



AUTOBODY/COLLISION AND REPAIR TECHNOLOGY/TECHNICIAN

[CIP Code 47.0603](#)

This document is a Program of Study for Autobody/Collision and Repair Technology/Technician programs at the secondary level. This program of study is considered a framework, not a curriculum. From this framework educators may use this as a tool to provide structure for developing learning modules, unit plans, or daily lesson plans that meet the tasks or standards within the program of study. This program of study is based on research, experience, and many resources. The goal is to train a workforce that is skilled, knowledgeable, and able to meet the needs of the industry today and well into the future.

Most of the damage resulting from everyday vehicle collisions can be repaired, and vehicles can be refinished to look and drive like new. Automotive body repairers, often called collision repair technicians, straighten bent bodies, remove dents, and replace crumpled parts that cannot be fixed. They repair all types of vehicles, and although some work on large trucks, buses, or tractor-trailers, most work on cars and small trucks. They can work alone, with only general direction from supervisors, or as specialists on a repair team. In some shops, helpers or apprentices assist experienced repairers.

Each damaged vehicle presents different challenges for repairers. Using their broad knowledge of automotive construction and repair techniques, automotive body repairers must decide how to handle each job based on what the vehicle is made of and what needs to be fixed. They must first determine the extent of the damage and order any needed parts.

If the car is heavily damaged, an automotive body repairer might start by realigning the frame of the vehicle. Repairer's chain or clamp frames and sections to alignment machines that use hydraulic pressure to align damaged components. "Unibody" vehicles – designs built without frames – must be restored to precise factory specifications for the vehicle to operate correctly. For these vehicles, repairers use benchmark systems to accurately measure how much each section is out of alignment, and hydraulic machinery to return the vehicle to its original shape. Once the frame is aligned, repairers can begin to fix or replace damaged body parts. If the vehicle or part is made of metal, body repairers will use a pneumatic metal-cutting gun or other tools to remove badly damaged sections of body panels and then weld in replacement sections. Less serious dents are pulled out with a hydraulic jack or hand prying bar or knocked out with handtools or pneumatic hammers. Small dents and creases in the metal are smoothed by holding a small anvil against one side of the damaged area while hammering the opposite side. Repairers also remove very small pits and dimples with pick hammers and punches in a process called metal finishing. Body repairers use plastic or solder to fill small dents that cannot be worked out of plastic or metal panels. On metal panels, they file or grind the hardened filler to the original shape and clean the surface with a media blaster – similar to a sand blaster – before repainting the damaged portion of the vehicle.

Body repairers also repair or replace the plastic body parts that are increasingly used on new vehicles. They remove damaged panels and identify the type and properties of the plastic used. With most types of plastic, repairers can apply heat from a hot-air welding gun or immerse the panel in hot water and press the softened section back into shape by hand. Repairers replace plastic parts that are badly damaged or very difficult to fix. A few body repairers specialize in fixing fiberglass car bodies.

Some body repairers specialize in installing and repairing glass in automobiles and other vehicles. Automotive glass installers and repairers remove broken, cracked, or pitted windshields and window glass. Glass installers apply a moisture-proofing compound along the edges of the glass, place the glass in the vehicle, and install rubber strips around the sides of the windshield or window to make it secure and weatherproof.

Many large shops make repairs using an assembly-line approach where vehicles are fixed by a team of repairers who each specialize in one type of repair. One worker might straighten frames while another repairs doors and fenders, for example. In most shops, automotive painters do the painting and refinishing, but in small shops, workers often do both body repairing and painting.

Repairers work indoors in body shops that are noisy with the clatter of hammers against metal and the whine of power tools. Most shops are well ventilated to disperse dust and paint fumes. Body repairers often work in awkward or cramped positions, and much of their work is strenuous and dirty. Hazards include cuts from sharp metal edges, burns from torches and heated metal, injuries from power tools, and fumes from paint. However, serious accidents usually are avoided when the shop is kept clean and orderly and safety practices are observed.

Most automotive body repairers work a standard 40-hour week. More than 40 hours a week may be required when there is a backlog of repair work to be completed. This may include working on weekends.

Automotive technology is rapidly becoming more sophisticated, and most employers prefer applicants who have completed a formal training program in automotive body repair or refinishing. Most new repairers complete at least part of this training on the job. Many repairers, particularly in urban areas, need a national certification to advance past entry-level work.

A high school diploma or GED is often all that is required to enter this occupation, but more specific education and training is needed to learn how to repair newer automobiles. Collision repair programs may be offered in high school or in postsecondary vocational schools and community colleges. Courses in electronics, physics, chemistry, English, computers, and mathematics provide a good background for a career as an automotive body repairer. Most training programs combine classroom instruction and hands-on practice.

Trade and technical school programs typically award certificates to graduates after 6 months to a year of collision repair study. Some community colleges offer 2-year programs in collision repair. Many of these schools also offer certificates for individual courses, so that students are able to take classes incrementally or as needed.

