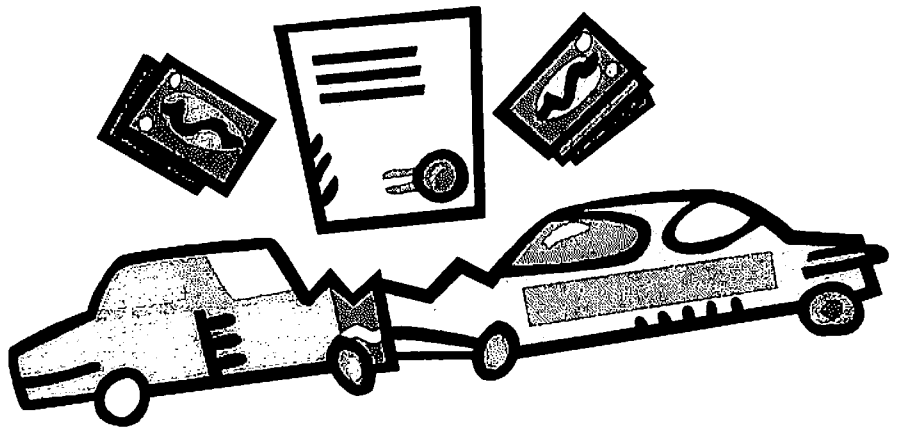
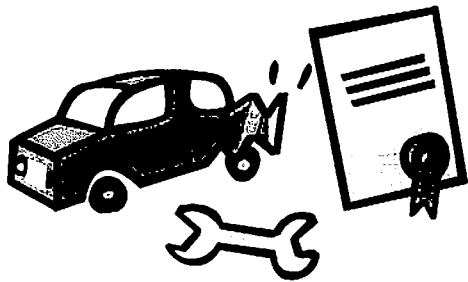


Lewis & Clark Career Center

Curriculum Guide

Auto Collision Repair



Curriculum Guide For Auto Collision Repair

Course Rationale, Course Description, Units of Study

Competencies

Crosswalk to Show Me Standards

Articulation Agreements

Employer Survey / Advisory Board Minutes

Instructional Methods

Integrated Lesson Sample

Work Experience Program

SkillsUSA Officers

Teacher Certification

School and Program Policies and Procedures

Inventory

Program Enrollment Data

Placement Data

Program Evaluation

Program Brochures/Enrollment Packet

Miscellaneous

Course: Auto Collision Repair

Instructor: Mike Kuechler

Rationale

The Auto Collision Repair course is based on the presence of many opportunities for gainful employment in the field of auto collision repair technology to those who complete this course, both secondary and post secondary. The program structure allows an individual to enter the Auto Collision Repair course and experience the educational components needed to become a productive member of this exciting and fast moving career field.

The Auto Collision Repair program is representative of employer needs as expressed by local business and industry professionals. The combination of theory and hands-on experiences is designed to allow the student to integrate the training into successful employment, leading to the fulfillment of personal, cultural and economic goals.

NONE

AUTO COLLISION REPAIR

2 year program; 3 units of credit per year

This course is open to juniors who have an interest in auto collision repair as a wage earning occupation.

In the first year of the program, students will learn how to mig weld, straighten sheet metal, shape fillers, plastic and SMC repair as well as painting procedures.

In the second year, students will learn how to paint with basecoat/clearcoat, align vehicle sheet metal, detailing, install glass, and repair unibodies. Mechanical and electrical services are also covered.

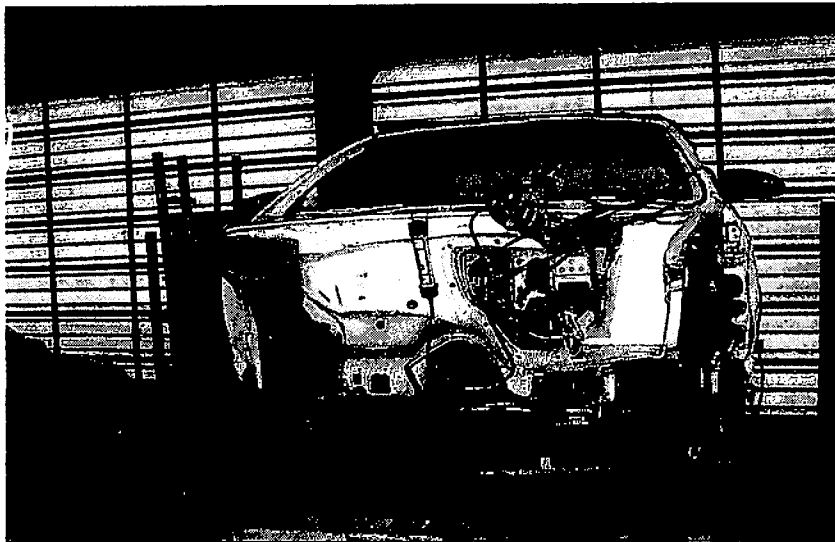
The course is geared to prepare students for entry-level auto collision repair and to take the A.S.E. certification test. I-CAR instruction is used throughout the course.

LEWIS & CLARK CAREER CENTER

AUTO COLLISION REPAIR UNITS OF STUDY

- Safety
- Estimating
- Mig Welding
- Oxyacetylene & Plasma Cutting
- Minor/Major Dent Repair
- Sheet Metal Alignment
- Flexible Parts Repair
- Plastic Repair
- Plastic Welding
- Fiberglass Repair
- Fasteners
- Hand & Power Tool Applications
- Paint Preparation & Paint Mixing
- Urethane Single Stage Painting
- Basecoat/Clearcoat
- Tint & Blend Paint
- Detailing
- Mechanical Services
 - a. Suspensions
 - b. Cooling Systems
 - c. Electrical Systems
 - d. Air Conditioning
 - e. Steering
 - f. Brakes
- Structural Parts Replacement
- Frame & Unibody Straightening
- Body Panel Replacement
- Glass Installation
- Decals & Stripping
- Interior/Exterior Trim
- Active/Passive Restraint Systems
- Employability Skills
- SkillsUSA

Lewis and Clark Career Center 2008-2009



Auto Collision Repair

Course Syllabus

Grade Level(s): 11-12

Course Title: Auto Collision Repair (ACR)

Daily Schedule:

<u>AM Class</u>	First Bell	7:35 a.m.
	Second Bell	7:40 a.m.
Dismissal Bell	<u>Buses</u>	10:20 a.m.
	<u>Drivers</u>	10:25 a.m.
<u>PM Class</u>	First Bell	11:05 a.m.
	Second Bell	11:10 a.m.
Dismissal Bell	<u>Buses</u>	1:45 p.m.
	<u>Drivers</u>	1:55 p.m.

Instructor: Mike Kuechler

Contact Information: Lewis and Clark Career Center
2400 Zumbahl Rd.
St. Charles, MO. 63301
Office: 636-443-4950
ACR : 636-443-4984
Email: mkuechler@mail.stcharles.k12.mo.us

Program: Two years with three credits per year

Introduction:

Through classroom instruction and hands on shop experiences this course will provide the student with technical knowledge and basic skills of auto collision repair technology.

Course Objectives:

The auto collision repair course is designed to prepare the student for an entry level position in a repair shop or advance his or her skills further in a post-secondary career college. Safety and employability skills will be reinforced constantly throughout the entire two year program. All students will have to complete a safety course with a passing grade before being allowed to work in the shop. After successfully completing the program the student will be able to straighten and align sheet metal, MIG weld, apply and shape plastic, urethane and fiberglass/SMC fillers, mix and apply primers, sealers, basecoat/clearcoat finishes, understand damage analysis and fundamentals of repairing unibody vehicles to I-CAR standards. Mechanical, electrical and detailing procedures will also be covered.

Grading:

Employability Skills:	25%
Tests	15%
Quizzes	10%
Shop participation	50%

Assessment:

Competencies/evaluations will be measured from the following areas of instruction and will be collected from classroom test given at the end of each course of study and shop performance.

First Quarter/Semester One:

1. Safety - working with hazardous materials and power tool safety
2. Careers - identifying areas of employment related to auto collision
3. Tools- understanding both hand and power tools used in the collision industry
4. Welding- learn to set-up and weld using a MIG welder cutting steel using an oxyacetylene and plasma arc

Second Quarter/Semester One:

1. Fasteners – Knowledge of different types of interior and exterior fasteners used on today's automobiles
2. Measuring and mixing – read metric and fractional rulers, solve problems involving volume and ratios
3. Sheet metal repair – Straightening metal and using plastic filler

Third Quarter/Semester Two:

1. Refinishing - Surface preparation and spraying techniques, typical paint problems
2. Frame/unibody construction – Analyze non-structural and structural damage, understand how to use equipment used in the repair process
3. Write a damage report – using a crash manual write a damage Estimate

Forth Quarter/Semester Two:

1. Plastic repair - identify types of plastics and methods of repair
2. Structural repair – proper set-up and pulling techniques for frame and unibody vehicles
3. Panel replacement – how to remove & replace welded both structural and non-structural panels

Second Year

First Quarter/Semester One:

1. Steering and suspension – system designs and components
2. Steering and suspension - replacing components and suspension geometry/wheel alignment
3. Brake systems – ABS systems

Second Quarter/Semester One:

1. Detailing – tools and equipment used, detailing before and after Collision repair
2. Glass – removing both stationary and movable glass

Third Quarter/Semester Two:

1. Electrical – basic body and mechanical component knowledge needed by the collision technician
2. Lightening – understand and repair basic systems

Fourth Quarter/Semester Two:

1. Engine systems – basic mechanical systems knowledge needed by the collision technician
2. Heating and A/C – understanding automotive HVAC system basics, evacuating and recharging

Instructional Materials and Resources

Auto Collision Technology Modules 1 thru 9 by the Instructional Material Laboratory (IML)

I-CAR CD based instructional materials

VHS and DVD programs related to the collision repair field

Auto Body Repair Technology, Fifth Edition by James E. Duffy

Classroom Rules

Come to class on time and be prepared to participate
Enter the classroom in an orderly fashion and be seated
Stay in the classroom until you are dismissed
Be respectful to others
Have the required safety equipment
Practice safety rules at all times
No horseplay in the shop or classroom
No sleeping in class
Raise hand and be recognized before speaking during class

Required Supplies

Safety Glasses (first pair is given to each student and replacements cost \$3)
Paint respirator (preferably 3M brand) Disposable paint suit (these can be purchased at school
Dark Blue "Dickies" work uniform shirt and pants (provides a professional look and keeps expensive school clothes from being damaged while working in the shop.)
Three ring binder
#2 lead pencils
Leather work gloves

These may be included or additional to the rules outlined in the Lewis and Clark Student Handbook. Deduction of employability points will result in not following the classroom or shop rules. Student will be responsible for replacing any damaged text book assigned to them and will be expected to take care of them. Current cost is \$140 per book.

Our goal at Lewis and Clark is the success of the student. My personal goal is to make sure that your son or daughter receives the information

and experience necessary to accomplish their goals after completion of the Auto Collision Repair course. Thank you for reviewing the information contained in the Lewis and Clark Student Handbook, the St. Charles School District Code of Conduct and this syllabus. If you have any questions or concerns regarding your son or daughter please feel free to contact me anytime by phone or email.

I would like to make sure this information was made available to the student's parent or guardian. I would appreciate if you and the student sign and return to me the last page to put in their file.
Thank You.

Lewis and Clark Career Center

Auto Collision Technology

We have received a copy of the Lewis and Clark Career Center Student Handbook and the St. Charles School District High School Code of Conduct for the 2008 -2009 school year.

Students Signature _____

Parent or Guardians Signature _____



LEWIS & CLARK

CAREER CENTER

AUTOMOTIVE COLLISION TECHNOLOGY COMPETENCIES

STUDENT:
Rating Scale:

- 6 Mastered
- 5 Repetitive Demonstration
- 4 Performance Demonstrated
- 3 Knowledge Demonstrated
- 2 Partial Demonstration
- 1 Unsuccessful Attempt
- 0 No Exposure

6	5	4	3	2	1	0	A. The Auto Collision Career
							1. Identify opportunities in the auto collision field
							2. Identify the basic construction of the auto body

6	5	4	3	2	1	0	B. Measuring and Mixing
							1. Read a rule, fractional-inch and metric
							2. Solve problems involving volume and ratios

6	5	4	3	2	1	0	C. Tools and Equipment
							1. Demonstrate safe use and maintenance of general hand tools
							2. Demonstrate safe use and maintenance of auto collision hand tools
							3. Demonstrate safe use and maintenance of electric and pneumatic hand tools
							4. Demonstrate safe use and maintenance of electric, pneumatic, and hydraulic equipment
							5. Describe proper lifting and jacking techniques

6	5	4	3	2	1	0	D. Safety
							1. Identify government agencies regulating the auto collision industry
							2. Identify general safety rules
							3. Use protective clothing and equipment
							4. Identify the proper use of fire protection equipment
							5. Use chemicals safely
							6. Identify environmental effects of chemicals
							7. Identify proper chemical disposal techniques
							8. Identify information on MSD sheets
							9. Identify toxic substances

6	5	4	3	2	1	0	E. Write a Damage Report
							1. Diagnose and analyze damage
							2. Use collision manuals
							3. Write a damage report in logical sequence

6	5	4	3	2	1	0	F. Auto Collision Welding
							1. Identify auto collision welding processes
							2. Use safety procedures in welding processes
							3. Set up equipment for MIG welding
							4. Prepare metal for MIG welding
							5. Construct MIG welds

									6. Perform destructive tests
									7. Weld high strength steel
									8. Weld aluminum
									9. Identify cutting processes
									10. Set up and use equipment for cutting

6	5	4	3	2	1	0		G Sheet Metal Repairs
								1. Analyze damage and develop repair plan
								2. Clean the exterior surface
								3. Roughout panel
								4. Use weld-on nail gun to repair sheet metal
								5. Shrink panel
								6. Prepare surface and apply body filler
								7. Finish body filler

6	5	4	3	2	1	0		H Body Panel Replacement
								1. Remove and replace non-structural panels, welded on
								2. Remove and replace structural panels, welded on
								3. Remove and replace non-structural panels, welded on
								4. Section non structural panels on
								5. Replace weld-on door panels and door intrusion barrier
								6. Replace bonded door panels
								7. Remove and replace bumpers, steel and aluminum
								8. Replace energy absorbers
								9. Remove and replace soft fascia covers
								10. Apply corrosion protection

6	5	4	3	2	1	0		I Plastic Panel Repair
								1. Identify plastic types
								2. Clean and prepare exterior surfaces
								3. Analyze damage and repair techniques
								4. Perform airless plastic repair
								5. Perform repairs with chemical adhesives
								6. Repair holes in SMC body panels
								7. Section SMC and fiberglass body panels
								8. Remove and replace complete SMC body panel
								9. Repair and retexture plastic parts
								10. Prepare repaired area for refinishing
								11. Reconstruct fiberglass panels and identify safety procedures

6	5	4	3	2	1	0		J Refinishing Equipment and Procedures
								1. Demonstrate safe painting practices and use of protective clothing and equipment
								2. Identify and demonstrate use of refinishing equipment
								3. Using a paint gun with proper technique
								4. Identify surface preparation techniques
								5. Demonstrate appropriate masking techniques Identify undercoats and demonstrate application procedures
								6. Demonstrate appropriate masking techniques
								7. Identify undercoats and demonstrate application procedures
								8. Apply chip-resistant coating
								9. Identify topcoats and demonstrate application procedures
								10. Tint and blend color coat
								11. Mix and apply single-stage topcoat
								12. Mix and apply basecoat/clearcoat
6	5	4	3	2	1	0		J Refinishing Equipment and Procedures
								13. Mix and apply multi-stage systems

6	5	4	3	2	1	0	Q Heating and Air Conditioning
							1. Identify air conditioning system components and service procedures
							2. Replace condenser
							3. Remove and reinstall compressor
							4. Test the system for leaks
							5. Repair leaks in air condition systems
							6. Check and service air conditioning hoses
							7. Evacuate and charge system using vacuum pump or charging system
							8. Inspect, flush, and replace heater components

6	5	4	3	2	1	0	R Frame-body and Unibody Construction and Repair
							1. Identify vehicle frame construction and terminology
							2. Identify types of damage
							3. Use and interpret specifications manuals
							4. Identify characteristics and uses of high strength steel
							5. Analyze damage using tram and self-centering gauges
							6. Analyze damage using universal measuring system
							7. Analyze damage using dedicated measuring system

6	5	4	3	2	1	0	S Vehicle Structural Repair
							1. Straighten and align structural damage
							2. Replace component parts
							3. Perform stress relief using shock
							4. Perform stress relief using heat
							5. Replace high strength steel
							6. Section component parts
							7. Remove and reinstall mechanical components

