

Appendix K

TRANSPORTATION, DISTRIBUTION AND LOGISTICS YOUTH APPRENTICESHIP

AUTO COLLISION PATHWAY COLLISION REPAIR BASICS (UNIT 3)

Unit 3: Auto Collision Pathway

Collision Repair Basics

Competency

1. Obtain and apply basic vehicle and collision repair knowledge

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- in the classroom

Performance Standard Criteria

Performance will be successful when learners:

- Demonstrate vehicle systems knowledge based on current understanding
- Comply with personal safety practices concerning clothing, hand and power tool usage, proper ventilation of fumes and lifting and securing of vehicles
- Comply with environmental safety standards concerning handling, storage and disposal of hazardous materials and chemicals in accordance with local, state and federal regulations
- Comply with safety and hazards requirements associated with volatile organic compounds (VOC)
- Apply knowledge of Low VOC regulations and refinish technology
- Identify approved service procedure prior to completing any work on a vehicle
- Perform all procedures according to manufacturer and regulatory requirements

Learning Objectives

- Explain body design and frame variations
- Compare unibody and body-over-frame construction
- Identify major structural parts, sections, and assemblies of body-over-frame vehicles
- Identify major structural parts, sections, and assemblies of unibody vehicles
- Summarize how to classify vehicles by body, engine, and drive train configurations
- Identify commonly used automotive fasteners
- Explain common broken fastener removal techniques
- Define VOC
- List the hazards associated with VOCs
- Describe steps for reducing exposure to VOCs
- Locate VOC content on paint & solvent products
- Identify shop materials regulated by the EPA
- Describe the sources for obtaining VOC content
- Identify hazardous operations and materials according to federal, state, and local regulations
- Discuss/evaluate auto collision industry trends

Comments:

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Competency

2. Obtain required tools, equipment and materials before work

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- in the classroom

Performance Standard Criteria

Performance will be successful when learners:

- Determine procedure to be completed
- Note required tools, equipment, and materials needed
- Choose correct tool or equipment for the task
- Verify tool/equipment is current for preventative maintenance and/or calibration

Learning Objectives

- Explain the types of equipment used in a collision repair shop
- Outline applications of each tool and equipment
- List which tools and equipment require safety certification
- Explain the purpose of preventative maintenance
- Compare & contrast power tools, pneumatic tools and hand tools and their uses
- Explain low emissions spray equipment and regulations
- Explain the operation of spray booths and drying rooms
- Identify various types of spray guns and how each operates

Comments:

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Competency

3. Maintain work area

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- in the classroom

Performance Standard Criteria

Performance will be successful when learners:

- Maintain and retrieve shop manuals and/or electronic retrieval systems
- Organize tools
- Sweep work area
- Put shop equipment away
- Clean work bench
- Dispose of garbage and recyclables properly
- After servicing, clean work area
- After servicing, return tools to proper location
- After servicing, complete and store appropriate documentation

Learning Objectives

- Describe the typical movement of a vehicle through the collision repair facility
- Summarize the major areas of repair in a body shop
- Describe typical shop layouts

Comments:

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Collision Repair Basics

Competency

4. Operate tools and equipment safely

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- in the classroom

Performance Standard Criteria

Performance will be successful when learners:

- Operates only equipment that he/she is trained on
- Verifies tool/equipment is available for use and in working order
- Verifies safety equipment and any Personal Protective Equipment (PPE) needed for tool/equipment use
- Operates tool/equipment safely with guarding devices if applicable in the manner required for the job task
- Monitors tool/equipment for safe operation while operating
- Properly shuts down and labels any tool/equipment that is not operating as expected, if applicable
- Follows Lock Out/Tag Out procedures as applicable
- Documents use and maintenance as required

Learning Objectives

- Describe and demonstrate the safety requirements for each tool and equipment
- Discuss start up and shut down procedures for each tool/equipment you will operate
- Describe emergency shutdown procedures for the tool/equipment you will operate
- Explain how to recognize and address malfunctions for the tool/equipment you will operate
- Describe how to recognize wear and tear on equipment components
- List the OSHA and other regulatory requirements as they apply to the equipment that you operate
- Describe proper techniques for lifting loads
- List the safeguards that apply to the equipment used in your facility for tools, automated machines, material handling equipment, and lifts
- Explain Lock Out/Tag Out indications and procedures in your facility