New repairers begin by assisting experienced body repairers in tasks such as removing damaged parts, sanding body panels, and installing repaired parts. Novices learn to remove small dents and make other minor repairs. They then progress to more difficult tasks, such as straightening body parts and returning them to their correct alignment. Generally, it takes 3 to 4 years of hands-on training to become skilled in all aspects of body repair, some of which may be completed as part of a formal education program. Basic automotive glass installation and repair can be learned in as little as 6 months, but becoming fully qualified can take several years. Continuing education and training are needed throughout a career in automotive body repair. Automotive parts, body materials, and electronics continue to change and to become more

complex. To keep up with these technological advances, repairers must continue to gain new skills by reading technical manuals and furthering their education with classes and seminars. Many companies within the automotive body repair industry send employees to advanced training programs to brush up on skills or to learn new techniques.

Fully skilled automotive body repairers must have good reading ability and basic mathematics and computer skills. Restoring unibody automobiles to their original form requires repairers to follow instructions and diagrams in technical manuals and to make precise three-dimensional measurements of the position of one body section relative to another. In addition, repairers should enjoy working with their hands and be able to pay attention to detail while they work.

Assumptions of This Program of Study

High-quality programs should meet the following standards:

- Promote **positive working relationships**
- Implement a **curriculum** that fosters all areas of skill development – cognitive, emotional, language, physical, and social
- Use developmentally, culturally, and linguistically appropriate and **effective teaching approaches**
- Provide **ongoing assessments** of student progress
- Employ and support qualified **teaching staff**
- Establish and maintain collaborative relationships **with families**
- Establish and maintain relationships and use resources of the **community**
- Provide a safe and healthy learning **environment**
- Implement strong program organization and supervision policies that result in **high-quality teaching and learning**
- Integrate academic skills and aptitudes necessary for gainful employment and promoting a foundation of **lifelong learning**

Academic Rigor

Research shows that career success requires the same level of college-prep courses as postsecondary success requires. The Department of Education's focus is to ensure that every student graduates prepared for college and a career. In order to be successful in this program of study, students should follow the academic sequence as determined by Pennsylvania's high school reform efforts.

Resources Used for This Program of Study

- MAVCC (Multistate Academic Vocational Curriculum Consortium)
<http://www.mavcc.org/>
- NOCTI (National Occupational Competency Testing Institute <http://www.nocti.org/>)
- O*NET <http://online.onetcenter.org/>
- Pennsylvania Approved Certifications for Industry-Recognized Certifications for Career and Technical Education Programs
http://www.portal.state.pa.us/portal/server.pt/community/instructional_resources/7392/industry-recognized_certifications_for_career_and_technical_education_programs/507887

- Pennsylvania Department of Labor & Industry High Priority Occupations
http://www.portal.state.pa.us/portal/server.pt/community/high_priority_occupations/12910
- VTECS (A Consortium of Innovative Career and Workforce Development Resources)
<http://www.vtecs.org/>

CIP Code

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Pennsylvania CIP

An instructional program that prepares individuals to apply technical knowledge and skills to repair damaged automotive vehicles such as automobiles and light trucks. Students learn to examine damaged vehicles and estimate cost of repairs; remove, repair and replace upholstery, accessories, electrical and hydraulic window and seat operating equipment and trim to gain access to vehicle body and fenders; remove and replace glass; repair dented areas; replace excessively damaged fenders, panels and grills; straighten bent frames or unibody structures using hydraulic jacks and pulling devices; and file, grind and sand repaired surfaces using power tools and hand tools. Students refinish repaired surfaces by painting with primer and finish coat.

Integrate Academic Career Education and Work Standards for Student Success

As students participate in career exploration activities and rigorous studies from elementary grades through graduation, they learn to appreciate the relationship between their classroom learning and the skills needed within the workplace. The academic and workplace skills within the Academic Standards for Career Education and Work are expected to be addressed within classrooms and achieved by all students throughout Pennsylvania. No student should leave secondary education without a solid foundation in these Standards.

http://www.portal.state.pa.us/portal/server.pt/community/state_board_of_education/8830/state_academic_standards/529102

CEW Standards Tool Kit for teachers to implement CEW Standards
www.pacareerstandards.com

Pennsylvania Approved Certifications

http://www.portal.state.pa.us/portal/server.pt/community/instructional_resources/7392/industry-recognized_certifications_for_career_and_technical_education_programs/507887

The Programs of Study Documents

- Crosswalk Template for Task Alignment (excel) – Autobody/Collision and Repair Technology/Technician – Instructions: Indicate the number code(s) of your school's program competency or competencies aligned to each program of study competency.

- Crosswalk Template for Task Alignment (pdf) – Autobody/Collision and Repair Technology/Technician – Instructions: Indicate the number code(s) of your school’s program competency or competencies aligned to each program of study competency.
- Scope and Sequence Template (word) – Enter secondary technical Program of Study courses. Postsecondary courses will be determined when the Statewide Articulation Agreement for this Program of Study is complete.
- Scope and Sequence Template (pdf) – Enter secondary technical Program of Study courses. Postsecondary courses will be determined when the Statewide Articulation Agreement for this Program of Study is complete.
- PA Academic Standards/Eligible Content Alignment – Autobody/Collision and Repair Technology/Technician Task List (excel) – Crosswalk of PA Academic Standards/Eligible Content for Reading, Writing, Speaking and Listening (RWSL), Math, and Science aligned to Program of Study Secondary Competency List.
- PA Academic Standards/Eligible Content Alignment – Autobody/Collision and Repair Technology/Technician Task List (pdf) – Crosswalk of PA Academic Standards/Eligible Content for Reading, Writing, Speaking and Listening (RWSL), Math, and Science aligned to Program of Study Secondary Competency List.

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