6	5	4	3	2	1	0	T Steering and Suspension
							1. Identify suspension systems
							2. Perform suspension quick checks
							3. Remove and reinstall suspension systems
							4. Service suspension systems
							5. Identify steering systems
							6. Inspect, repair, and replace steering components
							7. Service power steering system
							8. Service brake systems
							9. Inspect diagnose and repair causes of tire wear patterns

6	5	4	3	2	1	0	T Steering and Suspension
							10. Perform four-wheel alignment
							11. Remove and install front drive trains

6	5	4	3	2	1	0	U. Detailing
							1. Apply decals and misc, exterior trim
							2. Demonstrate polishing techniques
							3. Clean exterior and glass surfaces
							4. Perform interior detailing
							5. Clean body opening
							6. Remove overspray

6	5	4	3	2	1	0	V. Leadership Competencies
							1. Demonstrate an understanding of VICA, its structure and activities
							2. Demonstrate an understanding of one's personal values
							3. Perform tasks related to effective personal management skills

LEWIS AND CLARK CAREER CENTER



AUTOMOTIVE COLLISION TECHNOLOGY COMPETENCIES

STUDENT:

ID NO:

Rating Scale:

- | | |
|---|---------------------------------|
| 6 | Mastered |
| 5 | Repetitive Demonstration |
| 4 | Performance Demonstrated |
| 3 | Knowledge Demonstrated |
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6	5	4	3	2	1	0	
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							C. Tools and Equipment
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							4. Demonstrate safe use and maintenance of electric, pneumatic, and hydraulic equipment
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6	5	4	3	2	1	0	
							D. Safety
							1. Identify government agencies regulating the auto collision industry
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							3. Use protective clothing and equipment
							4. Identify the proper use of fire protection equipment
							5. Use chemicals safely
							6. Identify environmental effects of chemicals
							7. Identify proper chemical disposal techniques
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6	5	4	3	2	1	0	
							E. Write a Damage Report
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							2. Use safety procedures in welding processes
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							4. Prepare metal for MIG welding
							5. Construct MIG welds
							6. Perform destructive tests
							7. Weld high strength steel
							8. Weld aluminum
							9. Identify cutting processes
							10. Set up and use equipment for cutting

**Lewis and Clark Career Center
Program Competencies**



6	5	4	3	2	1	0	G Sheet Metal Repairs
							1. Analyze damage and develop repair plan
							2. Clean the exterior surface
							3. Roughout panel
							4. Use weld-on nail gun to repair sheet metal
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							6. Prepare surface and apply body filler
							7. Finish body filler

6	5	4	3	2	1	0	H Body Panel Replacement
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							3. Remove and replace non-structural panels, welded on
							4. Section non structural panels on
							5. Replace weld-on door panels and door intrusion barrier
							6. Replace bonded door panels
							7. Remove and replace bumpers, steel and aluminum
							8. Replace energy absorbers
							9. Remove and replace soft fascia covers
							10. Apply corrosion protection

5	4	3	2	1	0	I Plastic Panel Repair
						1. Identify plastic types
						2. Clean and prepare exterior surfaces
						3. Analyze damage and repair techniques
						4. Perform airless plastic repair
						5. Perform repairs with chemical adhesives
						6. Repair holes in SMC body panels
						7. Section SMC and fiberglass body panels
						8. Remove and replace complete SMC body panel
						9. Repair and retexture plastic parts
						10. Prepare repaired area for refinishing
						11. Reconstruct fiberglass panels and identify safety procedures

6	5	4	3	2	1	0	J Refinishing Equipment and Procedures
							1. Demonstrate safe painting practices and use of protective clothing and equipment
							2. Identify and demonstrate use of refinishing equipment
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							7. Identify undercoats and demonstrate application procedures
							8. Apply chip-resistant coating
							9. Identify topcoats and demonstrate application procedures
							10. Tint and blend color coat
							11. Mix and apply single-stage topcoat
							12. Mix and apply basecoat/clearcoat

**Lewis and Clark Career Center
Program Competencies**



6	5	4	3	2	1	0	J Refinishing Equipment and Procedures
							13. Mix and apply multi-stage systems
							14. Identify and refinish flexible plastic parts
							15. Perform clearcoat repair and detailing
							16. Identify paint defects and refinishing procedures

6	5	4	3	2	1	0	K Fasteners
							1. Identify types of bolts and nuts, US and metric
							2. Identify types of screws
							3. Identify types of rivets
							4. Identify types of clips

6	5	4	3	2	1	0	L Exterior and Interior Molding and Trim
							1. Remove and replace belt molding and trim
							2. Remove and replace adhesive-held molding and trim
							3. Locate and drill holes for molding and trim
							4. Remove and replace decals and stripes
							5. Identify interior components and trim
							6. Remove and replace seats
							7. Remove and reinstall seat belt components
							8. Remove and reinstall carpeting
							9. Remove and reinstall dash assembly
							10. Identify, inspect, and disarm supplemental restraints systems
							11. Diagnose supplemental restraint systems
							12. Replace supplemental restraint systems

6	5	4	3	2	1	0	M Glass
							1. Identify vehicle glass and replacement procedures
							2. Remove and replace a reveal molding
							3. Remove and replace a gasket-type window or backglass
							4. Remove and replace glass with urethane sealants
							5. Remove and replace a door trim panel
							6. Remove and replace a lock cylinder
							7. Remove and replace a door glass
							8. Remove and replace a window regulator

6	5	4	3	2	1	0	N. Electrical Systems
							1. Identify electrical systems components
							2. Service a battery
							3. Use a DVOM
							4. Diagnose and repair electrical accessories
							5. Inspect, adjust, and replace charging systems

6	5	4	3	2	1	0	O Lighting Systems
							1. Service a taillight assembly
							2. Service a headlight assembly
							3. Service a retractable headlight assembly
							4. Aim headlights using mechanical aiming equipment

**Lewis and Clark Career Center
Program Competencies**



6	5	4	3	2	1	0	P Engine Systems
							1. Remove and replace a radiator
							2. Remove, inspect, and replace belts
							3. Test antifreeze solution
							4. Service fan blades and clutches
							5. Check and service radiator and heater hoses
							6. Inspect, repair, and replace auxiliary oil cooler
							7. Inspect, repair, and replace fuel, exhaust, and emissions systems

6	5	4	3	2	1	0	Q Heating and Air Conditioning
							1. Identify air conditioning system components and service procedures
							2. Replace condenser
							3. Remove and reinstall compressor
							4. Test the system for leaks
							5. Repair leaks in air condition systems
							6. Check and service air conditioning hoses
							7. Evacuate and charge system using vacuum pump or charging system
							8. Inspect, flush, and replace heater components

6	5	4	3	2	1	0	R Frame-body and Unibody Construction and Repair
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							2. Identify types of damage
							3. Use and interpret specifications manuals
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							5. Analyze damage using tram and self-centering gauges
							6. Analyze damage using universal measuring system
							7. Analyze damage using dedicated measuring system

6	5	4	3	2	1	0	S Vehicle Structural Repair
							1. Straighten and align structural damage
							2. Replace component parts
							3. Perform stress relief using shock
							4. Perform stress relief using heat
							5. Replace high strength steel
							6. Section component parts
							7. Remove and reinstall mechanical components

6	5	4	3	2	1	0	T Steering and Suspension
							1. Identify suspension systems
							2. Perform suspension quick checks
							3. Remove and reinstall suspension systems
							4. Service suspension systems
							5. Identify steering systems
							6. Inspect, repair, and replace steering components
							7. Service power steering system
							8. Service brake systems
							9. Inspect, diagnose, and repair causes of tire wear patterns

**Lewis and Clark Career Center
Automotive Collision Technology Competencies**



6	5	4	3	2	1	0	T Steering and Suspension
							10. Perform four-wheel alignment
							11. Remove and install front drive trains

6	5	4	3	2	1	0	U. Detailing
							1. Apply decals and misc, exterior trim
							2. Demonstrate polishing techniques
							3. Clean exterior and glass surfaces
							4. Perform interior detailing
							5. Clean body opening
							6. Remove overspray

6	5	4	3	2	1	0	V. Leadership Competencies
							1. Demonstrate an understanding of VICA, its structure and activities
							2. Demonstrate an understanding of one's personal values
							3. Perform tasks related to effective personal management skills
							4. Demonstrate interpersonal skills
							5. Demonstrate etiquette and courtesy
							6. Demonstrate effectiveness in oral and written communication
							7. Develop and maintain a code of professional ethics
							8. Maintain a good professional appearance
							9. Perform basic tasks related to securing and terminating employment
							10. Perform basic parliamentary procedures in a group meeting

Curriculum Guide

1st YEAR AUTO COLLISION REPAIR

Mike Kuechler

Lewis and Clark Career Center

Big Ideas	Concepts	MLO's	Align to standards	Align to standards	Level of Knowledge	Type of assessment	other
Shop Safety	<ol style="list-style-type: none"> 1. Recognize safe work habits 2. Know equipment & shop safety 	<p>Students will:</p> <ol style="list-style-type: none"> 1. Achieve 100% on the SP2 online safety test 2. Demonstrate proper use of safety equipment 	<p>ASE TASK IV-A-1,2</p> <p>ASE TASK IV-A-1 thru 6</p>	<p>Show-Me Knowledge HP.3, HP.6, HP.7 Performance 1.4, 4.1, 4.7</p>	<p>Bloom's Cognitive Comprehension level Affective Responding level Psychomotor Precision level</p>	<ol style="list-style-type: none"> 1. Online safety test 2. Classroom discussions & quizzes 3. Shop observations 4. Individual demonstration 	
Careers in the Collision Field	Explore Employment possibilities	Students will : Describe types of positions in the industry	<p>ASE TASK None</p> <p>I-CAR explores careers positions</p>	<p>Show-Me Knowledge SS.4, Performance 1.4, 1.8, 2.6, 4.4, 4.8</p>	<p>Bloom's Cognitive Knowledge level Affective Receiving level</p>	<ol style="list-style-type: none"> 1. Classroom discussions & quizzes 2. Written report/essay 	
Employability Skills	<ol style="list-style-type: none"> 1. Learn desirable traits for employment 2. Sell your skills in writing 3. Display your skills in person 	<p>Students will:</p> <ol style="list-style-type: none"> 1. Demonstrate Communication skills verbal/non-verbal 2. Write a Resume 3. Participate in a interview 	<p>ASE TASK None</p> <p>NATEF identifies important work place skills</p>	<p>Show-Me Knowledge CA.1 Performance 1.4, 2.1, 2.6, 2.7, 4.4, 4.8</p>	<p>Bloom's Cognitive Application level Affective Valuing level Psychomotor Imitate level</p>	<ol style="list-style-type: none"> 1. Group interviews 2. Resume project 3. Written report/essay 	

Hand & Power Tools	<ol style="list-style-type: none"> 1. Recognize tools used in the collision industry 2. Know their abilities 3. Safely Use 	<p>Students will:</p> <ol style="list-style-type: none"> 1. Name tools 2. Explain uses 3. Demonstrate safe use of tools 	ASE TASK Assumed*	<p><u>Show-Me Knowledge</u> MA.1, SC.1, SC.2,</p> <p><u>Performance</u> 3.1, 4.7</p>	<p><u>Bloom's Cognitive</u> Application level</p> <p><u>Affective</u> Responding level</p> <p><u>Psychomotor</u> Manipulate level</p>	<ol style="list-style-type: none"> 1. Module test 2. Individual demonstration 3. Shop observations 	
Gas Metal Arc Welding	<ol style="list-style-type: none"> 1. Learn how to MIG Weld for Collision Repair 2. Recognize industry demands 	<p>Students will:</p> <ol style="list-style-type: none"> 1. Set up MIG Welders 2. Weld proficient to I-CAR standards 	ASE TASK I-D-1 thru 18	<p><u>Show-Me Knowledge</u> MA.1, MA.3, SC.2, SC.6,</p> <p><u>Performance</u> 1.4, 1.6, 3.2, 3.3, 3.4, 4.7</p>	<p><u>Bloom's Cognitive</u> Application level</p> <p><u>Psychomotor</u> Precision level</p>	<ol style="list-style-type: none"> 1. Module test 2. Individual demonstration 3. Weld project/test 	
Non-Structural Repair – Sheet Metal	<ol style="list-style-type: none"> 1. Making Cosmetic and Sheet Metal Repairs 2. Finishing repairs 	<p>Students will:</p> <ol style="list-style-type: none"> 1. Straighten metal 2. Apply filler and finish sand 	ASE TASK I-B-17, II-A-1,7, II-B-I-9,10,14,15,16, II-C-1 thru 10	<p><u>Show-Me Knowledge</u> SC.1, FA.2, MA.2</p> <p><u>Performance</u> 1.2, 1.4, 3.2, 3.3, 3.4, 3.6, 4.1</p>	<p><u>Bloom's Cognitive</u> Application level</p> <p><u>Psychomotor</u> Manipulate level</p>	<ol style="list-style-type: none"> 1. Module test 2. Individual demonstration 3. Shop observations 4. Panel project/graded 	
Measuring & Mixing	<ol style="list-style-type: none"> 1. Understanding fractional & metric measuring 2. Understanding mixing ratios for refinishing 	<p>Students will:</p> <ol style="list-style-type: none"> 1. Make 3 dimensional measurements of a unibody using measuring system 2. Mix paints properly as per directions 	ASE TASK I-A-1, I-B-1 thru 6, IV-D-2, 11	<p><u>Show-Me Knowledge</u> CA.1MA.1, MA.2, MA.4, MA.5</p> <p><u>Performance</u> 1.4, 1.7, 2.7, 3.4</p>	<p><u>Bloom's Cognitive</u> Application level</p> <p><u>Psychomotor</u> Precision level</p>	<ol style="list-style-type: none"> 1. Module test 2. Individual demonstration 3. Group project/set-up & measure 	

Intro to Refinishing	<ol style="list-style-type: none"> 1. Learn important information about spray guns 2. Understand spray gun set up 3. Techniques on using a spray gun 	<p>Students will:</p> <ol style="list-style-type: none"> 1. Identify spray gun parts, their functions & proper cleaning 2. Demonstrate how to set up gun for paint applications 3. Spray using correct gun techniques 	<p>ASE TASK IV-A-1 thru 6, IV-B-2 thru 9, 12, 13, 18, 19, 20, IV-C-1 thru 3, IV-D-1 thru 4, 12, 13</p>	<p>Show-Me Knowledge SC.1, SC.2 Performance 1.4, 2.5, 3.1, 3.2, 3.3, 4.7</p>	<p>Bloom's Cognitive Application level Psychomotor Manipulate level</p>	<ol style="list-style-type: none"> 1. Module test 2. Individual demonstration 3. Shop observations 4. Spray panel project/graded 	
Collision Repair Estimate	<ol style="list-style-type: none"> 1. Understanding the need and importance of a estimate 2. Understanding how to work from a estimate 3. Learn to use estimate for needed repair items 	<p>Students will:</p> <ol style="list-style-type: none"> 1. Write a hand written estimate using a estimating guide 2. Work from a estimate 3. Order parts and materials from a estimate 	<p>ASE TASK II-A-1, II-B-1</p>	<p>Show-Me Knowledge CA.4, MA.1, MA.2, MA.6, SC.1, SC.2 Performance 1.4, 2.1, 2.7, 3.3, 4.7</p>	<p>Bloom's Cognitive Analysis level Affective Receiving level Psychomotor Manipulate level</p>	<ol style="list-style-type: none"> 1. Module test 2. Written report/essay 3. Group written estimate 4. Individual written estimate 	
Plastic Repair	<ol style="list-style-type: none"> 1. Learn how to identify and repair plastics used on today's vehicles 2. Learn industry standards for plastic repair 	<p>Students will:</p> <ol style="list-style-type: none"> 1. Interpret Symbols or ISO codes 2. Demonstrate proper repair techniques on a variety of plastics 	<p>ASE TASK II-F-1 thru 5</p>	<p>Show-Me Knowledge CA.3, MA.1, SC.1, FA.2 Performance 1.2, 1.4, 1.5, 3.2, 3.3, 3.4, 4.7</p>	<p>Bloom's Cognitive Application level Psychomotor Manipulate level</p>	<ol style="list-style-type: none"> 1. Module test 2. Individual demonstration 3. Plastic repair project/graded 	

Detailing for Customer Satisfaction	<ol style="list-style-type: none"> 1. Recognize paint problems 2. Learn to fix common problems 3. Develop good after collision clean up skills & habits 	<p>Students will:</p> <ol style="list-style-type: none"> 1. Repair common paint defects 2. Demonstrate color sanding & buffing techniques 3. Clean interior & exterior with extra detail 	<p>ASE TASK IV-E-1 thru 11, 19 thru 24, 27, IV-F-1 thru 5</p>	<p>Show-Me Knowledge CA.3, SC.2</p> <p>Performance 3.1, 3.2, 3.3, 4.7</p>	<p>Bloom's Cognitive Application level</p> <p>Affective Receiving level</p> <p>Psychomotor Manipulate</p>	<ol style="list-style-type: none"> 1. Module test 2. Defect ID test 3. Shop observations 4. Individual demonstration 5. Skills car wash 	
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* ASE has established general areas in which it is assumed that the student has received the necessary training to perform the task.