Comments:

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Competency

5. Clean and store tools after use

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- in the classroom

Performance Standard Criteria

Performance will be successful when learners:

- Follows procedures for clean up and shut down after use
- Performs any required preventative maintenance procedures
- Investigates and promptly reports abnormal tool/equipment conditions
- Store tools in proper manner in proper locations

Learning Objectives

- Explain the importance of proper cleaning and storage of tools after use
- List the common cleaning procedures for typical tools in an auto collision repair shop
- Describe any special handling requirements for tools

Comments:

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Collision Repair Basics

Competency

6. Dispose of parts, garbage, and recyclables properly

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- in the classroom

Performance Standard Criteria

Performance will be successful when learners:

- Dispose of materials and wastes as required
- Dispose of damaged parts as required
- Segregate and recycle materials as required

Learning Objectives

- List common auto body repair shop wastes
- List common items considered recyclable
- List common items that are regulated for disposal
- Describe the disposal procedures for old parts, hazardous materials and substances
- Define Toxic Characteristic Leaching Procedure (TCLP)
- Explain the rationale for special disposal requirements
- Describe container requirements for flammables & combustibles
- Describe container requirements for hazardous wastes
- Explain the procedures for handling & disposing lead-acid batteries
- Describe handling and disposal requirements for paint solids and waterborne materials

Comments:

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Collision Repair Basics

Competency

7. Locate & record vehicle information

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when learners:

- Obtain customer information and vehicle identifying information such as VIN, year, make model, engine, optional equipment, mileage
- Identify & note all pre-collision damage
- Check technical service bulletins/updates and identify approved procedures prior to completing any collision work
- Retrieve shop manuals and/or electronic information systems
- Research applicable vehicle and service information, normal body system specifications, vehicle service history, service precautions, and applicable technical service bulletins

Learning Objectives

- Define basic auto collision and repair terminology
- Define the purpose & use of the vehicle identification number (VIN), engine numbers, and date codes
- Describe how to locate and determine vehicle information such as the vehicle identification number (VIN) information, nation of origin, make, model, restraint system, body type, production date, engine type, and assembly plant
- Identify references that are used to estimate vehicle repair charges
- Describe the different types of service manuals
- Find and use the service manual index and contents sections
- Explain the different kinds of information and illustrations used in a service manual
- Describe the three basic types of troubleshooting charts found in service manuals
- Explain how to use computer-based service information
- Demonstrate the use of NAGS (auto glass) domestic and foreign catalogs

Comments:

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Collision Repair Basics

Competency

8. Maintain service & repair records

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when learners:

- Select appropriate forms/records
- Code documents as required
- File forms/records in appropriate location
- Retrieve and replace files in correct position
- Add, Edit, Verify and Query data in electronic files if applicable
- Verify data prior to entry/storage
- Maintain files

Learning Objectives

- Describe the importance of repair documentation for collision repair facilities
- Demonstrate how electronic data is manipulated such as in a spreadsheet system
- Explain how data & files are backed up
- Identify and explain the role and function of software management systems

Comments:

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Collision Repair Basics

Competency

9. Remove old decals, stripes, emblems & moldings

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when learners:

- Obtain equipment & materials needed
- Review safety & service procedures
- Check automobile manufacturer's recommended procedures
- Mask around removal area to protect finish from damage
- Remove old decals, stripes, moldings or emblems held in place by fasteners or adhesives using appropriate tools & solutions
- After servicing, cleanup work area, return tools to proper location, complete appropriate documentation.

Learning Objectives

- Describe safety practices related to personal protection, equipment & materials for this process
- Describe how to remove tape pinstripes, painted pinstripes, and decals
- Explain how to use chemical strippers, heat guns and mechanical removal tools
- Describe when you would use specific removal tools to remove specific items
- List common exterior trim that should be removed prior to body work or painting
- Explain removal procedures for exterior parts, trim, and moldings

Comments:

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Collision Repair Basics

Competency

10. Apply decals, tapes, stripes, emblems & moldings

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when learners:

- Obtain equipment & materials needed
- Review safety & service procedures
- Check automobile manufacturer's recommended procedure
- Clean the painted surface
- Position the attachment
- Apply decals, stripes, moldings or emblems using appropriate fasteners or adhesives
- After servicing, cleanup work area, return tools to proper location, complete appropriate documentation.

