shields.		
M CR 4.8.01	Restraint Systems	Inspect, remove, replace, and dispose of deployed SRS modules in accordance with manufacturer's specifications/procedures.		
M CR 4.8.02	Restraint Systems	Verify that SRS is operational in accordance with manufacturer's specifications/procedures.		
M CR 4.8.03	Restraint Systems	Inspect, remove, replace, and dispose of non-deployed SRS in accordance with manufacturer's specifications/procedures.		
M CR 4.8.04	Restraint Systems	Diagnose and repair SRS using fault codes and testing equipment.		
M CR 5	PAINTING AND REFINISHING PROCEDURES			
M CR 5.1.01	Health Safety Environmental	Execute a complete spray project in accordance with all industry regulations noting the correct procedures for each step along the way.		
M CR 5.2.01	Surface Preparation	Prepare plastic panels for refinishing.		
M CR 5.3.01	Spraying	Student will strain materials preventing clogging.		
M CR 5.3.02	Spraying	Identify all moving parts of a spray gun.		
M CR 5.4.01	Paints	Apply basecoat/clearcoat for panel blending or partial refinishing to achieve invisible repair.		
M CR 5.4.02	Paints	Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures.		
M CR 5.4.03	Paints	Apply multi-stage (tricoat) coats for panel blending or overall refinishing.		
M CR 5.4.04	Paints	Tint color using formula to achieve a blendable match.		
M CR 5.5.01	Paint Defects	Compare and contrast painting products for effectiveness.		
M CR 5.5.02	Paint Defects	Examine painting work of others and critique successes and ways to improve their work.		
M CR 5.5.03	Paint Defects	Identify, plan, execute a correction to a flawed painting.		
M CR 5.5.04	Paint Defects	Individually begin and complete a full repainting of a vehicle.		
M CR 5.6.01	Detailing	Buff and polish the finish to remove defects as required.		
M CR 5.6.02	Detailing	Remove overspray.		
M CR 6	ESTIMATING			
M CR 6.1.01	Damage Reports	Research the features of computer-generated estimates.		
M CR 6.1.02	Damage Reports	Know and apply the symbols found on computer-generated reports and what the symbols indicate.		
M CR 6.1.03	Damage Reports	Identify the various reasons for overrides on computer-generated report.		
M CR 6.2.01	Repair Estimating	Identify various alignment operations that appear on a damage report and define each.		
M CR 6.3.01	Finishing Types	Measure mil thickness and correctly identify proper film thickness and excessive film thickness.		
M CR 6.3.02	Finishing Types	Define the different types of corrosion.		
M CR 6.4.01	Information	Locate and decode vehicle identification information.		
M CR 6.5.01	Reports	Properly list all information on an estimate.		

Identifier	Poplar - Master - Collision Repair Technology		Introduced	Completed
M CR 6.5.02	Reports	Understand sublet.		
M CR 6.5.03	Reports	Memorize local sales tax percentages.		
M CR 7	EMPLOYABILITY SKILLS			
M CR 7.1.01	Problem Solving	Evaluate the benefits of solving a work-related problem.		
M CR 7.1.02	Problem Solving	Identify problems that can be minimized/solved by preventative maintenance procedures.		
M CR 7.1.03	Problem Solving	Develop a flowchart using appropriate symbols and terminology to solve problems		
M CR 7.1.04	Problem Solving	Interpret computer-generated data to troubleshoot a problem.		
M CR 7.2.01	Critical Thinking	Analyze how critical-thinking skills affect work performance.		
M CR 7.2.02	Critical Thinking	Formulate, implement, and evaluate an action plan.		
M CR 7.2.03	Critical Thinking	Demonstrate the skills necessary to identify, analyze, and solve a design problem.		
M CR 7.3.01	Speak, Write, Listen	Demonstrate exemplary customer service skills.		
M CR 7.3.02	Speak, Write, Listen	Interpret and respond to verbal and nonverbal messages.		
M CR 7.3.03	Speak, Write, Listen	Compete in a SkillsUSA job skill demonstration and/or public speaking contest.		
M CR 7.4.01	Technology	Critique the use, benefits and cost of technologically advanced tools and equipment.		
M CR 7.4.02	Technology	Analyze the impact of technological changes on one or more aspects of collision repair by researching current literature.		
M CR 7.4.03	Technology	Compete in a SkillsUSA collision repair technology contest.		
M CR 7.5.01	Leadership and Teamwork	Demonstrate leadership ability within a group or a team.		
M CR 7.5.02	Leadership and Teamwork	Acknowledge and utilize the skills, abilities, and input of all members of the team.		
M CR 7.5.03	Leadership and Teamwork	Demonstrate leadership by listening to others and asking appropriate questions to clarify a problem or issue.		
M CR 7.5.04	Leadership and Teamwork	Compromise and/or build consensus within a group and summarize the decision of the group while maintaining respect for diverse viewpoints.		
M CR 7.5.05	Leadership and Teamwork	Compete in a SkillsUSA Professional Development Program.		
M CR 7.5.06	Leadership and Teamwork	Campaign for a local SkillsUSA chapter office.		
M CR 7.5.07	Leadership and Teamwork	Serve on a committee for a local SkillsUSA chapter.		
M CR 7.6.01	Ethics	Demonstrate time-management skills and cost-effective practices.		
M CR 7.6.02	Ethics	Assume responsibility for decisions and actions.		
M CR 7.6.03	Ethics	Demonstrate time-management and cost-effectiveness practices.		
M CR 7.7.01	Workplace	Recognize the individual roles of team members.		
M CR 7.7.02	Workplace	Acknowledge and utilize the skills, abilities, and input of all members of a team.		
M CR 7.7.03	Workplace	Develop an action plan to accomplish tasks within a given time frame.		
M CR 7.8.01	Career	Develop a community service or job shadowing project.		
M CR 7.8.02	Career	Develop an education/training plan to fulfill long-term career goals.		
M CR 7.8.03	Career	Define advantages and disadvantages of self employment or working for various sizes and types of businesses.		
M CR 7.8.04	Career	Critique results of a job interview.		
M CR 7.8.05	Career	Develop a proposal for an organized community service project.		
M CR 7.8.06	Career	Compete in a state-level SkillsUSA job interview contest.		
M CR 7.9.01	Retention	Maintain an electronic portfolio.		
M CR 7.9.02	Retention	Create a plan for lifelong learning.		
M CR 7.9.03	Retention	Create a presentation illustrating interpersonal skills needed for job retention.		
M CR 7.9.04	Retention	Adapt new knowledge and skills in changing situations.		
M CR 7.9.05	Retention	Analyze how work life is affected by families and how families are affected by work life.		