Rationale for choosing my standards Mike Kuechler Auto Collision Repair Lewis and Clark Career Center

I chose the ASE or NATEF standards because these are the standards that the automotive industry recognizes both professionally and academically. These are standards that a technician is expected to have a high level of proficiency when employed in today's work force. I-Car (Inter-Industry Conference on Auto Collision Repair) also is aligned with ASE and NATEF and could have been included. The Show-Me Standards also sets standards along the knowledge and performance areas of the curriculum and should be aligned to meet the states goal of student success.

Websites

Websites that follow my curriculum are: I-CAR.com where I can access the Collision Repair Instructors Network (CRIN) for any help or information concerning my curriculum and talk with other instructors who teach at the secondary and post-secondary level. I did find Autobodyman.com website but it didn't have much information and wasn't a good site for instructors.

While doing my alignment I felt that the level of expectation was where it should be for junior and senior high school students in auto collision repair. Knowledge and skill will improve with experience that will only be obtained once they begin working in their trade. I feel that this is a comfortable level for them to learn at without being so overwhelmed that they begin to feel discouraged.

I determined that in the Cognitive Domain 9 out of 11 MLO's where in the Application level or higher which equals roughly 90 percent towards the upper level. Only 6 MLO's were aligned with the Affective Domain with the larger percentage in the lower end of the domain. Finally in the Psychomotor Domain 10 MLO's were aligned with the Manipulate level having the highest percentage with 6.

NOTE: Numbers in parentheses at the end of each competency apply to national skill standards by ASE. *(NOTE: These competencies are addressed on the Missouri VICA Curriculum Guide lessons.)

Auto Collision Technology

Cross-Reference to Show-Me Standards (main report)

Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication Arts	Science	Social Studies	Health / Physical Education	Fine Arts
A1	SS.4	1.4				SS/WA/9-12/2/b		
		2.6				SS/WD/9-12/1/d		
		3.8				SS/WD/9-12/2/e		
		4.4				SS/WD/9-12/3/k		
A2	SC.2	1.8			SC/WA/9-12/1/a			
		4.7			SC/WB/9-12/1/a			
B1	MA.1 MA.2	1.4	MA/I./9-12/2/e					
		3.4	MA/VI./9-12/2/c					
B2	MA.1 MA.2 MA.4	1.4	MA/I./9-12/2/c					
		1.7	MA/I./9-12/2/e					
		2.7	MA/I./9-12/4/e					
		3.4	MA/III./9-12/3/b					
C1	HP.2	4.7						
C2	HP.2	4.7						
C3	HP.2	4.7						
C4	HP.2	4.7						
C5	SC.1 SC.2	1.4			SC/WA/9-12/1/a			
		3.1			SC/WB/9-12/1/a			
C6	SC.1 SC.2	1.4			SC/WA/9-12/1/a			
		3.1			SC/WB/9-12/1/a			
					SC/WC/9-12/1/a			
D1	HP.3 HP.6 HP.7	1.4						
		2.3						
		4.7						
D2	HP.3	1.4				HP/III.D/9-12/1/a		
		2.3						
D3	HP.3	4.1						
		1.4				HP/III.D/9-12/1/a		

KEY: * = may use all "to do" statements # = same Frameworks as previous competency
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Auto Collision Technology

Cross-Reference to Show-Me Standards (main report)

Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication Arts	Science	Social Studies	Health / Physical Education	Fine Arts
D4	HP.3	1.4 2.3 4.1					HP/III/D/9-12/1/a	
D5	HP.3	1.4 2.3 4.1					HP/III/D/9-12/1/a	
D6	HP.3	1.4 2.3 4.1					HP/III/D/9-12/1/a	
D7	HP.3	1.4 2.3 4.1					HP/III/D/9-12/1/a	
D8	HP.3	1.4 2.3 4.1					HP/III/D/9-12/1/a	
D9	HP.3						HP/III/D/9-12/1/a	
E1	CA.4 MA.6 SC.1	1.4 2.7 3.3 4.7	MA/VI./9-12/2/a	CA/IV./9-12/1/e	SC/IIA/9-12/4/a			
E2	CA.4 MA.2 SC.1	1.4 2.7 3.3 4.7	MA/VI./9-12/2/a	CA/IV./9-12/1/e	SC/IIA/9-12/4/a			
E3	CA.4 MA.2 SC.1	1.4 2.7 3.3 4.7	MA/VI./9-12/2/a	CA/IV./9-12/1/e	SC/IIA/9-12/4/a			
F1	CA.3 MA.1	1.6 3.4	MA/II./9-12/4/e	CA/II./9-12/6/c				
F2	HP.1	4.3					HP/III/D/9-12/1/a	

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Cross-Reference to Show-Me Standards (main report)

Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication Arts	Science	Social Studies	Health / Physical Education	Fine Arts
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F3	FA1	14	SC/1A/9-12/4/a	SC/III.B/9-12/2/a	FA/IV.D/9-12/2/b		HP/IV.C/9-12/1/a	
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F4	HP7	14	SC/1A/9-12/4/a	HP/IV.C/9-12/1/a				
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F5	HP7	14	SC/1A/9-12/4/a	HP/IV.C/9-12/1/a				
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F6	SC1	14	SC/1A/9-12/4/a	SC/IV.C/9-12/1/a				
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F7	SC1	14	SC/1A/9-12/4/a	SC/IV.C/9-12/1/a				
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F8	SC1	14	SC/1A/9-12/4/a	SC/IV.C/9-12/1/a				
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F9	SC1	14	SC/1A/9-12/4/a	SC/IV.C/9-12/1/a				
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F10	HP1	43	HP/III.D/9-12/1/a	HP/IV.C/9-12/1/a				
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F11	FA1	14	SC/1A/9-12/4/a	SC/III.B/9-12/2/a	FA/IV.D/9-12/2/b			
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F12	FA1	14	SC/1A/9-12/4/a	SC/III.B/9-12/2/a	FA/IV.D/9-12/2/b			
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F13	HP2	16	HP/IV.D/9-12/3/a	HP/IV.C/9-12/1/a				
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G1	SC1	12	SC/III.C/9-12/3/a					
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G2	HP3	14	HP/III.A/9-12/10/a					
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Auto Collision Technology

Cross-Reference to Show-Me Standards (main report)

Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication Arts	Science	Social Studies	Health / Physical Education	Fine Arts
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G3	MA2	14	MA.1 /9-12/4/c					
G4	SC1	36	SC /III.C/9-12/4/a					
G5	HP3	14	MA.1 /9-12/4/c		SC /III.C/9-12/4/a		HP /III.A/9-12/10/a	
G6	FA2	36						
G7	FA2							
G8		47					HP /III.A/9-12/10/a	
G9	SC2	14			SC /III.C/9-12/3/a			
H1	SC1	27			SC /III.C/9-12/3/a			
H2	SC1	27			SC /III.C/9-12/3/a			
H3	HP3	14					HP /III.A/9-12/10/a	
H4	HP3	14					HP /III.A/9-12/10/a	
H5	HP3	14					HP /III.A/9-12/10/a	
H6	HP3	14					HP /III.A/9-12/10/a	
H7	HP3	14					HP /III.A/9-12/10/a	
H8	FA2	12						
H9	FA2	12					HP /III.A/9-12/10/a	
H10	GA6	41	GA.1 /9-12/2/a					
H11	HP3	14					HP /III.A/9-12/10/a	
H12	HP3	14					HP /III.A/9-12/10/a	
H13	HP3	14					HP /III.A/9-12/10/a	
H14	HP3	14					HP /III.A/9-12/10/a	
L1	HP3	47					HP /III.A/9-12/10/a	
L2	SC1	12			SC /III.C/9-12/3/a			

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Auto Collision Technology

Cross-Reference to Show-Me Standards (main report)

Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication Arts	Science	Social Studies	Health / Physical Education	Fine Arts
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13	SC 1	14	SC/III C/9-12/3/a					
14	SC 1	14	SC/III C/9-12/3/a					
15	FA2	32						
J1	SC 1	33	SC/III C/9-12/3/a					
J2	SC 1	33	SC/III C/9-12/3/a					
J3	SC 1	33	SC/III C/9-12/3/a					
J4	SC 1	33	SC/III C/9-12/3/a					
J5	SC 1	33	SC/III C/9-12/3/a					
J6	HP3	14	SC/III C/9-12/3/a				HP/III A/9-12/10/a	
K1	SC 1	27	SC/IIA/9-12/4/a					
K2	SC 1	27	SC/IIA/9-12/4/a					
K3	SC 1	27	SC/IIA/9-12/4/a					
K4	SC 1	27	SC/IIA/9-12/4/a					
L1	CA6	17	CA/IV /9-12/3/a					
L2	HP5	37					HP/VC/9-12/2/a	
L3	CA5	46	CA/IV /9-12/1/1					
L4	CA5	110	CA/IV /9-12/1/1					
L5	CA5	46	CA/IV /9-12/1/a					
L6	CA6	18	SC/VIII B/9-12/1/a				HP/IV B/9-12/1/a	
M1	CA7	14	CA/III /9-12/1/1				HP/VA/9-12/1/a	
M2	CA5	14	CA/II /9-12/6/c				HP/IV B/9-12/1/a	
	HP6	110						
	SC7	31						

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Auto Collision Technology

Cross-Reference to Show-Me Standards (main report)

Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication Arts	Science	Social Studies	Health / Physical Education	Fine Arts
M3	CA 5	14		CA/IV /9-12/1/a				
M4	CA 5 SC 1	14 110		CA/IV /9-12/1/f	SC/IIA/9-12/4/a			
M5	CA 5 SC 1	14 110		CA/IV /9-12/1/f	SC/IIA/9-12/4/a			
M6	CA 5	14		CA/IV /9-12/1/a				
M7	HP 6 SC 1	11 31			SC/IIA/9-12/4/a		HP/IVB/9-12/1/a	
M8	CA 5 SC 1	14 110		CA/IV /9-12/1/a	SC/IIA/9-12/4/a			
M9	CA 5 HP 6 SC 1	14 31		CA/III /9-12/1/a	SC/IIA/9-12/4/a		HP/IVB/9-12/1/a	
M10	MA 1 MA 5 SC 8	16 18 32		MA/II /9-12/2/a MA/II /9-12/4/c	SC/IIIA/9-12/1/a			
M11	MA 1 MA 5 SC 8	16 18 32		MA/II /9-12/2/a MA/II /9-12/4/c	SC/IIIA/9-12/1/a			
M12	MA 1 MA 5 SC 8	16 18 32		MA/II /9-12/2/a MA/II /9-12/4/c	SC/IIIA/9-12/1/a			
M13	MA 1 MA 5 SC 8	16 18 32		MA/II /9-12/2/a MA/II /9-12/4/c	SC/IIIA/9-12/1/a			
M14	MA 2 SC 7	16 33		MA/II /9-12/4/d	SC/IIIA/9-12/3/a			
M15	CA 5	16		CA/II /9-12/6/c				
M16	CA 5 MA 1	14 18		MA/II /9-12/2/a CA/II /9-12/6/a				
M17	CA 5	14		MA/II /9-12/2/a CA/II /9-12/6/a				

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Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication Arts	Science	Social Studies	Health / Physical Education	Fine Arts
M18	CA5 SC1	14 16		CA/IV./9-12/1/b	SC/IVC/9-12/2/a			
M19	CA5 SC1	14 16		CA/IV./9-12/1/b	SC/IVC/9-12/2/a			
M20	CA5 SC1	14 16		CA/IV./9-12/1/b	SC/IVC/9-12/2/a			
N1	CA3 MA1 MA2	16 34	MA/II./9-12/1/a MA/III./9-12/2/a	CA/II./9-12/6/c				
N2	CA3 MA1 MA2	12 34	MA/II./9-12/1/a MA/III./9-12/2/a	CA/II./9-12/6/c				
N3	CA3 MA1 MA2	16 34	MA/II./9-12/1/a	CA/II./9-12/6/c				
N4	CA3 MA1 MA2	16 34	MA/II./9-12/1/a	CA/II./9-12/6/c				
O1	SC1 SC2 SC6	14 16 110			SC/IIA/9-12/4/a SC/IVC/9-12/1/a SC/IVC/9-12/2/a			
O2	SC1 SC2 SC6	14 16 110			SC/IIA/9-12/4/a SC/IVC/9-12/1/a SC/IVC/9-12/2/a			
O3	SC1 SC2 SC6	14 16 110			SC/IIA/9-12/4/a SC/IVC/9-12/1/a SC/IVC/9-12/2/a			
O4	MA1 SC1 SC2 SC6	14 16 110	MA/II./9-12/4/d		SC/IIA/9-12/4/a SC/IVC/9-12/1/a SC/IVC/9-12/2/a			

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Auto Collision Technology

Cross-Reference to Show-Me Standards (main report)

Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication Arts	Science	Social Studies	Health / Physical Education	Fine Arts
O5	MA 1	1.4	MA/1./9-12/4/d		SC/1/A/9-12/4/a			
	SC 1	1.6			SC/IV/C/9-12/1/a			
	SC 2	1.10			SC/IV/C/9-12/2/a			
	SC 6							
P1	HP 3	1.10			SC/1/A/9-12/4/a		HP/III/A/9-12/10/a	
	SC 1	4.7						
P2	HP 3	1.10			SC/1/A/9-12/4/a		HP/III/A/9-12/10/a	
	SC 1	4.7						
P3	FA 1	1.10			SC/1/A/9-12/4/a		HP/III/A/9-12/10/a	FA/IV/D/9-12/2/b
	HP 3	4.7						
	SC 1							
P4	SC 1	1.4			SC/1/A/9-12/4/a			
	SC 5	1.10						
Q1	CA 3	1.6		CA/1./9-12/6/c	SC/III/C/9-12/3/a			
	SC 1	2.7						
Q2	HP 3	1.10			SC/1/A/9-12/4/a		HP/III/A/9-12/10/a	
	SC 1	4.7						
Q3	HP 3	1.10			SC/1/A/9-12/4/a		HP/III/A/9-12/10/a	
	SC 1	4.7						
Q4	HP 3	1.10			SC/1/A/9-12/4/a		HP/III/A/9-12/10/a	
	SC 1	4.7						
Q5	HP 3	1.10			SC/1/A/9-12/4/a		HP/III/A/9-12/10/a	
	SC 1	4.7						
Q6	HP 3	1.10			SC/1/A/9-12/4/a		HP/III/A/9-12/10/a	
	SC 1	4.7						
Q7	SC 1	1.4			SC/1/A/9-12/4/a			
	SC 5	1.10						
	SC 1	1.10			SC/1/A/9-12/4/a			
Q9	HP 4	1.10			SC/1/A/9-12/4/a			
	SC 1							
Q10	HP 4	1.4			SC/1/A/9-12/4/a	SS/1/D/9-12/5/m		
	SC 1	1.10						

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Auto Collision Technology

Cross-Reference to Show-Me Standards (main report)

Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication Arts	Science	Social Studies	Health / Physical Education	Fine Arts
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Q.11	SC.1	1.10			SC/1A/9-12/4/a			
Q.12	SC.1	1.4			SC/1A/9-12/4/a	SS/1D/9-12/5/m		
	SS.7	1.10						
Q.13	SC.1	2.7			SC/III.C/9-12/3/a			
Q.14	SC.1	1.10			SC/1A/9-12/4/a			
Q.15	SC.1	1.4			SC/1A/9-12/4/a	SS/1D/9-12/5/m		
	SC.2	1.10						
	SS.7	3.1						
R.1	SC.1	3.3			SC/1A/9-12/4/a			
R.2	SC.1	3.3			SC/1A/9-12/4/a			
R.3	SC.1	3.3			SC/1A/9-12/4/a			
R.4	HP.3	1.4			SC/1A/9-12/4/a	HP/III.A/9-12/10/a		
	SC.1	3.3						
R.5	SC.1	3.3			SC/1A/9-12/4/a			
R.6	SC.1	3.3			SC/1A/9-12/4/a			
R.7	SC.1	3.3			SC/1A/9-12/4/a			
R.8	SC.1	3.3			SC/1A/9-12/4/a			
R.9	SC.1	3.3			SC/1A/9-12/4/a			
R.10	SC.1	3.3			SC/1A/9-12/4/a			
R.11	SC.1	3.3			SC/1A/9-12/4/a			
R.12	SC.1	1.2			SC/1A/9-12/4/a			
S.1	CA.3	1.1			MA/1.9-12/4/d	CA/III.9-12/1/a		
	MA.1	3.1			MA/II.9-12/3/h	CA/III.9-12/1/d		
						CA/III.9-12/1/l		
S.2	HP.1	3.2			SC/III.A/9-12/3/a	HP/1A/9-12/1/a		
	SC.1	4.7			SC/III.B/9-12/4/a			
					SC/III.C/9-12/1/a			

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Auto Collision Technology

Cross-Reference to Show-Me Standards (main report)

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S3	CA3	41		CA/I /9-12/98/#				
S4	CA3	41		CA/III /9-12/1/a CA/III /9-12/1/j				
T1	CA3	41		CA/III /9-12/1/a CA/III /9-12/1/d CA/III /9-12/1/i				
T2	CA3	41		CA/I /9-12/98/#				
T3	CA3	41		CA/I /9-12/98/#				
T4	CA3	41		CA/I /9-12/98/#				
U1	CA1 MA1	32	MA/I /9-12/3/d	CA/III /9-12/1/a				
U2	SC2	32		SC/III.C/9-12/4/a				
U3	SC3	32		SC/III.A/9-12/3/a				
U4	SC3	32		SC/III.C/9-12/4/a				
U5	SC2	31		SC/III.C/9-12/4/a				
U6	SC2	32		SC/III.C/9-12/4/a				
U7	CA3 SC7	1.10 32		SC/VIII.B/9-12/1/a				
V1	CA3 HP6 MA1 SC1 SC2 SC8 SS4	14 31 32 35 44 47	MA/IV /9-12/3/a	CA/I /9-12/2/d CA/III /9-12/1/a	SC/II.A/9-12/4/a SC/III.B/9-12/2/a SC/VI.A/9-12/2/a	SS/II.D/9-12/4/j	HP/III.D/9-12/2/a	
V2	SC2	31		SC/II.A/9-12/4/a				
V3	SC2	31		SC/II.A/9-12/4/a				
V4	SC2	31		SC/II.A/9-12/4/a				
V5	SC2	31		SC/II.A/9-12/4/a				

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Auto Collision Technology

Cross-Reference to Show-Me Standards (main report)

Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication Arts	Science	Social Studies	Health / Physical Education	Fine Arts
V.6	SC.2	3.1			SC/1.A/9-12/4/a			
V.7	SC.2	3.1			SC/1.A/9-12/4/a			
V.8	SC.2	3.2			SC/1.A/9-12/4/a			
W.1	CA.3 SC.7	1.1 3.2		CA/III/9-12/1/a	SC/VIII.B/9-12/1/a			
W.2	CA.1 MA.1 SC.2	1.4 1.8 3.1	MA/V./9-12/3/a		SC/1.A/9-12/4/a			
W.3	CA.1 MA.1 SC.2	1.4 1.8 3.1 3.2	MA/V./9-12/3/a		SC/1.A/9-12/4/a			
W.4	SC.2	3.2			SC/1.A/9-12/4/a			
W.5	HP.6	4.5			SC/1.A/9-12/4/a			
W.6	SC.1 SC.2	3.1 3.2						
W.7	SC.2	3.2						
W.8	SC.2	3.2			SC/1.A/9-12/4/a			
W.9	CA.1 MA.1 SC.2	1.4 1.8 3.1	MA/V./9-12/3/a		SC/1.A/9-12/4/a			
W.10	SC.2	3.2			SC/1.A/9-12/4/a			
W.11	CA.1 MA.1 SC.2	1.4 1.8 3.1	MA/V./9-12/3/a		SC/1.A/9-12/4/a			
W.12	CA.1 CA.3 MA.1 SC.2 SS.4	1.4 1.8 3.1 3.2 4.4	MA/V./9-12/3/a			SS/II.D/9-12/4/j		

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Auto Collision Technology

Cross-Reference to Show-Me Standards (main report)

Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication Arts	Science	Social Studies	Health / Physical Education	Fine Arts
W 13	SC 2	32			SC/1A/9-12/4/a			
X 1	CA 3 MA 2	14 15	MA/1./9-12/1/a	CA/1./9-12/1/a				
X 2	CA 1 CA 3	15 22		CA/1./9-12/1/a				
X 3	CA 3 MA 1 MA 2	14 15 31	MA/1./9-12/1/b MA/VIII./9-12/5/a	CA/1./9-12/1/a				
X 4	CA 3 MA 1 MA 3	14 15 35	MA/1./9-12/3/b MA/VII./9-12/5/a	CA/1./9-12/1/a				
X 5	CA 3 MA 2	14 15	MA/1./9-12/1/a	CA/1./9-12/1/a				
X 6	CA 3 MA 2 MA 3 SC 5	14 18 35	MA/1./9-12/1/b MA/VIII./9-12/1/b	CA/1./9-12/2/c	SC/1A/9-12/1/a			
X 7	CA 3 MA 2 MA 3 SC 5	14 18 35	MA/1./9-12/1/b MA/VII./9-12/1/b	CA/1./9-12/2/c	SC/1A/9-12/1/a			
X 8	CA 3 MA 2 MA 3 SC 5	14 18 35	MA/1./9-12/1/b MA/VII./9-12/1/b	CA/1./9-12/2/c	SC/1A/9-12/1/a			
X 9	CA 3 MA 2 SC 5	14 18	MA/1./9-12/1/a MA/1./9-12/1/b MA/VIII./9-12/1/b	CA/1./9-12/2/c	SC/1A/9-12/1/a			
Y 1	CA 5 MA 1 SC 1	16 37 46	MA/1./9-12/2/a	CA/IV./9-12/1/b	SC/11B/9-12/1/a			
Y 2	CA 5	16	MA/1./9-12/2/a	CA/IV./9-12/1/b	SC/11B/9-12/1/a			

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Auto Collision Technology

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Duty Band and Task Statement	Knowledge (Content)	Performance (Goals)	Math	Communication	Science	Social Studies	Health / Physical Education	Fine Arts
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Y3	CA.5	37	CA/IV./9-12/1/b	SC/II/B/9-12/1/a				
	SC.1	46						
Y4	CA.5	37	CA/IV./9-12/1/b	SC/II/B/9-12/1/a				
	SC.1	46						
Y5	CA.5	16	MA/1./9-12/2/a	CA/IV./9-12/1/b	SC/II/B/9-12/1/a			
	MA.1	37						
	SC.1	46						
Y6	CA.5	16	MA/1./9-12/2/a	CA/IV./9-12/1/b	SC/II/B/9-12/1/a			
	MA.1	37						
	SC.1	46						
Y7	CA.5	16	MA/1./9-12/2/a	CA/IV./9-12/2/a	SC/II/B/9-12/1/a			
	MA.1	37						
	SC.1	46						
Y8	CA.5	31	MA/1./9-12/2/b	CA/IV./9-12/2/a	SC/II/B/9-12/1/a			
	MA.4	37						
	SC.1	46						
Z1	CA.1	42	CA/1./9-12/1/b					
	CA.3	43						
Z2		44						
		45						
		46						
Z3	CA.5	43	CA/1./9-12/3/b					
		44						
Z4	CA.1	21						
		22						
		23						
		27						
Z5		23						
		44						
Z6	CA.1	21	CA/1./9-12/1/b					

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Auto Collision Technology

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27		4.4						
28		4.3						
29		2.6 4.8						
2.10	CA 6	4.6						

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**PROGRAM ARTICULATION AGREEMENT
FOR
THE TECHNICAL CAREER PATHWAYS PROGRAM
*Lewis and Clark Vocational School***

All credit is awarded on the basis that students have successfully completed the prerequisites for each course. Students are to provide competencies of their vocational technical program as well of letters of recommendation to accompany their petition for credit. All credit which is to be awarded is subject to: possessing the required number of competencies; receiving favorable letters of recommendations (to include comments about work ethic, attendance, interpersonal communication, appearance, motivation, industriousness; passing a written and performance examination covering the competencies which are part of the Ranken Technical College course.

The first term or semester of technical courses listed below will be articulated based upon successful completion of a 2 year program at a vocational technical school, favorable letters of recommendation (to cover our work ethic component), possessing the required number of competencies and a proficiency test (written and performance) given by Ranken Technical College with a grade of "B" or higher. The written test for all eligible programs* must be completed successfully before the performance testing will be administered.

<u>Lewis & Clark Program Title</u>	<u>Ranken Course Title</u>	<u>Credit Hours</u>
Design Drafting/CAD	1st semester, Architectural Technology	14
Auto Collision Repair	1st term, Automotive Collision Repair	10
Auto Service Technology	1st term, Automotive Maintenance Technology	10
Building Trades	1st term, Carpentry and Building Construction	10
Electrical Trades	1st term, Industrial Electricity/Electronics Technology	10
Electronics	1st term, Electronics Engineering Technology	10
Heating, Ventilation, and Air Conditioning (HVAC)	1st semester, Refrigeration/Air Conditioning/Heating	15
Computer Information Systems	1st term Computer Networking Technology	10

*Some technical programs may be excluded from the articulation agreement.

Kenneth C. Cobb
Signature
Voc Director
Title
11-2-98
Date

Debra R. McPeak
Signature
Dean
Title

Debra R. McPeak, Ph.D, Dean of Enrollment Services
Ranken Technical College



Lewis & Clark Career Center
Advisory Meeting
May 13, 2009
Agenda

1. Attendance
2. Reading of minutes
3. Approve budget.
4. Senior Rec. Nite. Tool Box Presentation
5. 09-2010 Goals
6. Possible hosting Skills USA in 201
7. Set new meeting schedule for 2009-2010
8. New business

Metropolitan Vocational-Technical Assistance Program
Member List
October 2008

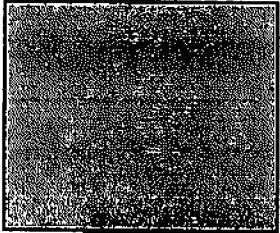
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Mr. Mike Croker Automotive Technology 544 Mae Court Fenton, MO 63026	(636) 343-8101 mikec@automotivetechology.com	(636) 343-5597
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Mr. John Helterbrand Ranken Technical College 4431 Finney Avenue St. Louis, MO 63113	(314) 286-4889 jhelterbrand@ranken.edu	(314) 371-0241
Mr. Rich Lanfersieck Spirit West Motor Carriage Body Repair 610 Park Lane Ballwin, MO 63011	(636) 394-1712 tsaake@sbcglobal.net	(636) 394-3564
Mr. Ken Kohnen Snelson Collision Repair 1822 Grand Avenue Granite City, IL 62040	(618) 452-7165 kennykohnen@sbcglobal.net	
Mr. Mike Kuechler Lewis & Clark Career 2400 Zumbahl Road St. Charles, MO 63301	(636) 443-4984 mkuechler@mail.stcharles.k12.mo.us	

Metropolitan Vocational-Technical Assistance Program

Member List

October 2008

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Mr. Don Roberts Jonesburg, MO	Cell (314) 606-4995	
Mr. Dan Shymanski State Farm Insurance 520 Maryville Center St. Louis, MO 63141	(314) 439-3567 dshymansi@charter.net	
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Mr. Doug Slattery Automotive Technology 544 Mae Court Fenton, MO 63026	(636) 343-8101 doug@sutomotivetechology.com	(636) 343-5597
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Mr. Anthony Woodside South County Tech 12721 West Watson Rd Sunset Hills, MO 63127	(314) 989-7435 Classicwoody@yahoo.com	(314) 989-7305



Non-Structural Supplement

Activities And Demonstrations



MODULE 1—STEEL USED IN VEHICLE CONSTRUCTION**A-4****GRAIN PATTERN****Activity Prop**

- Bendable piece of mild steel for each student

Activity

Have the students bend a piece of sheet metal back and forth. Explain to the students how heat is produced by the friction in the grain structure.

A-10**ELASTIC AND PLASTIC DEFORMATION****Demonstration Props**

- 2-4 flat pieces of mild steel approximately 380-430 mm (15-17")
- Vise

Demonstration

Use a flat piece of steel and a vise to demonstrate the difference between elastic and plastic deformation. Show the students that when the steel is bent slightly, it springs back to its original state. Explain that this is elastic deformation. Next, bend the steel beyond its elastic limit. Show the students that the metal springs back but not to its original shape because the elastic limit has been surpassed. This is plastic deformation. Explain that this is how metal is formed.

A-11**WORK HARDENING****Demonstration Prop**

- Piece of welding wire or a paper clip

Demonstration

Use a piece of welding wire or paper clip to show work hardening and plastic deformation. When the wire is bent back and forth several times, plastic deformation will occur at the point of the bend. The plastic deformation causes the metal to become hard. This increased hardness is called work hardening.

B-1**BODY REPAIR MANUAL****Demonstration Props**

- Body repair manuals that indicate the different types of steel found on a vehicle

Demonstration

Show the students an example of a body repair manual from a vehicle maker that identifies the types of steel used to make that vehicle.

B-6**FILM THICKNESS****Activity Props**

- Bare piece of sheet metal
- Galvanized piece of sheet metal
- 9 mil paint chip
- 2 mil plastic sheet
- 5 mil plastic sheet
- Digital film thickness gauge

Activity

Pass around a bare piece of sheet metal and a galvanized piece of sheet metal for the students to compare. Then pass around a piece of cellophane coated with 9 mils of refinish material and ask the students to guess the thickness. Then measure the chip. Pass around sheets of 2 mil and 5 mil plastic or cellophane. Also state that one page of the Objectives Worksheet is about 3 mils thick.

C-5**STRETCHER STRAINS****Demonstration Prop**

- Example of stretcher strains in a part

Demonstration

Show the students an example of stretcher strains.

C-7

SOLID VS. BOXED AND PARTIALLY BOXED

Demonstration Props

- Example of a solid area
- Example of a boxed area
- Example of a partially boxed area

Demonstration

Show the students examples of solid, boxed, and partially boxed areas.

D-9

CROWNED PANELS

Activity Props

- High crown panel
- Low crown panel
- Combined crown panel
- Reverse crown panel

Activity

Have the students identify different crowns on actual parts.

MODULE 2—REPAIRING DAMAGE**B-4****USING A STRAIGHTEDGE****Activity Props**

- Damaged panel with high and low spots
- Straightedge

Activity

Demonstrate how to use a straightedge to identify high and low spots. Then, have the students do the same.

B-5**IDENTIFYING HIGH AND LOW SPOTS USING LIGHT****Activity Props**

- Damaged panel with high and low spots
- Light source

Activity

Demonstrate how to use light to identify high and low spots. Then, have the students do the same.

B-6**IDENTIFYING HIGH AND LOW SPOTS BY FEEL****Activity Props**

- Repaired panel with damage that can be felt, but not seen (a repair area with body filler applied and sanded may work well for this)
- Gloves and/or a clean cloth

Activity

Demonstrate how to feel high and low spots. Have the students feel the panel with their bare hands and again ask them to indicate the area(s) that have high and low spots. Next, have the students feel the panel with either a glove or a clean cloth. Again, have them indicate where the high and low spots are located. For those students that cannot feel the high and low spots, assist them in identifying the areas. Explain to the students that this is a skill that they will have to learn to make undetectable repairs.

B-7

USING A BODY FILE

Activity Props

- Damaged panel with high and low spots
- Body file

Activity

Demonstrate how to use a body file or sandpaper to identify high and low spots. Then, have the students do the same.

C-2

NEWTON'S LAWS OF MOTION

Activity Prop

- Paper
- Pencil
- Calculator

Activity

Give the students examples of Newton's First Law Of Motion such as a tissue box on the package tray of a vehicle. Using the second law of motion, calculate force.

D-6

BODY HAMMER HEAD TYPES

Demonstration Props

- Assortment of body hammers

Demonstration

Show the students body hammers with different types of heads that can be used for body repair.

D-9**HOLDING A HAMMER****Activity Props**

- Body repair hammer for each Student

Activity

Show the students how to hold a body hammer. Walk around the classroom and make sure the students are holding the hammer properly.

D-12**LOCATING THE HAMMER ON THE PANEL BACKSIDE****Activity Props**

- Hoods, fenders, or other panels with access to the panel backside
- Pick hammers for each student
- Felt-tip marker or grease pen
- Safety glasses for each student

Activity

Draw a circle on a panel and mark an "X" in the middle of the circle. Tell the students that their goal is to consistently strike the backside of the panel with the pick hammer and raise the middle of the "X" while looking from the front side. Explain that this skill is important because they will often have limited access to the backside and must be able to determine where they are striking with a hammer or where they are placing, or striking, with a dolly.

D-13**HAMMER MAINTENANCE****Demonstration Props**

- Hammer with minor surface imperfections
- Vise
- Fine-tooth file
- Sandpaper and a sanding block or an oil stone
- Paint or a grease marker
- Flat piece of steel

Demonstration

1. Clamp the hammer in a vise face-up.
2. File the hammer face in all directions using a flat fine tooth metal file. Do NOT file in only one direction.
3. File the hammer face so that it is slightly crowned, not flat.
4. After smoothing with the file, polish the face with fine sandpaper or an oil stone.
5. Apply paint, or a grease marker, to the hammer face and hit a flat piece of sheet metal while the paint is still wet.

Explain to the students that the paint should come off of the center of the hammer face and if the paint comes off of a section other than the center of the face, the hammer should be filed and polished again.

E-1**DOLLY TYPES****Demonstration Props**

- Assortment of dollies

Demonstration

Show the students different types of dollies that can be used for body repair. Explain the different types and what they may be used for.

E-4

USING A DOLLY AS A HAMMER

Activity Props

- Dolly
- Panel to strike

Activity

Demonstrate how to use a dolly as a hammer. Then, have the students do the same.

F-6

HAMMER-ON-DOLLY

Activity Props

- Body hammer
- Dolly
- Panel to strike

Activity

Demonstrate how to use the hammer-on-dolly technique. Then, have the students do the same.

F-8

HAMMER-OFF-DOLLY

Activity Props

- Body hammer
- Dolly
- Panel to strike

ACTIVITY

Demonstrate how to use the hammer-off-dolly technique. Then, have the students do the same.

G-2

SPOON DESIGNS

Demonstration Props

- Various spoons

Demonstration

Show the students examples of different types of spoons.

G-7

USING A SPOON WITH A HAMMER

Activity Props

- Body hammer
- Spoon
- Panel to strike

Activity

Demonstrate how to use a spoon with a hammer. Then, have the students do the same. A ball peen or dead blow hammer should be used, not a body hammer.

G-9

USING A SPOON LIKE A BODY HAMMER

Activity Props

- Spoon
- Panel to strike

Activity

Demonstrate how to use a spoon like a body hammer. Then, have the students do the same.

J-2**LOCATING STRETCHED AREAS****Activity Prop**

- Panel with areas where the metal has been stretched and areas where shrinking has been done

Activity

Demonstrate how to locate a stretched area. Then, have the students do the same.

J-7**TEMPERATURE INDICATORS****Demonstration Props**

- Panel to heat
- Heat source such as a propane or butane torch
- Heat detection crayon
- Heat detection paint
- Heat monitoring strips
- Noncontact thermometer
- Thermocouple with a DVOM

Demonstration

Show the students examples of temperature indicators and how they work.

M-5**SLIDEHAMMER****Demonstration Prop**

- Slidehammer

Demonstration

Show the students a slidehammer and explain how it is used. If possible, have different types available such as those used with pins, washers, and dedicated weld-on dent removal tools.

M-6**SPOT WELDER ATTACHMENTS****Demonstration Props**

- Spot welder slidehammer attachment
- Spot welder mechanical handle attachment
- Ground attachment

Demonstration

Show the students a slidehammer and a mechanical handle that can be attached to a spot welder for dent removal. Also, show them the ground clamp that must be attached to the panel to weld a stud or other device to the panel.

M-7**DEDICATED DENT REMOVAL TOOLS****Demonstration Props**

- Dedicated dent removal tool and accessories

Demonstration

Show the students an example of a dedicated dent removal tool and included accessories. Explain that similar to the spot welder attachments, the machine also requires a ground to be attached to the panel.

N-1**SUCTION TOOLS****Demonstration Props**

- Suction tools

Demonstration

Show the students an example of a suction tool and explain how it is used.

N-3

ADHESIVE TOOLS

Demonstration Prop

- Adhesive dent removal kit

Demonstration

Show the students an adhesive dent removal kit and explain how it is used. Explain that the different size and shape discs are used for different types of damage.

MODULE 3—BODY FILLERS AND SANDING**B-14****STEPPED-OUT BODY FILLER PANEL****Demonstration Prop**

- Stepped-out panel with an area of repaired bare metal, an area with body filler applied, an area with body filler that has been initially sanded with a cheese grater, areas sanded with various grits of sandpaper, an area with polyester glazing putty applied, and an area with sanded polyester glazing putty feathered and ready for primer

Demonstration

Show the students the stepped-out body filler panel and explain what was done in each area. Tell them that the panel was made following the filler maker's recommendation and that different grit sandpaper may be recommended for sanding other brands of body filler.

D-7**MEASURING BODY FILLER****Activity Props**

- Paper
- Pencils
- Stainless steel ice cream scoop
- Ruler

Activity

Have the student draw what they think is an inch and a golf-ball size circle, then measure. These are the measurements they may need to estimate when mixing body filler. A stainless steel ice cream scoop is similar to a golf-ball size amount of body filler.

D-8**MIXING THE CORRECT AMOUNT OF BODY FILLER****Activity Prop**

- Repaired panel that requires body filler

Activity

Give an example of an area that should be filled with body filler. Then give the student several choices of how much filler should be used.

F-3**CHEESE GRATER****Demonstration Props**

- Panel
- Body filler
- Cheese grater

Demonstration

Show the students how to use a cheese grater.

F-4**TYPES OF DA SANDERS****Demonstration Props**

- Weighted round DA sander
- Gear-driven round DA sander
- Rectangular DA sander
- Panel
- Dirt
- Sandpaper for round and rectangular DA sanders

Demonstration

Free rev a weighted and gear-driven round DA sander to show the difference. Show the movement of a round DA versus a rectangular DA. Put a piece of dirt on the sandpaper so that the pattern can be seen on a panel.

F-8**CONTOUR MATCHING SANDING GUIDE****Demonstration Prop**

- Contour matching sanding guide
- Panel to demonstrate how to use

Demonstration

Show the students how a contour matching sanding guide works.

G-1**ABRASIVES****Activity Props**

- Sanding disc and sandpaper with a variety of different grits

Activity

Pass around examples of sanding discs and sandpaper that are not marked. Ask the students to identify the grit of each.

G-8**SANDPAPER BACKING****Demonstration Props**

- Sandpaper with a variety of different backing and paper weight

Demonstration

Show the students examples of different sandpaper backing and the different paper weight ratings.

G-9**SANDPAPER ATTACHMENT METHODS****Demonstration Props**

- Sandpaper with a variety of different attachment methods

Demonstration

Show the students examples of different sandpaper attachment methods.

G-12**WET VS. DRY SANDPAPER****Demonstration Props**

- Wet sandpaper
- Dry sandpaper

Demonstration

Show the students wet and dry sandpaper so that they can compare the differences.

H-6

GUIDE COAT

Demonstration Props

- Guide coat (powder and/or aerosol)
- MSDS for guide coat
- Panel with guide coat applied and partially sanded showing remaining low spots

Demonstration

Show the students an example of a guide coat. Also show the students a panel with guide coat applied and partially sanded. Point out the low spots indicated by the remaining guide coat as well as any highlighted sandscratches. Also, show how the different types of guide coat are used.

MODULE 4–ADDITIONAL REPAIR METHODS

C-3

REPAIRABLE VS. NON-REPAIRABLE

Demonstration Prop

- Panel with PDR repairable and non-repaired damage

Demonstration

Show the students a panel that has some damage that can be removed using PDR and some damage that cannot be removed using PDR. Explain why the non-repairable damage cannot be removed using PDR.

C-4

PDR TOOLS

Demonstration Props

- PDR picks of different lengths and styles

Demonstration

Show the students different types of PDR picks and explain where each may be used. Explain what the different tip styles are used for.

C-5

PDR ACCESSORIES

Demonstration Props

- PDR accessories

Demonstration

Show the students different types of PDR accessories and explain what they are used for.

D-2

LEAD FILLERS

Demonstration Props

- Damaged panel
- Lead filler
- Grinder
- Heat source
- Tinning flux
- Shop rag
- Paddle
- Water to quench
- Body file
- Sandpaper

Demonstration

Show the students lead filler and the tools used to work with lead filler. Show a brief demonstration on how lead filler is used.



Fundamentals Of Collision Repair

Activities And Demonstrations



OPENING THE CLASS

A-4

TRAINING AND RECOGNITION MATERIALS

Demonstration Props

- Sample Certificate
- Gold Class Directories
- Courses & Services Catalog

Demonstration

Use the Courses & Services Catalog and the showcasing I-CAR area to:

- explain the I-CAR Gold Class Professionals program and how to complete the application.
- give an overview of other products and services I-CAR offers.

MODULE 1–VEHICLE CONSTRUCTION AND TERMINOLOGY

A-1

I-CAR RECOMMENDED TRAINING PATHS

Demonstration Prop

- Sample training paths document

Demonstration

Show the students the training paths and explain where this program is positioned in the paths.

B-4

UHSS

Demonstration Prop

- UHSS steel part (Boron)

Demonstration

Show the students a part made of UHSS steel. Explain that it is much stronger than mild steel. Pass the UHSS steel part around the classroom.

BRITTLENESS OF UHSS

Demonstration Props

No props are required for this demonstration.

Demonstration

Show the students the demonstration video. Explain how this shows that UHSS is much more brittle than mild steel. This is one reason why parts made from UHSS are typically replaced when damaged.

B-6**TEMPERATURE INDICATORS****Demonstration Props**

- Steel coupon with heated and unheated lines of thermal paint and a temperature indicating label

Demonstration

Show the students the temperature-indicating label that is attached to the coupon. Explain how each temperature block is designed to change color when the specified temperature is reached. Also, show the students the examples of various types of thermal paint. Explain how these types of paint changed color or melted when the rated temperatures were reached. Pass the temperature indicator prop around the classroom.

B-7**FIBER-REINFORCED COMPOSITE****Demonstration Props**

- Portion of a part made from fiber-reinforced composite (SMC)

Demonstration

Show a piece of fiber-reinforced composite. Point out the fibers that can be seen at the cut locations and the texture on the backside of the part. Pass the part around the classroom.

B-8**PLASTIC REPAIRS****Demonstration Props**

- Plastic with a fusion-type weld
- Plastic with an adhesive-type weld

Demonstration

Show the students a plastic fusion weld. Explain that the weld is made with a rod made of the same type of plastic and that the rod fuses with the plastic being repaired. Also show an adhesion weld. Explain that for this type of weld, the melting rod does not fuse with the plastic but bonds more like an adhesive. Pass the two types of plastic welds around the classroom.

B-11**GALVANIC CORROSION****Demonstration Prop**

- Aluminum panel with galvanic corrosion

Demonstration

Show the students an aluminum panel with galvanic corrosion. Explain that this type of corrosion is caused by direct contact between aluminum and steel with the presence of an electrolyte such as moisture. Pass the aluminum panel around the classroom.

B-12**MAGNESIUM****Demonstration Prop**

- Magnesium part

Demonstration

Show the students a part made of magnesium. Explain that parts are made from magnesium because it is a strong and lightweight material. Pass the magnesium part around the classroom.

C-1**WELD TYPES****Demonstration Props**

- Steel coupons joined by STRSW
- Steel coupons joined by a GMA (MIG) lap weld
- Steel coupons joined by flux-cored arc welding
- Steel coupons joined by MIG brazing

Demonstration

Show the students various types of welds. Explain that there are many types of welds that are used for building and repairing vehicles. Pass the weld samples around the classroom.

C-2**MECHANICAL FASTENERS****Demonstration Props**

- Bolt with protective coating
- Rivet that has not been installed
- Steel coupons secured with a rivet
- Example of a clinch

Demonstration

Show the students samples of mechanical fasteners. Explain that bolts with damaged coatings may require replacement. Also explain how and why some attachment methods may change for vehicle repairs. For example, it may be recommended that clinches be replaced with rivets. Pass the samples around the classroom.

C-3**ADHESIVELY BONDED PIECES****Demonstration Props**

- Sample of adhesively bonded steel coupons with spot welds and a rivet.

Demonstration

Show the students the adhesive bonding prop. Explain to the students that spot welds or rivets are sometimes used with adhesive for vehicle repairs. Pass the adhesive bonding prop around the classroom.

C-4**HYDROFORMED PART****Demonstration Prop**

- Hydroformed part

Demonstration

Show the students a hydroformed part. Explain that the hydroforming process creates a flangeless, one-piece structure. Pass the part around the classroom.

C-5**TAILOR-WELDED BLANK****Demonstration Prop**

No props are required for this demonstration.

Demonstration

Show the students the demonstration photos. Point out the laser weld on the photo on the left. Explain that different strengths or thicknesses of metal are joined at the laser weld. Point out the thickness change on the photo on the right.

C-6**LAMINATED STEEL****Demonstration Props**

- Laminated steel sample

Demonstration

Drop a sample of conventional steel on the floor (UHSS prop). Next, drop a sample of laminated steel on the floor. Explain that the laminated steel is made of two steel sheets with a polymer core. The polymer core absorbs the vibration transferred through the panel, which reduces the noise of the panel to a dull thud. Pass the laminated steel sample around the classroom.

D-3**DETERMINING REPAIR CONSIDERATIONS****Activity Prop**

No props are required for this activity.

Activity

Lead the students through the interactive activity by first clicking on one of the three repair situations. Each situation poses questions and answers regarding the type of material being repaired. Use the buttons located at the bottom of the screen to navigate through the activity.

MODULE 2–COLLISION ENERGY MANAGEMENT

A-5

ENERGY MANAGEMENT FEATURES

Demonstration Props

- Foam tube without holes or a split seam
- Foam tube with holes
- Foam tube with a split seam
- Foam tube with a split seam secured with masking tape
 - black dots are drawn on the tape to represent spot welds

Demonstration

Use the foam tube props to demonstrate how some vehicle designs work to manage collision energy. Begin the demonstration by holding the foam tube without holes for the students to see. Compress the tube to show the entire tube bending evenly. Explain that this would be typical of a rail with no energy management. The entire rail would distort, spreading damage and transferring collision energy deep into the vehicle structure.

Next, perform the same demonstration using the tube with the holes in the sides. Show how the holes act as crush zones. Explain that crush zones cause the end of the rail to deflect, absorb collision energy, protect the occupants, and contain damage to the structure.

Next, perform the demonstration using the foam tube with the split seam. When the tube is compressed, the split area will collapse.

Finally, perform the same demonstration using the foam tube that has masking tape securing a split seam. Explain that the tape act like spot welds and the spaces are crush zones. This demonstrates at least two concepts on:

- the importance of completely closing welded seams on structural parts during repairs.
- increased spacing of welds can create collapse zones. Weld spacing is critical.

A-8**REINFORCEMENTS****Demonstration Prop**

- Portion of a part with multiple reinforcements

Demonstration

Show the student a portion of a part with multiple inner reinforcements. Explain that the purpose of the inner reinforcements is to prevent the part from collapsing into the passenger compartment in the event of a collision. Pass the piece around the classroom.

A-9**IMPORTANCE OF STATIONARY GLASS****Demonstration Props**

- Cardboard box with top and bottom removed
- Lid for the cardboard box

Demonstration

Use a cardboard box with the top and bottom cut out to show how weak the structure is. Place a lid on the box to show how it becomes more rigid. Explain that this is how adhesively bonded glass reinforces a body structure. Another method to demonstrate this is to use a hinged wooden frame with a sheet of clear plastic placed in the center.

A-12**STRUCTURAL FOAM STRENGTH****Demonstration Props**

No props are required for this demonstration.

Demonstration

Show the students the demonstration video. The weight of a full-sized SUV is used to demonstrate the strength difference between rigid and structural foam. Explain to the students the importance of replacing foam properly.

CHOOSING REPLACEMENT FOAM

Activity Props

- Portion of expanded factory foam
- Various types of expanded aftermarket foam

Activity

Pass a portion of factory foam, along with various types of aftermarket foam, around the classroom. Ask the students to choose one of the aftermarket foam examples that most closely matches the appearance and consistency of the factory foam.

MODULE 3–REPAIR ISSUES

B-1

BEND

Demonstration Prop

- Part or coupon with a minor bend

Demonstration

Show the students an example of a minor bend. Explain the characteristics of the damage and why it may be repairable. Pass the bent part around the classroom.

B-2

KINK

Demonstration Prop

- Part or coupon with a severe kink

Demonstration

Show the students an example of a severe kink. Explain the characteristics of the damage and why kinked parts typically require replacement. Pass the kinked part around the classroom.

B-5**WORK HARDENING****Activity Props**

- Small paper clip for each student

Activity

Have students perform the paper clip exercise to demonstrate work hardening. To perform the exercise:

1. Pass out a paper clip to each student.
2. Explain that the paper clip was formed from a straight piece of wire.
3. Explain that the wire was work hardened when it was bent.
4. Have the students try to straighten the paper clip.

During straightening:

- they can only use their hands.
- heat cannot be applied.
- the metal next to the bend will want to flex before the metal in the formed areas will straighten.
- as the students continue to bend and straighten the wire, they are increasing the metal hardness and causing the metal to become more brittle as well.
- if the wire is worked long enough, it will break.

D-1**PART SHAPE CONSIDERATIONS****Demonstration Props**

No props are required for this demonstration.

Demonstration

Show the students the demonstration video. Explain that one of the considerations when deciding whether to repair or replace a structural part is if the damage is in a highly formed area, such as the corners of a part, or in the flat portion of a part. This demonstration illustrates the importance of restoring not only shape, but also the integrity of design to structural parts with highly formed areas.

F-1**PARTIAL REPLACEMENT****Demonstration Prop**

- www.i-car.com (internet connection)
- Demonstration slides (no internet connection)

Demonstration

Show the students where to find the Partial Replacement Recommendations Matrix and how it is used. Explain that this is a valuable tool for determining if a sectioning procedure exists for a vehicle. A link to the vehicle maker service information may be provided if sectioning procedures exist. The demonstration slides provided on the program CD-ROM may be used if there is no internet access.

F-3**DETERMINING PART REPAIRABILITY****Activity Props**

No props are required for this activity.

Activity

Lead the students through the interactive activity by first clicking on one of the three repair situations. Each situation poses questions and answers regarding various types of parts, damage, and repair considerations. Use the buttons located at the bottom of the screen to navigate through the activity.

I. PRELIMINARY INFORMATION:
A. CLASS: Auto Collision Repair
B. TITLE OF UNIT: Non- Structural Repair- Sheet Metal
C. TITLE OF LESSON: Basic Sheet Metal Repair
D. COMPETENCIES ADDRESSED: Understanding metal properties & straightening methods
E. DATE & TIME: 9/29/08 – 10/10/08 AM PM Classes
F. WEEK OF INSTRUCTION: Week 8 and 9
G. INSTRUCTOR: Mike Kuechler
H. ADDITIONAL INFORMATION Junior Repair Panels will be started

II. OBJECTIVES (*obj.* ► *content* ► *assessment = Internal Alignment*):

Psychomotor:

Students will straighten a minor dent in a sheet metal panel using standard hand tools and methods

Cognitive:

Students will understand automotive sheet metal properties and how they apply to the repair plan and procedures

Affective:

Students will understand the relationship between attention to detail and customer satisfaction

III. TEACHING METHODS AND TECHNIQUES:

Illustrated Lecture Demonstration
Supervised Lab Work Question Answer

Other: N/A

IV. RESOURCES REQUIRED:

Text Book DVD
Computer/Computer Projector Handouts

Other: I-Car CD STS-01, undamaged fender for prop, hammers and dollies

V. INTRODUCTION:

Having a fender on a stand and asking for a student volunteer to place one dent with a rubber mallet in the fender simulating their neighbor's kid hit their parent's car with a baseball and now they as promising young body technician's have to repair the damage on their mom or dad's vehicle. Proving that they have learned something at tech school.

VI. CONTENT (*obj. ► content ► assessment = Internal Alignment*):

Types of steel used in todays automobiles

1. Mild or low carbon steel (MS) - used mostly for cosmetic panels - easily repaired if damage is not excessive.
2. High-Strength Steel (HSS) - used for structural components of newer vehicles - most cases HSS can be straightened.
3. Ultra High-Strength Steel (UHSS) lighter weight and stronger than HSS-must be replaced and never repaired.

Use the manufacturer's service manual to help identify where these different types of metals are located on a specific vehicle.

What is Part Loading?

A force which is applied to a part to damage it.

The Five Basic Types of Loads

1. Tension - tries to pull parts straight apart
 2. Compression - forces parts straight into each other
 3. Shear - pulls apart sideways
 4. Cleavage - forces parts apart from an angle
 5. Peel - pulls apart straight away from each other
- During a collision one or more of these types of loads can occur.

Properties of automotive sheet metal and the changes that occur in a collision.

Deformation is the undesired bent shape metal forms after impact and the four ways to measure strength and the metal resistance to deform.

1. Yield Stress - this is the amount of strain needed to permanently deform a test specimen.
 2. Compression Strength - resistance to being crushed.
 3. Shear Strength - measure to withstand forces acting to cut or slice it apart.
 4. Torsional Strength - to withstand a twisting force.
- Strength is expressed in pounds per square inch (psi) or

kilograms per square millimeter (kPa).

When flat metal is formed it takes on certain properties that harden it into shape for strength and cosmetic appearance.

Flat panels if hit lightly will usually bend then return to their original shape, like a roof panel (spring back). But a curved shape when hit lightly will hardly move. This is because of how the grain structure or patterns are lined up in the steel giving it certain properties.

Sheet Metal's Resistance to change has three properties:

1. Elastic Deformation - ability for metal to stretch and return back to its original shape.
2. Plastic Deformation - ability for metal to be bent and formed into different shapes (desirable or undesirable).
3. Work Hardening - to become very hard in the bent area due to plastic deformation being so great (desirable or undesirable). More difficult to repair.

Also sheet metal has a Yield Point which is the amount of force that a piece of metal can resist without tearing or breaking.

Body Damage Classifications.

1. Direct Damage - a tear, gouge, or scratch. Visible very easy to find caused by direct contact with another object during impact.
2. Indirect Damage - a buckle or fold away from the initial impact area causing tension or pressure on the surrounding surfaces. Not as visible or as easy to identify and is due to the collision forces traveling through the sheet metal.
3. Work Hardening - normal and impact created. May decrease the technicians ability to perform repairs without tearing or damaging the metal more.

Pressure and tension are used to describe the conditions of metal after a collision.

The high spot or bump that sticks up higher than the surrounding area causes pressure on the metal surface. The low spot or dent that is recessed below the surrounding area causes tension on the metal surface.

Removing these pressure and tension forces is what we do when we straighten the metal with our hammer and dollies.

Understanding how to raise a low spot or lower a high spot in the straightening process is important to proper repair procedures and eliminating extra work

or repair materials needed.

Metal Straightening Techniques

First analyze the damage to be repaired.

Determine the direction of impact

Imagine the damage in reverse order as you visualize how the repair will be made

Plan how and with what tools or equipment you will begin to make the repair on the damage

Begin the repair work by roughing out the metal removing most of the obvious damage, it is important to do this step properly before any finish operations are started or undesirable results may result

A good rule of thumb is "First damage in, last damage out" or work indirect damage first, and work direct damage last".

Hammers and Dollies

Many varieties of body hammers, most common are;

Heavy Body Hammers-used for rough-out

Finishing Hammers-smooth face to finish the rough-out work to prepare for grinding and filling

A dolly is a heavy piece of metal used to back up the hammer blows. These also come in many shapes and sizes.

Practice good hammer and dolly methods

Success depends on well place hammer blows starting with light rapid taps. Monitoring your progress as you remove the damage and try not to over hammer the area which will only make the metal thinner and weaker.

Hammer-off-Dolly Method -

This method is used to raise low spots and lower high spots, using the dolly behind the low spots and the hammer to tap down the high spots.

Often is used to rough out or shape areas of damage
Maintain control by altering how hard you hit the panel, the amount of force used with dolly from the back side of dent, and how far away you have the dolly from the hammer blows.

Hammer-on-dolly Method

This method is used for final smoothing out of the damage.

The dolly is held directly behind the metal where the hammer blows will be made.

This causes a pinching action and irons out minor imperfections made by the rough-out process. Control can be maintained in the same manner as with the hammer-off-dolly method

VII. SUMMARY:

Learning and practicing good hammer and dolly techniques will greatly improve the quality of your bodywork which will be a direct reflection on your desire towards customer satisfaction. Your ability to reshape a deformed body panel making it look new again without a lot of body filler will show that you are conscientious about your work.

VIII. ASSESSMENT (*obj. ► content ► assessment = Internal Alignment*):

Psychomotor:

After practicing on a class panel the student will have their own panel that will be predamaged. They will have to straighten this panel using the methods and techniques learned in this lesson. Preparing it smooth enough for the grinding and filler application step.

Cognitive:

Students will take a written exam to show basic understanding of the properties of different types of metals used today. Also a knowledge of the basic hand tools, their uses and how to work out the damage utilizing them will be assessed.

Affective:

Students should understand that quality is about pride in your work and what you do. They should relate quality with the ability of holding on to a good paying career for years to come.

IX. ASSIGNMENTS (*reinforce major lesson components*):

(select)	(type text here...)
(select)	(type text here...)
(select)	(type text here...)

X. RELEVANCE TO FUTURE LESSONS:

Sheet metal repair using hammer and dolly methods is only the beginning. Many other tools and ways to straighten sheet metal will be discussed later in the program. This is just the start for our next lesson on plastic filler repair where we will learn and practice preparing the sheet metal for plastic body filler and finishing off the filler making it ready for the primer/filler application.

XI. LESSON/COURSE EVALUATION:

(Which part of this lesson worked? What didn't? How can we improve this lesson, unit, course? Make notes now to initiate the evaluation/improvement process...)

I. PRELIMINARY INFORMATION:
A. CLASS:Auto Collision Repair
B. TITLE OF UNIT:Personal Safety
C. TITLE OF LESSON:Respiratoy Protection
D. COMPETENCIES ADDRESSED:Safety in the Workplace
E. DATE & TIME:11/13/08 – 11/13/08 AM PM Classes
F. WEEK OF INSTRUCTION:Week 4 and 5
G. INSTRUCTOR:Mike Kuechler
H. ADDITIONAL INFORMATIONPresented within the safety program

II. OBJECTIVES (*obj. ► content ► assessment = Internal Alignment*):

Psychomotor:

Students will choose the correct type respirator for the situation and perform a seal check

Cognitive:

Students will understand the difference between the two types of respirators and their uses, the importance of a proper fit and maintaining cartridge respirators for maximum effectiveness.

Affective:

Students will understand the relationship between wearing (or not wearing) proper respiratory protection equipment and health problems that can occur over the long term.

III. TEACHING METHODS AND TECHNIQUES:

Illustrated Lecture Demonstration

Visual Illustration

Other: teacher prepared notes and handouts

IV. RESOURCES REQUIRED:

Outside Reference Materials Handouts
Computer/Computer Projector

Other: I-CAR CD WKR-01, examples of respirators, two clear containers, one with plastic dust and the other with thinner vapors.

V. INTRODUCTION:

When I worked in the shop occasionally customers would come in and immediately ask "how can you stand that smell all day long" I would reply "what smell?" yea I couldn't smell a thing, that's because I became desensitized to all those dust and fumes I was breathing in everyday while working in the shop. You just get use to working in that kind of environment. Let me show what the average technician is exposed to eight hours a day, five days a week, fifty two weeks a year for how ever many years he works in the trade. (pass around to the class the containers with plastic filler dust and thinner vapors.) This is what you should be concerned with and how you can decrease your daily exposure to these dangers that will ultimately affect your health if you don't. Let's discuss some of the ways you can protect yourself.

VI. CONTENT (*obj. ► content ► assessment = Internal Alignment*):

Although there are four types of respirators mainly used in auto collision, dust, catridge, welding and fresh air supply we will be learning about just the dust and cartrige type today.

1. Dust Respirator - a paper or cloth filter that fits over your nose and mouth to block small airborne particles. This type will protect you from sanding or grinding dust particles entering you nose, throat or lungs which could cause bronchial irritation and possibly long term lung damage. These type filters will offer no protection from vapors or paint mists and should only be used for dust.
2. Cartridge Respirator - consists of a rubber face piece that conforms to the contour of your face to form an airtight seal. They have intake and exhaust valves that ensure air flows through the filters. They come in several sizes, small, medium and large and have replaceable prefilters and charcoal or carbon cartridge filters. This type will protect you from vapors and spray mists of one-part enamels, lacquers and other nonisocyanate materials and should only be used in well ventilated areas. These need to be NIOSH (National Institute for Occupational Safety and Health) approved to be

compliant with OSHA regulations.

Proper Maintenance of the respirators

1. Paper or cloth filter respirators
 - a. needs no required maintenance.
 - b. should be stored in a plastic type sandwich bag when not in use just to keep mask clean.
 - c. these are disposable mask so when it becomes difficult to breath or the elastic straps break dispose of the mask and replace it with a new one.

2. Cartridge type respirators
 - a. These do require a limited amount of maintenance
 - b. Should be stored in an air tight bag to maximize the life of the charcoal filters as moisture will shorten their life. Also keep away from extreme temperatures and humidity.
 - c. Paper prefilters will become filled with particulates and should be periodically checked and replaced when needed.
 - d. Rubber face mask will become contaminated with sweat, dust and overspray and should be occasionally cleaned in warm soapy water, rinsed and dried thoroughly. Both prefilters and cartridge filters should be removed before cleaning so as not to get them wet. After assembly replace back into an air tight container again.
 - e. A good habit to get into is mark the date you put the respirator into service. Depending on daily use and returning to a sealed air tight container you should expect at least six months of service or longer from a well maintained respirator.
 - f. If you begin to smell fumes or vapors and you know you have a tight seal around your face then this is an indication that it is time to change your respirator out for a new one.

Donning respirator for a proper fit

1. Paper or cloth filter respirator
 - a. Have two elastic bands attached to the respirator itself with staples
 - b. Filter itself has a small metal strip at the top of the nose piece
 - c. Both straps should be put over your head, bottom strap fits around the back of your neck and the other around the back of your head just above the ear. These straps are non-adjustable.

- d. The mask itself should fit firmly over your nose and mouth, the metal strip on the nose piece allows for a tighter fit by bending it to fit the contour of the bridge of the nose.
 - f. Facial hair can interfere with the proper fitting of this respirator and will limit its effectiveness.
2. Cartridge type respirators
- a. Have two adjustable elastic straps attached by looping them through the rubber face mask.
 - b. A rubber face piece that is soft enough to conform around your nose and mouth.
 - c. The upper strap has a head band or cradle that fits on the top of the technicians head.
 - d. The bottom strap has a quick release type latch that fits around the back of the neck.
 - e. Once donned the fit can be adjusted by means of the two straps, first pull the slack out of the top strap making it fit firmly, then tighten the straps at the back of the neck making sure the entire mask fits snug but comfortable against the face.
 - f. Facial hair can interfere with this mask as well and the technician should be clean shaven before using this type mask. A tight fit must be present in order for the mask to prevent vapor and fumes from entering the technicians lungs. Most employers insist on this for continued employment.

Checking for a proper fit

- 1. Paper or cloth filter respirator
 - a. Check for a snug fit around nose and face, the only adjustment that can be made is by moving the mask around the face or bending the nose piece.
 - b. Should be no dust entering in from around the mask.
 - c. Will not prevent vapors or fumes from being detected.
- 2. Cartridge type respirator
 - a. After donned properly a seal check can be performed.
 - b. You can check for both a positive and negative seal.
 - c. Check for a positive seal by placing your palm over the exhaust port located in front of the respirator and exhale. If the seal is tight you should not be able to exhale, if you can then you need to adjust the straps for a tighter fit.

- d. Check for a negative seal by covering both cartridge filters with your palms and breath in. If you have a proper seal the mask will collapse inwards towards your face, if not then you need to adjust the straps for a tighter fit.
- e. The technician should perform the seal check each and every time he/she puts on the respirator.

VII. SUMMARY:

A technician should protect themselves from the many airborne dangers present in the every day enviroment of the collision repair shop. Knowing what kind of respirator to use and how to use them properly will reduce your exposure to dusts, fumes, vapors and spray mists you will be surrounded by day in and day out.

VIII. ASSESSMENT (*obj. ► content ► assessment = Internal Alignment*):

Psychomotor:

Students will donn both type respirators properly and do a seal check on the cartridge type respirator. They will perform both a positive and negative test and will adjust if needed.

Cognitive:

Students will take a written safety test on respirators to show understanding of the different types and their uses, limitations and maintenance requirements.

Affective:

Students will know that they can have a direct affect on their long term health by using respirators properly and when needed.

IX. ASSIGNMENTS (*reinforce major lesson components*):

Group Activities:	Plasic Filler Repair
Group Activities:	Sanding and Refinishing

(select)

(type text here...)

X. RELEVANCE TO FUTURE LESSONS:

(tie to future lessons, courses, levels, etc. = Internal Alignment)

XI. LESSON/COURSE EVALUATION:

(Which part of this lesson worked? What didn't? How can we improve this lesson, unit, course? Make notes now to initiate the evaluation/improvement process...)

**MODULE ONE: INTRODUCTION TO AUTO COLLISION
TECHNOLOGY****S 139****UNIT VII: DAMAGE REPORT PRINCIPLES****UNIT OBJECTIVE**

Upon completion of this unit, the student should be able to write a damage report in logical sequence. Mastery will be evidenced through demonstration and by scoring _____ on the unit test.

SPECIFIC OBJECTIVES

Upon completion of the lessons in this unit, the student should be able to:

Lesson 1:

- I. Identify principles of damage reports (Competencies E1, E2, E3, Unit VII test).
- II. Identify principles of writing a damage report (Competencies E1, E2, E3, Unit VII test).
- III. Identify principles of using collision manuals (Competencies E1, E2, E3, Unit VII test).
- IV. Demonstrate the ability to:
 - a. Diagnose and analyze auto collision damage (Competencies E1, E2, E3, Assignment Sheet #1).

**MODULE ONE: INTRODUCTION TO AUTO COLLISION
TECHNOLOGY****S 141****UNIT VII: DAMAGE REPORT PRINCIPLES****CONTENTS OF THIS UNIT**

- A. Objective sheet
- B. Contents of this unit
- C. Notes to the instructor
- D. Lesson plans
 - 1. Lesson 1: Analyze Damage and Write a Damage Report
 - a. Information outline
 - b. Handouts
 - HO#1: Collision manual page
 - HO#2: Damage report form
 - c. Assignment sheets
 - AS#1: Diagnose and analyze damage
- E. Unit test
- F. Answers to unit test

NOTES TO THE INSTRUCTOR

- A. Demonstrate the use of the zone system, or a comparable system, for analyzing collision damage.
- B. Show students examples of damage reports.
- C. Each student should use the assignment sheet in this unit to evaluate the damage to each vehicle brought into the shop. As the student nears the end of the complete auto collision program, the assignment sheets should be used to evaluate competencies E1, E2 and E3.

**MODULE ONE: INTRODUCTION TO AUTO COLLISION
TECHNOLOGY****S 143****UNIT VII: DAMAGE REPORT PRINCIPLES****LESSON ONE: ANALYZE DAMAGE AND WRITE A DAMAGE REPORT**

- I. Principles of writing damage reports
 - A. It is very important to be able to examine a damaged vehicle accurately, determine the extent of damage, explain what must be repaired and how much it will cost, and then be able to competently fix all the damage at a competitive price.
 - B. The auto collision repair business is highly competitive and in order to gain work, the shop must be able to tell customers, in most cases, exactly how much it will cost to fix their vehicles.
 - C. In addition to writing a professional damage report, customers need to feel confident in the shops ability to do the job and the quality of work in order to make the repair sale.
 - D. Although there are times when supplemental reports will need to be written, an auto collision shop's initial report must be reasonably accurate and reasonably priced.
 - E. Some insurance companies employ their own adjusters and/or estimators who also examine vehicles and give their own damage reports or make adjustments in the shop's estimate.
 - F. There are three important factors in estimating damage.
 - 1. Understanding vehicle construction.
 - 2. Understanding primary and secondary damage.
 - 3. Understanding collision manuals.
 - G. Vehicle construction
 - 1. The construction of vehicles varies widely with the make and model of the vehicle.
 - 2. Although some components are common to all vehicles, there are many components which are made in very different ways. This is particularly true of body panels, which will always be involved in collision repair.

- C. The written damage report is considered by the insurance company to be a firm statement of what the job requires and at what price.
- D. An important part of making an estimate on a vehicle with extensive damage is to determine if the vehicle can be economically repaired.
- E. There are occasions when recycled parts may be utilized. In writing a damage report with recycled parts, the estimator must know if parts are available and what the cost will be.
- F. There are three steps in writing a damage report. Refer to the sample at the end of this lesson.
 - 1. Analyzing damage.
 - 2. Using collision manuals.
 - 3. Writing a damage report in a logical sequence.
- G. Analyzing damage
 - 1. Damage should be analyzed by dividing the vehicle into five zones.
 - 2. Items within the five zones are listed on a checksheet and should be analyzed in that order.
- H. The five zones
 - 1. **Primary damage** — Panels and other major components damaged from direct contact.
 - 2. **Secondary damage** — Damage which is caused by the force of the collision as it moves through the vehicle. Secondary damage is not always easily detected.
 - 3. **Mechanical components** — Damage to the engine, transmission, and suspension.
 - 4. **Passenger compartment** — Damage to components and interior trim inside the passenger area.
 - 5. **Exterior trim and finish** — Damage to trim , moldings, body accessories, and finish.



6. Record secondary damage to structural panels.
7. Record other damaged components.
8. Record mechanical components damaged.
9. Record passenger compartment components damaged.
10. Record trim components damaged.
11. Although the above is used for analyzing damage, follow the front-to-back procedure of collision manuals in writing a damage report.

L. Notes on analyzing damage

1. The purpose of any damage analysis system is to keep you from overlooking damage. Don't worry about whether a borderline item should be considered primary or secondary damage, just be sure it is recorded as damage so the analysis and resulting estimate will be accurate.
2. Some parts are listed in more than one zone. They should be addressed at the time they are first noted.
3. As you check the vehicle over, remember to watch for the following:
 - a. Broken welds
 - b. Paint stress
 - c. Damaged seam sealer
 - d. Damaged suspension mounts
 - e. Body dimensions out of tolerance

III. Collision manuals

- A. Collision manuals are available from several sources. Please refer to the collision manual example page at the end of this lesson.
- B. When doing a damage report, be aware of price changes. Use the latest manual available.
- C. Multiply the hours estimated to do the job by your shop's labor rate.
- D. The hours given for each job are estimates and must be modified due to extenuating circumstances, such as the need to cut away severely



5. In addition to the cost of parts and labor, sales tax must be calculated.
6. Make sure all information on the customer is filled out at the top of the form and make sure a copy of the damage report is kept on file so it can be referred to if your shop gets the job. Also, make sure all information on vehicle type, style, etc., and all information on parts (color, special trim, etc.) is recorded.
7. Many shops are furnished with computer estimate programs.

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**MODULE ONE: INTRODUCTION TO AUTO COLLISION
TECHNOLOGY****T 37****UNIT VII: DAMAGE REPORT PRINCIPLES****UNIT VII TEST**

I. Select the best answer from the choices listed.

- _____ 1. Estimator I says that writing a damage report is not particularly important since the insurance company will write its own.

Estimator II says that a damage report will always need adjustments as the vehicle is actually fixed and you don't need to worry about leaving an item off of the estimate.

Who is right?

- a. I only
b. II only
c. Both I and II
d. Neither I nor II
- _____ 2. Estimator I says that secondary damage is damage that was caused as a result of primary damage.

Estimator II says that secondary damage is damage that was a result of the vehicle being towed into the shop.

Who is right?

- a. I only
b. II only
c. Both I and II
d. Neither I nor II
- _____ 3. Estimator I says that overlap time is a result of one technician performing the same operation as another technician.

Estimator II says that figures for overlap time can usually be found in the collision manual.

Who is right?

- a. I only
b. II only
c. Both I and II
d. Neither I nor II

**Number of
correct
answers
on this page**

- _____ 8. How many hours should it take to remove and install a backglass on a sedan?
- a. 2.4
 - b. 2.2
 - c. 2.7
 - d. 2.0
- _____ 9. How long should it take to remove and install the left lower molding on the exterior trim?
- a. 1.0
 - b. .2
 - c. .3
 - d. .5
- _____ 10. How many hours should it take to section both quarter panels and remove and replace the rear body panel including remove and replace the quarter glass?
- a. 26.7
 - b. 29.2
 - c. 25
 - d. 27.5
- _____ 11. What is the part number of the fuel door without remote release on a wagon?
- a. F2DZ 74405A26 B
 - b. F2DZ 74405A26 A
 - c. F4DZ 54405A26 A
 - d. F4DZ 54405A26 B
- _____ 12. What is the Ford part number for a 1993 heated back window glass on a sedan?
- a. DB08223 GTY
 - b. F4DZ 5442006A
 - c. F2DZ 5442006 A
 - d. DB08715 GTY
- _____ 13. What is the cost of the fuel door release latch on a wagon?
- a. \$36.68
 - b. \$42.53
 - c. \$38.02
 - d. \$37.20

**Number of
correct
answers
on this page**

TAURUS 1992-95

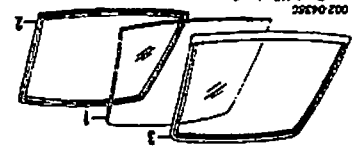
SUNROOF CONT'

5	Shield, Sunroof Opening	89.95	F02 545098 A
6	Weatherstrip	30.45	F02 545092 A
7	Rail, Sunroof Assy	122.22	F02 545070 A
8	Support, Air Deflector	18.25	F02 545068 A
9	Deflector, Air	83.35	F02 545066 A

Use Procedure Explanation 19 with the following text.

SEDAN

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R&R Back Glass. Includes Clean Up Old Adhesive as Necessary.

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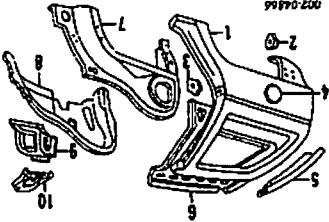
QUARTER PANEL

Use Procedure Explanations 20 and 28 with the following text.

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SHEET METAL WAGON

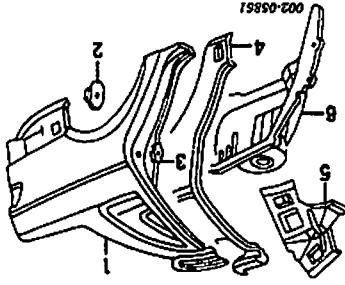
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Horizontal cut through Quarter Window Opening & R&R Rear Body Panel.
 Section Both Quarter Panels & R&R Rear Body Panel.
 Add to R&R or Section Quarter Panel To Drill Holes for Installation.
 Opening, Includes R&R Quarter Panel.
 To R&R Quarter Class.
 Wagon.
 To R&R Back Glass.

SEDAN

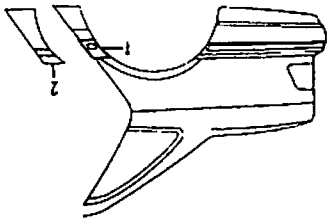
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Product & without Removal, Deduction Includes Common Surfaces & Included Operations.
 2 Right, Rear Door Latch.
 3 Plate, Striker.
 4 Door, Fuel.
 5 Panel, Outer Quarter.
 6 Panel, Inner Quarter.
 7 Wheelhouse, Outer.
 8 Wheelhouse, Inner.
 9 Rakt, HalfWhitso.
 10 Member, Shock Ring.

EXTERIOR TRIM

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Includes R&R Package Tray, Rear Seal, High Mount Stop Lamp, Quarter Upper Trim Panels & Luggage Lid Hinges.
 1 Mounting, Slide Adhesive Type Sedan.
 2 RAIL Lwr Body.
 3 Plate, Striker.
 4 Door, Fuel.
 5 Panel, Outer Quarter.
 6 Panel, Inner Quarter.
 7 Wheelhouse, Outer.
 8 Wheelhouse, Inner.
 9 Rakt, HalfWhitso.
 10 Member, Shock Ring.

ANSWERS TO UNIT VII TEST

1. D
2. A
3. B
4. B
5. C
6. A
7. B
8. C
9. B
10. D
11. A
12. B
13. D
14. B

**MODULE ONE: INTRODUCTION TO AUTO COLLISION
TECHNOLOGY****S 139****UNIT VII: DAMAGE REPORT PRINCIPLES****UNIT OBJECTIVE**

Upon completion of this unit, the student should be able to write a damage report in logical sequence. Mastery will be evidenced through demonstration and by scoring _____ on the unit test.

SPECIFIC OBJECTIVES

Upon completion of the lessons in this unit, the student should be able to:

Lesson 1:

- I. Identify principles of damage reports (Competencies E1, E2, E3, Unit VII test).
- II. Identify principles of writing a damage report (Competencies E1, E2, E3, Unit VII test).
- III. Identify principles of using collision manuals (Competencies E1, E2, E3, Unit VII test).
- IV. Demonstrate the ability to:
 - a. Diagnose and analyze auto collision damage (Competencies E1, E2, E3, Assignment Sheet #1).



**MODULE ONE: INTRODUCTION TO AUTO COLLISION
TECHNOLOGY****S 141****UNIT VII: DAMAGE REPORT PRINCIPLES****CONTENTS OF THIS UNIT**

- A. Objective sheet
- B. Contents of this unit
- C. Notes to the instructor
- D. Lesson plans
 - 1. Lesson 1: Analyze Damage and Write a Damage Report
 - a. Information outline
 - b. Handouts
 - HO#1: Collision manual page
 - HO#2: Damage report form
 - c. Assignment sheets
 - AS#1: Diagnose and analyze damage
- E. Unit test
- F. Answers to unit test

NOTES TO THE INSTRUCTOR

- A. Demonstrate the use of the zone system, or a comparable system, for analyzing collision damage.
- B. Show students examples of damage reports.
- C. Each student should use the assignment sheet in this unit to evaluate the damage to each vehicle brought into the shop. As the student nears the end of the complete auto collision program, the assignment sheets should be used to evaluate competencies E1, E2 and E3.



**MODULE ONE: INTRODUCTION TO AUTO COLLISION
TECHNOLOGY****S 143****UNIT VII: DAMAGE REPORT PRINCIPLES****LESSON ONE: ANALYZE DAMAGE AND WRITE A DAMAGE REPORT**

- I. Principles of writing damage reports
 - A. It is very important to be able to examine a damaged vehicle accurately, determine the extent of damage, explain what must be repaired and how much it will cost, and then be able to competently fix all the damage at a competitive price.
 - B. The auto collision repair business is highly competitive and in order to gain work, the shop must be able to tell customers, in most cases, exactly how much it will cost to fix their vehicles.
 - C. In addition to writing a professional damage report, customers need to feel confident in the shop's ability to do the job and the quality of work in order to make the repair sale.
 - D. Although there are times when supplemental reports will need to be written, an auto collision shop's initial report must be reasonably accurate and reasonably priced.
 - E. Some insurance companies employ their own adjusters and/or estimators who also examine vehicles and give their own damage reports or make adjustments in the shop's estimate.
 - F. There are three important factors in estimating damage.
 - 1. Understanding vehicle construction.
 - 2. Understanding primary and secondary damage.
 - 3. Understanding collision manuals.
 - G. Vehicle construction
 - 1. The construction of vehicles varies widely with the make and model of the vehicle.
 - 2. Although some components are common to all vehicles, there are many components which are made in very different ways. This is particularly true of body panels, which will always be involved in collision repair.

3. In estimating repair costs, the estimator must know what panels that can be seen are damaged and also what hidden panels are likely to be damaged.

H. Primary and secondary damage

1. In every collision, there is primary damage.
 - a. Primary damage results from the direct impact of the collision. Areas of primary damage came into contact with what the vehicle struck.
 - b. Primary damage is almost always obvious.
2. In most collisions, there is secondary damage in addition to primary damage.
 - a. Secondary damage results from primary damage.
 - b. As the panels and components damaged by primary damage buckle, tear, or break, the stresses the primary damage causes to the vehicle may cause extensive secondary damage.
 - c. Secondary damage may not be evident without a close inspection.

I. Collision manuals

1. Collision manuals show the location of vehicle parts, the cost of replacement parts, and the estimated installation or repair time.
2. In using collision manuals, one important consideration is to figure overlap time in calculating the time needed to make repairs. For example, the collision manual may show a time of 3.5 hours needed to remove and replace a front fascia assembly, and a time of 1.5 hours to replace the bumper. But, if both are being repaired, there will be a savings of time because the estimate for removing and replacing the front fascia also includes the time needed to remove and replace the bumper.

II. The written report

- A. The written report should be made in a logical sequence, following the format of collision manuals. Establishing a systematic process will eliminate overlooking or duplicating parts.
- B. Items to be listed include all damaged parts, the cost of replacement parts, labor, materials, and such things as whether new or used parts will be used and whether an item will be sublet.

- C. The written damage report is considered by the insurance company to be a firm statement of what the job requires and at what price.
- D. An important part of making an estimate on a vehicle with extensive damage is to determine if the vehicle can be economically repaired.
- E. There are occasions when recycled parts may be utilized. In writing a damage report with recycled parts, the estimator must know if parts are available and what the cost will be.
- F. There are three steps in writing a damage report. Refer to the sample at the end of this lesson.
 - 1. Analyzing damage.
 - 2. Using collision manuals.
 - 3. Writing a damage report in a logical sequence.
- G. Analyzing damage
 - 1. Damage should be analyzed by dividing the vehicle into five zones.
 - 2. Items within the five zones are listed on a checksheet and should be analyzed in that order.
- H. The five zones
 - 1. **Primary damage** — Panels and other major components damaged from direct contact.
 - 2. **Secondary damage** — Damage which is caused by the force of the collision as it moves through the vehicle. Secondary damage is not always easily detected.
 - 3. **Mechanical components** — Damage to the engine, transmission, and suspension.
 - 4. **Passenger compartment** — Damage to components and interior trim inside the passenger area.
 - 5. **Exterior trim and finish** — Damage to trim, moldings, body accessories, and finish.



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I. Equipment needed to analyze collision damage

1. Equipment to raise vehicle for underbody inspection

(CAUTION: Do not attempt to lift a vehicle for analyzing damage until you have been properly instructed in lifting, jacking, and supporting techniques.)

2. Tram gauge, steel tape, and common hand tools
3. Manufacturer's parts list and vehicle dimension specifications
4. Equipment to perform steering and suspension quick checks

(NOTE: This information will be discussed in detail in Module 7 "Frame-Body and Unibody Construction and Repair".)

J. Additional checks

1. When measuring dimensions for unibody vehicles remember that a tolerance of three mm is the maximum allowed.
2. As you make checks, be sure to note whether repair or replacement will be necessary, and be sure to list refinishing procedures needed.
3. Start engine, if possible, and observe components for proper conditions.
4. Operate anything that opens, closes, turns, or moves in any way. Check opening gap size on hood, door, and luggage lid openings.
5. Don't inflict additional injury to the vehicle while checking it over.

K. General sequence of analyzing damage

1. Start with major cosmetic panels in the primary damage area that must be repaired or replaced.
2. Record all other cosmetic panels in the primary damage area, such as inner cosmetic panels.
3. Record any damage to structural panels.
4. Record other primary damage.
5. Record cosmetic panels with secondary damage.

6. Record secondary damage to structural panels.
7. Record other damaged components.
8. Record mechanical components damaged.
9. Record passenger compartment components damaged.
10. Record trim components damaged.
11. Although the above is used for analyzing damage, follow the front-to-back procedure of collision manuals in writing a damage report.

L. Notes on analyzing damage

1. The purpose of any damage analysis system is to keep you from overlooking damage. Don't worry about whether a borderline item should be considered primary or secondary damage, just be sure it is recorded as damage so the analysis and resulting estimate will be accurate.
2. Some parts are listed in more than one zone. They should be addressed at the time they are first noted.
3. As you check the vehicle over, remember to watch for the following:
 - a. Broken welds
 - b. Paint stress
 - c. Damaged seam sealer
 - d. Damaged suspension mounts
 - e. Body dimensions out of tolerance

III. Collision manuals

- A. Collision manuals are available from several sources. Please refer to the collision manual example page at the end of this lesson.
- B. When doing a damage report, be aware of price changes. Use the latest manual available.
- C. Multiply the hours estimated to do the job by your shop's labor rate.
- D. The hours given for each job are estimates and must be modified due to extenuating circumstances, such as the need to cut away severely



damaged sheet metal which is in the way of performing a repair operation.

BACK WINDOW
Use Procedure Explanation 19 with the following text.

SEDAN

R&I Back Glass #2.7
#Includes Clean Up Old Adhesive as Necessary

NOTES ON ADJUSTING LABOR HOURS —

PANEL DESCRIPTION —

PANEL LOCATIONS —

PART NUMBER —

LABOR HOURS TO REPLACE —

COST OF NEW PART —

002 04380					
1. Glass, Back Window					
Ford					
Heated	92		F4DZ 5442006 A	#2.2	1505.05
	93-94		F4DZ 5442006 A	#2.2	1505.05
	95		F5DZ 5442006 A	#2.2	1589.68
Non-Heated	92-93		F2DZ 5442006 A	#2.2	1068.09
	94-95		F4DZ 5442006 B	#2.2	1068.09
NAGS-Green					
Heated					
1992	all		DB08010GTY	#2.2	1505.05
1993-94					
w.Attach	all		DB08223GTY	#2.2	1505.05

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E. Writing the damage report

1. A damage report should be written in a logical sequence, following the collision manual format.
2. In writing the damage report, be sure to record whether the part must be repaired or replaced. You will need to depend on skill and experience in deciding if a panel should be repaired or replaced.
3. In totaling the damage report, be sure all figures are accurate and be sure you haven't overlooked anything.
4. If damage is discovered that was left out of the damage report, the customer or the insurance company (whoever is paying) must be told immediately, before the work is done and a supplement report filed. A settlement will have to be reached with either the customer or the insurance company before the newly discovered damage can be repaired.

5. In addition to the cost of parts and labor, sales tax must be calculated.
6. Make sure all information on the customer is filled out at the top of the form and make sure a copy of the damage report is kept on file so it can be referred to if your shop gets the job. Also, make sure all information on vehicle type, style, etc., and all information on parts (color, special trim, etc.) is recorded.
7. Many shops are furnished with computer estimate programs.

SUNROOF CONT'

5	Shield, Sunroof Opening	88.95	F02 54938 A
6	Weatherstrips	30.43	F52 43921 A
7	Rail, Sunroof Assy	18.23	F02 54920 A
8	Support, Air Deflector	18.23	F02 54928 A
9	Deflector, Air	83.33	E02 54909 A

BACK WINDOW

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

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2	2 Rein, Rear Door Latch	18.25	F02 54948 A

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2	2 Rein, Rear Door Latch	18.25	F02 54948 A

SHEET METAL

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

1	1 Panel, Outer Quarter	115.30	F02 54781 A
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1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

QUARTER PANEL

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

EXTERIOR TRIM

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

REPAIR

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

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2	2 Rein, Rear Door Latch	18.25	F02 54948 A

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

LABOR

1	1 Panel, Outer Quarter	115.30	F02 54781 A
2	2 Rein, Rear Door Latch	18.25	F02 54948 A

1	1 Panel, Outer Quarter	115.30	F02 54781 A
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INTRO 217

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UNIT VII: DAMAGE REPORT PRINCIPLES**W 17****LESSON ONE, ASSIGNMENT SHEET #1****ANALYZE DAMAGE****INSTRUCTIONS FOR STUDENT**

1. Your instructor will direct you to use this form to diagnose and analyze damage to a vehicle brought into the shop.
2. Using a collision manual to assist you in locating panels, and the zone system checklist (or comparable system), record the damage on the form below. Use a checkmark to show whether the item will be repaired or replaced.

DAMAGED ITEM	DESCRIPTION OF DAMAGE	REPAIR	REPLACE

**MODULE ONE: INTRODUCTION TO AUTO COLLISION
TECHNOLOGY****T 37****UNIT VII: DAMAGE REPORT PRINCIPLES****UNIT VII TEST**

I. Select the best answer from the choices listed.

- _____ 1. Estimator I says that writing a damage report is not particularly important since the insurance company will write its own.

Estimator II says that a damage report will always need adjustments as the vehicle is actually fixed and you don't need to worry about leaving an item off of the estimate.

Who is right?

- a. I only
b. II only
c. Both I and II
d. Neither I nor II
- _____ 2. Estimator I says that secondary damage is damage that was caused as a result of primary damage.

Estimator II says that secondary damage is damage that was a result of the vehicle being towed into the shop.

Who is right?

- a. I only
b. II only
c. Both I and II
d. Neither I nor II
- _____ 3. Estimator I says that overlap time is a result of one technician performing the same operation as another technician.

Estimator II says that figures for overlap time can usually be found in the collision manual.

Who is right?

- a. I only
b. II only
c. Both I and II
d. Neither I nor II

**Number of
correct
answers
on this page**

- _____ 4. Estimator I says that if the cost of repairing the vehicle with new parts exceeds the value of the vehicle, the estimator should not waste time with writing a damage report.

Estimator II says that if the cost of repairing the vehicle with new parts exceeds the value of the vehicle, the estimator should consider writing a damage report to repair the vehicle with recycled parts.

Who is right?

- a. I only
- b. II only
- c. Both I and II
- d. Neither I nor II

- _____ 5. Estimator I says that the written estimate should be made in a sequence that follows the format of collision manuals.

Estimator II says that the damage should be analyzed by dividing the vehicle into five zones.

Who is right?

- a. I only
- b. II only
- c. Both I and II
- d. Neither I nor II

II. Refer to the sample page of the collision manual to answer the following questions. Select the best answer from the choices given.

- _____ 6. How many hours should it take to refinish an outside quarter panel on a sedan?

- a. 2.2
- b. 2.4
- c. 2.7
- d. 2.9

- _____ 7. How many hours should it take to remove and replace both quarter panels on a sedan and you have to drill holes for two moldings?

- a. 26.7
- b. 27.1
- c. 31.3
- d. 29.2

**Number of
correct
answers
on this page**

- _____ 8. How many hours should it take to remove and install a backglass on a sedan?
- a. 2.4
 - b. 2.2
 - c. 2.7
 - d. 2.0
- _____ 9. How long should it take to remove and install the left lower molding on the exterior trim?
- a. 1.0
 - b. .2
 - c. .3
 - d. .5
- _____ 10. How many hours should it take to section both quarter panels and remove and replace the rear body panel including remove and replace the quarter glass?
- a. 26.7
 - b. 29.2
 - c. 25
 - d. 27.5
- _____ 11. What is the part number of the fuel door without remote release on a wagon?
- a. F2DZ 74405A26 B
 - b. F2DZ 74405A26 A
 - c. F4DZ 54405A26 A
 - d. F4DZ 54405A26 B
- _____ 12. What is the Ford part number for a 1993 heated back window glass on a sedan?
- a. DB08223 GTY
 - b. F4DZ 5442006A
 - c. F2DZ 5442006 A
 - d. DB08715 GTY
- _____ 13. What is the cost of the fuel door release latch on a wagon?
- a. \$36.68
 - b. \$42.53
 - c. \$38.02
 - d. \$37.20

**Number of
correct
answers
on this page**

Auto Collision Technology

- _____ 14. If you shops labor rate is \$30.00 per hour and it takes 2.2 hours to complete a repair, what will be the labor charges?
- a. \$60.00
 - b. \$66.00
 - c. \$660.00
 - d. \$600.00

(NOTE: The student must obtain a miminum score of _____ of the Unit VII test in order to receive an evaluation for Competencies E1, E2, and E3.)

T 40

**Number of
correct
answers
on this page**

ANSWERS TO UNIT VII TEST

1. D
2. A
3. B
4. B
5. C
6. A
7. B
8. C
9. B
10. D
11. A
12. B
13. D
14. B

LEWIS & CLARK CAREER CENTER

COOPERATIVE WORK RELEASE PROGRAM AGREEMENT

- I 1. The cooperative work release program provides an opportunity for a student to work during the time he or she would normally be attending classes at Lewis & Clark Career Center. The program is available to students who have completed the first semester of their second year of instruction at Lewis and Clark.
2. To qualify for this program, a student must have good attendance, good work habits, make at least a "B" average for the current school year, and be recommended by his/her vocational instructor.
*Current Grade: _____ *Days Missed this Year: _____
*Must be initialed by vocational instructor.
3. The earliest beginning date for the work program will be the first day of the last semester of the program.
4. The work experience must be in the occupational field in which the student has received training at Lewis & Clark Career Center.
5. Students will not be allowed to work for members of their immediate families.
6. The work release program requires the approval of the vocational instructor, the high school principal, the student's parents, and the vocational director.
7. The student is responsible for providing a completed employer training agreement prior to the first day of employment
8. The student must attend his/her classes at the home school. Should a student fail to attend classes on a day that he or she worked, the agreement is immediately terminated and the student must return to class at Lewis & Clark Career Center.
9. The student must be on the job during the agreed hours of employment.
10. Should the employment terminate for any reason, the student must report for classes at Lewis & Clark immediately.
11. Lewis & Clark Career Center and the home high school will not be responsible for any accidents or job related problems while the student is in route to the job site or during the employment.

This agreement has been read and approved by the following:

Student

Vocational Director

Vocation Instructor

Parent

High School Principal

Date

Employer Student Agreement

II. Student's Name _____ Employers Name _____

Employer's Address _____
City State Zip

Employer's Telephone _____ Start Date _____

Hours of Employment _____ Days to Work _____

Description of work to be performed: _____

- III. The EMPLOYER agrees to provide a training station which will offer as much variety in work experiences for the student as is practically and economically possible, so that the student will receive broad occupational training. This includes adequate supervision and instruction, evaluating the students's progress once every week, not discharging the student without first consulting the coordinator in regard to such matters, not discriminating against students on the basis of race, color, national origin, gender, or disability in making available opportunities in cooperative education; and paying a beginning wage of \$ _____ hour for _____ hours per school week. The employer/supervisor agrees to notify the school in case the student is absent or if there are other problems relating to the student's employment.

Employer or Supervisor's Signature Date Student's Signature Date

Note: Return completed form to Lewis & Clark Career Center

Private Transportation Consent Form

Dear Parent or Guardian and Student ,

At times it becomes necessary to use private vehicles to transport students to and from school sponsored activities. When this occurs, the school district requires the student and their parent or guardian sign the Private Transportation Release Consent Form that appears below:

Name of Activity: _____

Location of Activity: _____

Date(s) of Activity: _____

Name of Sponsor: _____

RETURN THIS FORM TO THE SCHOOL BY: _____
Date

My child, _____, has my permission to travel from school property (or other location) to this activity by private transportation, either as the driver or as a passenger in a private automobile driven by another student, parent, or other person. I understand and acknowledge that the St. Charles R-VI School District will have no financial or legal responsibility for injuries arising out of such travel.

By signing this form, I hereby release the District, as well as its directors, officers, administrators, employees, and other agents from all liability for any and all injuries arising from my child's travel to this activity via private transportation. I further agree to indemnify and hold harmless the district, as well as its directors, officers, administrators, employees, and other agents, against any claims asserted by my child as a result of his or her travel to this activity via private transportation.

Parent or Guardian

Parent or Guardian

Date

Date

To be signed by students 16 years of age or older if either driving or riding in a private vehicle to a school sponsored event.

I acknowledge that the District will have no financial or legal responsibility for injuries arising out of my travel from school (or other location) to this activity. I further acknowledge that I have a responsibility to travel directly from school (or other location) to the activity and that failure to report to this activity on time may result in discipline, up to and including possible dismissal from this activity. I further acknowledge that inappropriate conduct during travel to this activity may result in such discipline, as well as additional discipline under Board of Education Policy, as such Policy applies to out-of-school misconduct.

Student Signature

Date

STUDENT EVALUATION
LEWIS & CLARK CAREER CENTER
2400 Zumbahl Road
St. Charles, MO 63301
Phone (636)946-7726 Fax (636)946-8472

_____ To
Student Employer Supervisor Time Period Covered

Please rate the student according to how well he/she performs the task or meets the specific objectives taking into consideration the amount of time or training received on the job.

Ratings:

- 1. Exceptional or superior performance.
- 2. Very good or above average performance.
- 3. Satisfactory or average performance.
- 4. Below average performance.
- 5. Unsatisfactory performance.
- N. Does not apply or I have not had a chance to observe as yet.

Dates absent or late: _____

*Please call 723-4829 or 946-7726 on any days tardy or absent.

Specific Rating (use above scale):

- _____ 1. Does the student report to work at the scheduled time?
- _____ 2. Does the student notify you in case of illness with enough notice that you can get a replacement if needed?
- _____ 3. Does the student keep requests to be absent from work to a minimum and give adequate notice to the employer?
- _____ 4. Does the student attempt to get along well with other employees/customers?
- _____ 5. Does the student attempt to get along well with the employer?
- _____ 6. Does the student dress appropriately for work and is neat and clean about physical appearance?
- _____ 7. Does the student keep confidences concerning business procedure or operations?
- _____ 8. Does the student perform his/her task willingly?
- _____ 9. Does the student accept criticism graciously and then attempt to correct the problem?
- _____ 10. Does the student seek tasks to do when none are assigned?
- _____ 11. Does the student, in general, use common sense and is he/she conscientious about the welfare of the company?
- _____ 12. Does the student know and observe proper safety habits at all times?
- _____ 13. Does the student remain attentive at all times and follow all instructions given?
- _____ 14. Does the student correctly identify, use, and maintain hand tools, power tools, and equipment?
- _____ 15. Does the student perform his/her tasks and duties to the best of his/her ability and is willing to learn from coworkers?

Overall rating of student: _____

Comments: _____

Lewis Clark Career Center

2006 - 2007 Placement Summary

Total Students:	20	
Total Placed:	19	95%
Total Placed Related:	3	15%
Positive MSIP Placement:	12	60%
<hr/>		
Employed Related:	3	15%
Employed Not Related:	7	35%
Military Related:	0	0%
Military Not Related:	4	20%
Continuing Education Related:	0	0%
Continuing Education Not Related:	5	25%
Not Available:	0	0%
Not Placed:	1	5%
Status Unknown (Not Found):	0	0%

Lewis Clark Career Center
 2007 Follow Up Summary (by Teacher)

Special Category	Actual Graduates	Employed Related	Employed Not Rel.	Cont Ed Related	Cont Ed Not Rel.	Not Placed	Not Availabl	Status Unknow	Military Related	Military Not Rel.	<i>Total**</i>	<i>Concen-trators**</i>
ALL	20	3	7	0	5	1	0	0	0	4	20	18
DISABL	8	0	3	0	2	0	0	0	0	3	8	6
DISADV	1	0	0	0	1	0	0	0	0	0	1	1

**The columns marked with asterisks will not need to be input into the Core Data System, for use as a cross reference only.