Learning Objectives

- Summarize uses of chemical fasteners
- Describe safety practices related to personal protection, equipment & materials for this process
- Describe how to install tape pinstripes, painted pinstripes, and decals
- Describe methods for properly positioning attachments
- Compare adhesives used in application processes and when to use them
- List the strength and cure times of adhesives
- Explain the importance of using one product line throughout the repair
- List the specifications for urethane adhesives
- Compare wet versus dry overlay methods

Comments:

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Collision Repair Basics

Competency

11. Remove exterior dirt, grease, wax and coatings from surfaces

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when learners:

- Obtain equipment & materials needed
- Review safety & service procedures
- Wash the vehicle with soap & water
- Clean the area to be prepped with wax and grease remover
- Assist a worksite professional to correct any surface defects mask the vehicle
- Tack off the vehicle using a tack rag
- Clean surfaces and remove corrosion protection using appropriate tools and solutions
- After servicing, cleanup work area, return tools to proper location, complete appropriate documentation

Learning Objectives

- Describe safety practices related to personal protection, equipment & materials for this process
- Describe the process of vehicle cleaning
- Explain the importance of pH in cleaning surfaces
- Explain how to use wax & grease remover
- Describe the cleaning techniques & solutions needed for removing grease, wax, & corrosion protection
- Describe the cleaning techniques for cleaning the engine compartment, vehicle exterior, vinyl tops, and wheels and tires
- Demonstrate mechanical and chemical methods of surface cleaning available in collision repair
- Demonstrate use of surface preparation chemicals
- Identify types and locations of seam sealers, undercoating, and sound deadening
- Describe the proper methods to protect electrical parts and connectors prior to cleaning
- Demonstrate proper tacking off of a surface

Comments:

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Collision Repair Basics

Competency

12. Clean interior, exterior, body openings and glass

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when learners:

- Obtain equipment & materials needed
- Review safety & service procedures
- Cover & protect electrical parts & connectors
- Clean carpet, glass, upholstery, vents, instrument panel & trunk
- After servicing, cleanup work area, return tools to proper location, complete appropriate documentation

Learning Objectives

- Describe safety practices related to personal protection, equipment & materials for this process
- Explain the importance of pH in cleaning surfaces
- Describe the cleaning techniques for cleaning carpet stains, vehicle glass, upholstery, vents, instrument controls, conditioned interior parts, the trunk, removing odors
- Describe the proper methods to protect electrical parts and connectors prior to cleaning
- Explain the materials to clean a vehicle following air bag deployment
- Compare finesse finishing and detailing

Comments:

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Collision Repair Basics

Competency

13. Mask exterior/interior panels & parts adjacent to repair areas

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when learners:

- Obtain equipment & materials needed
- Review safety & service procedures
- Clean surface dirt, grease, wax, and corrosion protection
- Dry surface
- Place masking paper over large areas; cut paper to fit
- Hold and peel masking tape with one hand
- Use other hand to guide and secure tape to vehicle
- After servicing, cleanup work area, return tools to proper location, complete appropriate documentation

Learning Objectives

- Describe safety practices related to personal protection, equipment & materials for this process
- Define the purpose of masking
- Define overspray
- List materials used in masking
- Explain when to use foam or liquid masking materials
- Identify types of masking and specialty tapes
- Explain factors to consider to mask or remove a part
- Demonstrate proper tape, reverse, and fine-line masking techniques
- Describe proper removal of masking

Comments:

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Collision Repair Basics

Competency

14. Remove over-spray

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when learners:

- Obtain equipment & materials needed
- Review safety & service procedures
- Use a wet abrasive to lightly sand the overspray until the overspray is removed
- Buff & polish as needed
- After servicing, cleanup work area, return tools to proper location, complete appropriate documentation

Learning Objectives

- Describe safety practices related to personal protection, equipment & materials for this process
- Discuss methods to remove over-spray
- Describe the cleaning techniques & solutions needed for removing overspray
- Explain why light sand is required to remove overspray
- Discuss the precautions to take when removing overspray

Comments:

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Collision Repair Basics

Competency

15. Apply anti-corrosion primers

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when learners:

- Obtain equipment & materials needed
- Review safety & service procedures
- Clean, dry & degrease surface depending on type of surface
- Stir primer well
- Apply primer with brush roller or spray evenly
- Spread evenly
- After servicing, cleanup work area, return tools to proper location, complete appropriate documentation

Learning Objectives

- Describe safety practices related to personal protection, equipment & materials for this process
- Define corrosion
- Explain causes of corrosion
- List the environmental conditions that affect the rate of corrosion
- Define the relationship between corrosion and structural integrity
- Describe the corrosion protection areas
- Explain how to protect vehicle bodies from corrosion
- Describe the function of vehicle coatings
- List common corrosive hot spots
- Identify vehicle body areas which involve exposed interior surfaces
- List products used in collision repair to restore corrosion protection
- Compare primers characteristics
- Demonstrate use of primers to restore corrosion protection

Comments:

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Collision Repair Basics

Competency

16. Apply corrosion protection to surfaces

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when learners:

- Obtain equipment & materials needed
- Review safety & service procedures
- Prepare corrosion protection substances
- Apply topcoat and sealer to primed areas
- Apply corrosion protection system to enclosed interior surfaces
- Apply corrosion protection system to exposed exterior surface
- Apply corrosion protection system to interior surfaces
- After servicing, cleanup work area, return tools to proper location, complete appropriate documentation

Learning Objectives

- Describe safety practices related to personal protection, equipment & materials for this process
- List the types of metal coatings used to protect sheet metal
- Compare anti-corrosion compounds
- Describe different types of corrosion protection applications
- Identify procedures to restore corrosion protection to surfaces
- Compare corrosion protection for bolted- on versus welded-on interior areas
- Discuss corrosion protection principles for vehicle underbody
- Explain how to use metal conditioner and conversion coating
- Describe different types of seam sealers
- Define galvanic corrosion
- Explain how to prevent galvanic corrosion
- List the vehicle parts to avoid with corrosion protection
- Describe self-etching undercoats and how it affects panel preparation

Comments:

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Collision Repair Basics

Competency

17. Apply corrosion protection to joints, seams & weld areas

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance

Performance will be successful when learners:

- Obtain equipment & materials needed
- Review safety & service procedures
- Thoroughly clean the joint or seam
- Apply primer and seam sealers
- Apply final primer coat(s)
- Apply topcoat
- After servicing, cleanup work area, return tools to proper location, complete appropriate documentation

Learning Objectives

- Describe safety practices related to personal protection, equipment & materials for this process
- Discuss characteristics of seam sealers
- Explain the characteristics and uses of chip-resistant coatings
- List treatments required in weld areas
- Plan and complete corrosion protection in weld areas
- Identify external seams which require protection by seam sealer
- Compare types of seam sealer
- Demonstrate techniques used to apply seam sealer

Comments:

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Collision Repair Basics

Competency

18. Sand and buff polish with appropriate compounds

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when learners:

- Obtain equipment & materials needed
- Review safety & service procedures
- Inspect the finished surface for any imperfections per paint, product and automobile manufacturers' specifications
- Determine if any contamination or painting errors exist
- Determine cause of condition
- Assist worksite professional to correct imperfections (e.g., runs, dirt nibs, fish eyes, die backs, texture, shrink, swelling, etc.)
- Apply appropriate polish to vehicle and pad
- Buff polish evenly using polisher correctly
- Clean area
- Perform final wash, removing all residue (e.g., compound, overspray, etc.) from repair process
- After servicing, cleanup work area, return tools to proper location, complete appropriate documentation

Learning Objectives

- Describe safety practices related to personal protection, equipment & materials for this process
- Identify and distinguish between finish systems
- Compare finish systems and system parts
- Identify possible contaminants on a painted surface and how to correct
- Describe tools and materials used to correct common imperfections
- Explain the use of a paint thickness gauge
- Demonstrate the proper methods and materials to buff and polish finish

Comments: