

Steel Center CTE

Course Name: Auto Collision Repair & Refinishing 2019-20

Unit Name: PA100 - SAFETY

Unit Number: PA100

Dates: Fall 2019 **Hours:** 60.

Unit Description/Objectives:

Student will know and be able to identify all safety requirements related to the auto body field.

Tasks:

PA101 - Establish general shop safety.

PA102 - Demonstrate proper use of personal safety devices and clothing.

PA103 - Locate and identify fire extinguishers.

PA104 - Locate and operate emergency switches.

PA105 - Explain fire and tornado drill procedures.

PA106 - Demonstrate proper handling of hazardous materials.

PA107 - Identify proper chemical disposal techniques.

PA108 - Operate shop and spray area ventilation systems properly.

PA109 - List rules for care and safe use of hand tools.

PA110 - Demonstrate safe and proper use of hydraulic tools; electric powered, pneumatic equipment.

PA111 - Identify the proper methods and options for safely moving vehicles in the shop area.

PA112 - Identify information on Material Safety Data Sheets (MSDS).

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.

Supporting Standards/Anchors

3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.

CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

Focus Standard/Anchor #2

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

Connecting Standard/Anchor

- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Supporting Standards/Anchors

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

13.1.11A Relate careers to individual interests, abilities and aptitudes

CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Complete SP/2 Safety training on-line
List the types of dangers and accidents common to a collision repair facility
Explain how to avoid shop accidents

Outline the control measures needed when working with hazardous substances
Summarize hand and power tool safety
List the types of dangers and accidents common to a collision repair facility
Explain how to avoid shop accidents
Outline the control measures needed when working with hazardous substances
Summarize hand and power tool safety
Describe safety practices designed to avoid fire and explosions
Identify and explain general purpose hand tools
Identify and explain the use for the most important collision repair hand tools
Compare the advantages and disadvantages of different tools
Properly select the right tool for the job
Maintain and store tools properly
Identify power tools found in a collision repair facility
Explain the purpose of each type of power tool
Summarize how to safely use tools
Identify the typical types of equipment used in collision repair
Describe how to use collision repair equipment
Select the right power tool or piece of equipment for the job
Explain low emissions spray equipment and regulations
Explain the operation of spray booths and drying rooms
Identify the various types of spray guns and explain how each type operates
Describe the recommended maintenance program for a spray booth
Operate and maintain a spray gun
Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations.HP-I
REF01 Modules 4
REF03 Modules 2, 4
WKR01 Modules 3
Identify safety and personal health hazards according to OSHA guidelines and "Right to Know".
HP-I WKR01 Modules 1
Inspect spray environment to ensure compliance with federal, state, and local regulations, and for safety and cleanliness hazards.
HP-I REF01 Modules 3
WKR01 Modules 5
Select and use the NIOSH approved personal sanding respirator.
Inspect condition and ensure fit and operation.
Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulations.
HP-I WKR01 Modules 4
Select and use the NIOSH approved (Fresh Air Make-up System) personal painting/refinishing respirator system.
Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation.
HP-I REF01 Modules 2
WKR01 Modules 4
Select and use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (gloves, suits, hoods, eye, and ear protection, etc.).
HP-I REF02 Modules 2
REF03 Modules 2, 4
WKR01 Modules 4

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets

- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

Student must:

- Pass all S/P2 assigned certification
- Pass safety test with 100% for all tools and equipment
- Handle material in a safe and workmanlike manner
- Use protective clothing and equipment
- Use hand tools in a safe manner
- Use adequate ventilation when working in enclosed area
- Follow manufacturer's directions when using any product, tool, equipment, etc.
- Use proper safety precautions when using /operating hand tools.
- Use tools and equipment in a professional work like manner according to OSHA standards
- Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Quizzes
- Pre/Post Tests
- Time Cards
- Weekly logs
- Writing Activities
- Rubrics
- Individual Projects
- Any content related assessment
- Portfolio
- SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016).Auto Body Repair technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL..

- Hand tools
- Grinders
- Finish Sanders

- DA Sander
- Cut Off Wheel
- Air Saw

Stinger
English Wheel
Brake Press
Spray Booth
Mig Welder
Torch
Frame Machine
Lift
Jack
DuPont Refinisher magazine
Promotional materials from post-

secondary institutions
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety
Training
ICAR Student Discs
Internet resources



Unit Name: PA200 - VEHICLE OF AUTOBODY
DESIGN AND CONSTRUCTION

Unit Number: PA200

Dates: Fall 2019 **Hours:** 50.00

Unit Description/Objectives:

Student will know and be able to list, describe, and identify the various types or parts of a unibody vehicle.

Tasks:

PA201 - List the differences between a unibody vehicle and a full frame vehicle.

PA202 - Identify and describe structural and nonstructural panels of a unibody vehicle.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
- CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
- CC.3.5.11-12.A. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text

Supporting Standards/Anchors

- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

Connecting Standard/Anchor

- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.

Supporting Standards/Anchors

- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
- CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.
- CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
- CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
- CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Define the most important parts of a vehicle
- Explain body design and frame variations
- Compare unibody and body-over-frame construction
- Identify the major structural parts, sections, and assemblies of body-over-frame vehicles
- Identify the major structural parts, sections and assemblies of unibody vehicles.

Remediation:

- Re-teach major concepts
- Review with teacher assistance
- Study group
- Worksheets
- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

- Student must:
- Pass all assigned S/p2 certifications
- Pass safety test with 100% for all tools and equipment
- Handle material in a safe and workmanlike manner
- Use protective clothing and equipment
- Use hand tools in a safe manner
- Use adequate ventilation when working in enclosed area
- Follow manufacturer's directions when using any product, tool, equipment, etc.
- Use proper safety precautions when using /operating hand tools.
- Use tools and equipment in a professional work like manner according to OSHA standards
- Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Quizzes
- Pre/Post Tests
- Time Cards
- Writing Activities
- Rubrics
- Individual Projects
- Any content related assessment
- Portfolio
- SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016).Auto Body Repair Technology 6th edition . Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair

Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Automotive Body Repair News (ABRN) magazine Volume 47-49.

Hand tools

Frame Machine

Lift

Jack

Assorted Vehicles

Internet websites: ICAR, ASE, SP/2 Safety Training

ICAR Student Discs

Internet resources

Promotional materials from post-secondary institutions

Technology integration I-CAR advanced delivery curriculum

Internet resources

Assorted tool catalogs

Computer

Fire extinguisher

Respirator

Eye Wash Station

Unit Name: PA300 – Panel Replacement and Alignment

Unit Number: PA300

Dates: Fall 2019 **Hours:** 50.00

Unit Description/Objectives:

Student will know and be able to prep vehicle for a non-structural repair following the estimated repair sequence and using the appropriate tools and equipment.

Tasks:

- PA301 - install panels using various alignment methods (weld, Bolt)
- PA302 - Remove, Reinstall, and align bolt on panels
- PA303 – Remove and reinstall wheel assembly
- PA304 – Aim headlights using mechanical aiming equipment
- PA305 – Replace wheels/tires

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Supporting Standards/Anchors

- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
- CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
- CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
- CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
- CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
- CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Describe different types of metals used in vehicle construction
- Summarize the deformation effects of impacts on steel
- Use a hammer and dolly to straighten
- Explain how to straighten with spoons
- List the steps for shrinking metal
- Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
- Explain how damage repair estimates are determined
- Properly select the right tool for the job
- Select the right power tool or piece of equipment for the job
- Review damage report and analyze damage to determine appropriate methods for overall repair; develop and document repair plan. HP-I Inspect, remove, store, and replace exterior trim and moldings.

Inspect, remove, store, and replace interior trim and components. HP-I

Remediation:

- Re-teach major concepts
- Review with teacher assistance
- Study group
- Worksheets
- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

- Student must:
- Pass safety test with 100% for all tools and equipment
- Handle material in a safe and workmanlike manner
- Use protective clothing and equipment
- Use hand tools in a safe manner
- Use adequate ventilation when working in enclosed area
- Follow manufacturer's directions when using any product, tool, equipment, etc.
- Use proper safety precautions when using /operating hand tools.
- Use tools and equipment in a professional work like manner according to OSHA standards
- Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Quizzes
- Pre/Post Tests
- Time Cards
- Writing Activities
- Rubrics
- Individual Projects
- Any content related assessment
- Portfolio
- SP/2 Safety Training web based assessment

Resources/Equipment:

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Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum.
Chicago:IL.

Protective Tape
Welding Blankets
Hand tools
Grinders
Finish Sanders
DA Sander
Cut Off Wheel
Air Saw
Stinger
English Wheel
Brake Press
Spray Booth
Mig Welder
Torch
Frame Machine
Lift
Jack
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Unit Name: PA400 - WORKING WITH TRIM
AND HARDWARE

Unit Number: PA400

Dates: Fall 2019 **Hours:** 40.00

Unit Description/Objectives:

Student will know and be able to remove and replace interior trim, moldings and disarm and diagnose supplemental restraint systems.

Tasks:

PA401 – Identify the principles of full or partial panel replacement (bonded, bolted, or welded)

PA402 - Identify the types of fasteners.

PA403 - Remove and replace adhesive-held molding and trim.

PA404 - Remove and replace seats.

PA405 - Remove and reinstall carpeting.

PA407 - Remove and install exterior Parts and hardware.

PA408 - Remove and install pinstripes, decals, and emblems.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific

words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Supporting Standards/Anchors

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.

CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.

CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.

CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Identify the various fasteners used in vehicle construction
- Remove and install bolts and nuts properly
- Properly select the right tool for the job
- Identify the major parts of a vehicle's interior
- Remove and replace seats, seat covers, and carpeting
- Service an instrument cluster and other dashboard parts
- Explain how to replace headliners
- Explain the difference between an active and a passive restraint system
- Learn how to service seat belts
- Remove, align, and install molding and emblems
- Properly remove and install vinyl decals and striping
- Prepare the surface before applying adhesive overlay material or before custom painting
- Describe the operation of air bag systems
- Repair air bag systems safely
- Inspect, remove, store, and replace interior trim and components. HP-I
DAM04 Modules 1
TRM01 Modules 5
- Inspect, remove, store, and replace non-structural body panels and components that may interfere with or be damaged during repair. HP-I
DAM02 Modules 2, 3
DAM04 Modules 3
EXT01 Modules 1, 2, 3, 4, 5
- Disarm SRS in accordance with manufacturer's specifications/procedures. HP-I RES01 Modules 1
- Inspect, remove, and replace sensors and wiring in accordance with manufacturer's specifications/procedures; ensure sensor orientation. HP-G DAM04 Modules 1
RES01 Modules 1
- Inspect, remove, replace, and dispose of deployed SRS modules in accordance with manufacturer's specifications/procedures. HP-G
DAM04 Modules 1
RES01 Modules 1
- Verify that SRS is operational in accordance with manufacturer's specifications/procedures. HP-I
RES01 Modules 2
- Inspect, remove, replace, and dispose of non-deployed SRS in accordance with manufacturer's specifications/procedures. HP-G
RES01 Modules 1

Remediation:

- Re-teach major concepts
- Review with teacher assistance
- Study group
- Worksheets

- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

Student must:

- Pass safety test with 100% for all tools and equipment
- Handle material in a safe and workmanlike manner
- Use protective clothing and equipment
- Use hand tools in a safe manner
- Use adequate ventilation when working in enclosed area
- Follow manufacturer’s directions when using any product, tool, equipment, etc.
- Use proper safety precautions when using /operating hand tools.
- Use tools and equipment in a professional work like manner according to OSHA standards
- Know and follow the established safety rules at all times

Assessment:

Worksheets	Individual Projects
Quizzes	Any content related assessment
Pre/Post Tests	Portfolio
Time Cards	SP/2 Safety Training web based
Writing Activities	assessment
Rubrics	

Resources/Equipment:

Duffy, J.E.(2016) Auto Body Repair Technology 6th edition . Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

- Protective Tape
- Welding Blankets
- Hand tools
- Grinders
- Finish Sanders
- DA Sander
- Cut Off Wheel
- Air Saw
- Stinger
- English Wheel
- Brake Press

Spray Booth

Eye Wash Station
Internet
websites: ICAR,
ASE, SP/2 Safety



Course Name: Auto Collision Repair and Refinishing 2019-20

Unit Name: PA500 – METAL FINISHING

Unit Number: PA500

Dates: Fall 2019 **Hours:** 50.00

Unit Description/Objectives:

Student will know and be able to use straightening tools to shrink and straighten metal.

Tasks:

PA501 - Use metal straightening tools to include hammers and dollies.

PA502 –Describe heat shrinking method for stretched metal.

PA503 –Demonstrate weld-on nail gun to repair sheet metal.

PA504 –Repair metal to industry standard..

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Supporting Standards/Anchors

- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
- CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
- CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
- CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
- CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
- CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Describe different types of metals used in vehicle construction
- Summarize the deformation effects of impacts on steel
- Use a hammer and dolly to straighten

Explain how to straighten with spoons
List the steps for shrinking metal
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Explain how damage repair estimates are determined
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Mask a vehicle properly
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Heat shrink stretched panel areas to proper contour according to manufacturer's specifications. HP-G
STS01 Modules 2
Cold shrink stretched panel areas to proper contour. HP-G
STS01 Modules 2

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:

Pass assigned S/p2 certifications.
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment

Resources/Equipment:

Duffy, J.E.(2016).Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Hand tools

Grinders

Finish Sanders

DA Sander

Cut Off Wheel

Air Saw

Stinger

English Wheel

Brake Press

Fire extinguisher

Respirator

Eye Wash Station

Internet websites: ICAR, ASE, SP/2 Safety Training

ICAR Student Discs

Internet resources



Unit Name: PA600 - USING BODY FILLERS

Unit Number: PA600

Dates: Fall 2019 **Hours:** 30.00

Unit Description/Objectives:

Student will know and be able to properly use body filler and tools.

Tasks:

PA601 - Select correct body filler and tools.

PA602 - Prepare surface for body filler.

PA603 - Mix and apply body filler.

PA605 – Sand body fillers top correct contour.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text

Supporting Standards/Anchors

- CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
- CC.3.5.11-12.A. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
- CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Describe different types of metals used in vehicle construction
- Summarize the deformation effects of impacts on steel
- Use a hammer and dolly to straighten
- Explain how to straighten with spoons
- List the steps for shrinking metal
- Explain how damage repair estimates are determined
- Properly select the right tool for the job
- Select the right power tool or piece of equipment for the job
- Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
- Mask a vehicle properly
- Explain how damage repair estimates are determined

Identify and explain the most common abbreviations used in collision estimating guides
Remove paint from the damaged area of a body panel. HP-I
STS01 Modules 2
Locate and reduce surface irregularities on a damaged body panel. HP-I
DAM02 Modules 3
FCR01 Modules 2
STS01 Modules 1, 2
Demonstrate hammer and dolly techniques. HP-I
STS01 Modules 2
Heat shrink stretched panel areas to proper contour according to manufacturer's specifications. HP-G
STS01 Modules 2
Cold shrink stretched panel areas to proper contour. HP-G
STS01 Modules 2
Mix body filler. HP-I
STS01 Modules 2
Apply body filler; shape during curing. HP-I
STS01 Modules 2
Rough sand cured body filler to contour; finish sand. HP-I
STS01 Modules

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities

Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016).Auto Body Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Protective Tape

Welding Blanket

Hand tools

Finish Sanders

DA Sander

Cut Off Wheel

Air Saw

Stinger

Assorted tool catalogs

Computer

Assorted vehicles

Fire extinguisher

Respirator

Eye Wash Station

Internet websites: ICAR, ASE, SP/2 Safety Training

ICAR Student Discs

Internet resources



Unit Name: PA700 - MOVEABLE GLASS AND
HARDWARE

Unit Number: PA700

Dates: Fall 2019 **Hours:** 40.00

Unit Description/Objectives:

Student will know and be able to remove and replace a door regulator and glass.

Tasks:

PA701 - Remove and replace a door regulator.

PA702 - Remove and repair moveable door class.

PA703 - Remove and replace of stationary glass

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Supporting Standards/Anchors

- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
- CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
- CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
- CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
- CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
- CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Remove and Replace and adjust a door regulator
- Inspect, adjust, repair, or replace window regulators, run channels, glass, power mechanisms, and related controls. HP-G

Remediation:

- Re-teach major concepts
- Review with teacher assistance
- Study group
- Worksheets
- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

- Student must:
 - Pass assigned S/P2 certification.
 - Pass safety test with 100% for all tools and equipment
 - Handle material in a safe and workmanlike manner
 - Use protective clothing and equipment
 - Use hand tools in a safe manner
 - Use adequate ventilation when working in enclosed area
 - Follow manufacturer's directions when using any product, tool, equipment, etc.
 - Use proper safety precautions when using /operating hand tools.
 - Use tools and equipment in a professional work like manner according to OSHA standards
 - Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Quizzes
- Pre/Post Tests
- Time Cards
- Weekly logs
- Writing Activities
- Rubrics
- Individual Projects
- Any content related assessment
- Portfolio
- SP/2 Safety Training web based assessment

Resources/Equipment:

- Duffy, J.E.(2016) Auto Body Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.
- Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.
- Magee, R. (2016). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.
- Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Protective Tape
Welding Blankets
Hand tools
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Unit Name: PA800 - STRUCTURAL REPAIR –
DAMAGE ANALYSIS

Unit Number: PA800

Dates: Fall 2019 **Hours:** 77.00

Unit Description/Objectives:

Student will know and be able to do structural repair - damage analysis.

Tasks:

PA801 - Classify the various types and extent of damage a vehicle sustains from an accident.

PA802 - Select and interpret body dimension specification sheets and/or manuals.

PA803 - Set up and use tram gauge to diagnose vehicle length and width damage.

PA804 - Explain how to diagnose vehicle height damage with datum line gauges.

PA805 - Identify aspects of universal measuring system.

PA806 – Identify repair methods for vehicle with diamond damage, twist, sag side swag or mash.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
- CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

CC.3.5.11-12.A. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Supporting Standards/Anchors

CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.

CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.

CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.

CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.

CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.

CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Diagnose and measure structural damage using tram and self-centering gauges according to industry
- Explain how impact forces are transmitted through frame and unibody construction vehicles
- Describe how to visually determine the extent of impact damage
- List the various types and variations of body measuring tools
- Analyze damage by measuring body dimensions
- Given a damaged vehicle and a body specification manual, locate and measure key points using a tape measure, tram bar, and self-centering gauges
- Attach vehicle to anchoring devices. universal measuring system (mechanical, electrical,

Remediation:

- Re-teach major concepts
- Review with teacher assistance
- Study group
- Worksheets
- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

- Student must:
- Pass assigned S/P2 certification
- Pass safety test with 100% for all tools and equipment
- Handle material in a safe and workmanlike manner
- Use protective clothing and equipment
- Use hand tools in a safe manner
- Use adequate ventilation when working in enclosed area
- Follow manufacturer's directions when using any product, tool, equipment, etc.
- Use proper safety precautions when using /operating hand tools.
- Use tools and equipment in a professional work like manner according to OSHA standards
- Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Quizzes

Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016) Auto Body Reapair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Protective Tape
Welding Blankets
Hand tools
Computer
Assorted vehicles
Frame machine
Tram gauge
Frame specification manuals
Centerline gauges
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Unit Name: PA 900 – STRAIGHTENING
STRUCTURAL PARTS

Unit Number: PA 900

Dates: Fall 2019 **Hours:** 60.00

Unit Description/Objectives:

Student will know and be able to mount and anchor a vehicle.

Tasks:

PA901 - Demonstrate knowledge to mount and anchor vehicle to a pulling system.

PA902 - Prepare vehicle for gauging and analysis.

PA903 - Prepare vehicle for alignment.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

Supporting Standards/Anchors

- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
- CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
- CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
- CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
- CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
- CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
- CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
- CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
- CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions

Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Describe different types of metals used in vehicle construction
Summarize the deformation effects of impacts on steel
Use a hammer and dolly to straighten
Explain how to straighten with spoons
List the steps for shrinking metal
Explain how damage repair estimates are determined
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Mask a vehicle properly
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Identify all types of vehicle construction. HP-1
SPS03 Module,1 Program 3
Identify five types body damage HP-1
FCR01 Module 2
Demonstrate how to interpret and use vehicle specification manuals HP-G
MEA01 Modules 2,3
Identify the uses of high strength steel in vehicle construction HP-1
SPS02 Module 1
Demonstrate how to read a fractional-inch and metric tape measures HP-1
Diagnose damage using a tram gauge and a tape measure HP-1
MEA01 Module 1

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass assigned S/P2 certification
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.

Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016) Auto Body Technology 6th edition.Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum.
Chicago:IL.

Protective Tape
Welding Blankets
Hand tools
Cut Off Wheel
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources



Steel Center CTE

Course Name: Auto Collision Repair & Refinishing 2019-20

Unit Name: PA1000 - RESTORING CORROSION
PROTECTION

Unit Number: PA1000

Dates: Fall 2019 **Hours:** 47.00

Unit Description/Objectives:

Student will know and be able to identify types of corrosion and methods of corrosion protections and protection of interior, exterior, and accessories surfaces.

Tasks:

PA1001 - Identify corrosion principles and factory corrosion protection.

PA1002 - Identify repair methods and materials for corrosion protection.

PA1003 – Describe the application of seam sealers.

PA1004 – Apply Caulking and seam sealers.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

Focus Standard/Anchor #2

- CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

Supporting Standards/Anchors

- CC.3.5.11-12.A. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- CC.3.6.11-12.F. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.3.5.9-10.G. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
- CC.3.5.11-12.J. By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
- Properly select the right tool for the job
- Select the right power tool or piece of equipment for the job
- Mask a vehicle properly
- Identify the principal methods of rust protection
- Choose the correct antirust materials and equipment

Remediation:

- Re-teach major concepts
- Review with teacher assistance

- Study group
- Worksheets
- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

Student must:

- Pass assigned S/P2 certification
- Pass safety test with 100% for all tools and equipment
- Handle material in a safe and workmanlike manner
- Use protective clothing and equipment
- Use hand tools in a safe manner
- Use adequate ventilation when working in enclosed area
- Follow manufacturer's directions when using any product, tool, equipment, etc.
- Use proper safety precautions when using /operating hand tools.
- Use tools and equipment in a professional work like manner according to OSHA standards
- Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Quizzes
- Pre/Post Tests
- Time Cards
- Writing Activities
- Rubrics
- Individual Projects
- Any content related assessment
- Portfolio
- SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016) Auto Body Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Protective Tape
Welding Blankets

Hand tools
Grinders

Mig Welder
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator

Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety
Training
ICAR Student Discs
Internet resources

Unit Name: PA1100 - WELDING AND CUTTING-
MIG (GMAW) WELDING

Unit Number: PA1100

Dates: Fall 2019 **Hours:** 60.00

Unit Description/Objectives:

Student will know and be able to set up welder and complete several types of welds, while demonstrating personal and vehicle protections.

Tasks:

PA1101 –Identify different methods of attaching structural components [MIG welding, Squeeze type resistance spot-welding (STRSW) Riveting, Structural adhesive, silicon bronze,ect].

PA1102 - Demonstrate personal safety practices and vehicle protection measures.

PA1103 - Set up the Mig welder.

PA1104 - Complete a butt joint with backing in various welding positions.

PA1105 - Complete a fillet weld lap joint.

PA1106 - Complete a plug weld in various positions.

PA1107 - Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.

- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
- 3.2.P.B3 Analyze the factors that influence convection, conduction, and radiation between objects or regions that are at different temperatures.
- 3.2.C.B3 Describe the law of conservation of energy. Explain the difference between an endothermic process and an exothermic process.
- 3.1.C.A2 Describe how changes in energy affect the rate of chemical reactions.
- 3.2.10.B3 Explain how heat energy will move from a higher temperature to a lower temperature until equilibrium is reached. Analyze the processes of convection, conduction, and radiation between objects or regions that are at different temperatures.

Focus Standard/Anchor #2

- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

Supporting Standards/Anchors

- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
- CC.3.5.9-10.I. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.
- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
- CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes

Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Properly select the right tool for the job
Describe when to use and when NOT to use certain welding processes for collision repair
Name the parts of a MIG welder
Summarize how to set up a MIG welder
Describe the differences between MIG electrode wires
Explain the variables for making a quality MIG weld
Describe the various types of MIG welds and joints
Explain the resistance spot welding process
Explain the differences in welding aluminum compared to steel
Describe plasma arc cutting
Identify weldable and non-weldable materials used in collision repair. HP-I
FCR01 Modules 1
Weld and cut high-strength steel and other steels using manufacturer's specifications/procedures. HP-I
WCS01 Modules 1, 2, 3, 4
Weld and cut aluminum using manufacturer's specifications/procedures. HP-G
WCA01 Modules 1, 2
Determine the correct GMAW (MIG) welder type, electrode, wire type, diameter, and gas to be used in a specific welding situation. HP-I
WCS01 Modules 1
Set up and adjust the GMAW (MIG) welder to "tune" for proper electrode tickout, voltage, polarity, flow rate, and wire-feed speed required for the material being welded. HP-I
WCS01 Modules 1
Store, handle, and install high-pressure gas cylinders. HP-I
WCS01 Modules 1
Determine work clamp (ground) location and attach. HP-I
WCS01 Modules 1
Use the proper angle of the gun to the joint and the direction of the gun travel for the type of weld being made in the flat, horizontal, vertical, and overhead positions. HP-I
WCS01 Modules 1
Protect adjacent panels, glass, vehicle interior, etc. from welding and cutting operations. HP-I
WCS01 Modules 1
Protect computers and other electronic control modules during welding procedures according to manufacturer's specifications. HP-I
WCS01 Modules 1
Clean and prepare the metal to be welded, assure good metal fit-up, apply weld-through primer if necessary, and clamp as required. HP-I
WCS01 Modules 1
Determine the joint type (butt weld with backing, lap, etc.) for weld being made according to manufacturer's/industry specifications. HP-I
SPS01 Modules 1
SPS02 Modules 1
SPS03 Modules 2, 3
Determine the type of weld (continuous, butt weld with backing, plug, etc.) for each specific welding operation according to manufacturer's/industry specifications. HP-I
SPS01 Modules 1
SPS02 Modules 1
SPS03 Modules 2, 3
Perform the following welds: continuous, stitch, tack, plug, butt weld with backing, and lap joints. HP-I
WCS01 Modules 2, 3, 4
Perform visual and destructive tests on each weld type. HP-I
WCS01 Modules 2, 3, 4

Identify the causes of various welding defects; make necessary adjustments. HP-I
WCS01 Modules 1
Identify cause of contact tip burn-back and failure of wire to feed; make necessary adjustments. HP-I
WCS01 Modules 1
Identify cutting process for different materials and locations in accordance with manufacturer's procedures; perform cutting operation. HP-G
WCS05 Modules 4
Identify different methods of attaching structural components (squeeze type resistance spot welding (STRSW), riveting, structural adhesive, silicone bronze, etc.) HP-G
SPA01 Modules 2
SPA02 Modules 1, 2
SPS03 Modules 4
WCS04 Modules 1, 2, 3
Describe different types of metals used in vehicle construction
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass assigned S/P2 certification
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets	Individual Projects
Quizzes	Any content related assessment
Pre/Post Tests	Portfolio
Time Cards	SP/2 Safety Training web based assessment
Writing Activities	
Rubrics	

Resources/Equipment:

Duffy, J.E.(2016) Auto Body Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Protective Tape

Welding Blankets

Hand tools

Mig Welder

Welding Helmut

Welding Gloves

Sheet Metal

Fire extinguisher

Respirator

Eye Wash Station

Internet websites: ICAR, ASE, SP/2 Safety Training

ICAR Student Discs

Internet resources



Unit Name: PA1200 - CUTTING AND HEATING
PROCESSES

Unit Number: PA1200

Dates: Fall 2019 **Hours:** 40.00

Unit Description/Objectives:

Student will know and be able to set up and demonstrate proper sheet metal cutting processes.

Tasks:

PA1201 - Identify cutting processes.

PA1202 - Demonstrate sheet metal cutting processes.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
- 3.2.10.B3 Explain how heat energy will move from a higher temperature to a lower temperature until equilibrium is reached. Analyze the processes of convection, conduction, and radiation between objects or regions that are at different temperatures.

Focus Standard/Anchor #2

- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

Supporting Standards/Anchors

- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
- CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
- CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
- CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
- CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
- CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
- CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
- CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes

Demonstrate safe use of tools
Complete assigned individual projects
Describe plasma arc cutting

Skill:

Describe plasma arc cutting
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Weld and cut high-strength steel and other steels using manufacturer's specifications/procedures. HP-I
WCS01 Modules 1, 2, 3, 4
Weld and cut aluminum using manufacturer's specifications/procedures. HP-G
WCA01 Modules 1, 2
Determine work clamp (ground) location and attach. HP-I
WCS01 Modules 1
WCS05 Modules 4

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass assigned S/P2 certification
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects

Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016) Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Collision Repair Fundamental. Clifton Park: NY: Thomson Delmar Learning.

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Plazma Cutter
Welding Gloves
Protective Eye Shield
Protective Tape
Welding Blankets
Hand tools
Grinders
Torch
Sheet Metal
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Unit Name: PA1300 – SURFACE PREPARATION, REFINISHING, AND EQUIPMENT.

Unit Number: PA1300

Dates: Fall 2019 **Hours:** 60.00

Unit Description/Objectives:

Student will know and be able to explain various regulations as well as locate hazardous warnings and inspect personal safety equipment.

Tasks:

PA1301 - Explain various environmental regulations and other items regulated in an automotive refinishing department.

PA1302 - Locate hazardous warning information.

PA1303 - Select and inspect personal safety equipment and clothing needed for protection during refinishing operations.

PA1304 - Demonstrate safe painting practices and use of protective clothing equipment.

PA1605 - Identify personal health and safety hazards according to OSHA guidelines.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
- CC.3.5.11-12.A. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Focus Standard/Anchor #2

- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

Supporting Standards/Anchors

CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

CC.3.6.11-12.F. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects
List the types of dangers and accidents common to a collision repair facility
Explain how to avoid shop accidents
Outline the control measures needed when working with hazardous substances
Summarize hand and power tool safety

Skill:

Describe safety practices designed to avoid fire and explosions
Explain the benefits of ASE certification
Summarize the purpose of I-CAR
Know the sources of professional training and certification available to collision repair facility personnel
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Identify and take necessary precautions with hazardous operations and materials according to federal, state, and local regulations. HP-I

REF01 Modules 4
REF03 Modules 2, 4
WKR01 Modules 3
Identify safety and personal health hazards according to OSHA guidelines and "Right to Know". HP-I
WKR01 Modules 1
Inspect spray environment to ensure compliance with federal, state, and local regulations, and for safety and cleanliness hazards. HP-I
REF01 Modules 3
WKR01 Modules 5
Select and use the NIOSH approved personal sanding respirator. Inspect condition and ensure fit and operation. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulations. HP-I
WKR01 Modules 4
Select and use the NIOSH approved (Fresh Air Make-up System) personal painting/refinishing respirator system. Perform proper maintenance in accordance with OSHA Regulation 1910.134 and applicable state and local regulation. HP-I
REF01 Modules 2
WKR01 Modules 4
Select and use the proper personal safety equipment for surface preparation, spray gun and related equipment operation, paint mixing, matching and application, paint defects, and detailing (gloves, suits, hoods, eye, and ear protection, etc.). HP-I
REF02 Modules 2
REF03 Modules 2, 4
WKR01 Modules 4

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Quizzes
- Pre/Post Tests
- Time Cards
- Writing Activities
- Rubrics
- Individual Projects
- Any content related assessment
- Portfolio
- SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016).Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

- Respirator
- Gloves
- Paint Suit
- Fresh Air hood
- Eye Wash Station
- Internet websites: ICAR, ASE, SP/2 Safety Training
- ICAR Student Discs
- Internet resources



Unit Name: PA1400 Automotive Finishes

Unit Number: PA1400

Dates: Fall 2019 **Hours:** 60.00

Unit Description/Objectives:

Student will know and be able to describe and identify paint defects while demonstrating use of refinishing equipment.

Tasks:

PA1401 - Describe the difference between paint systems and why the materials are applied by the manufacturer.

PA1402 - Describe paint defects - causes and cures.

PA1403 – Identify various undercoats.

PA1404 – Identify various topcoats (single stage, basecoat/clearcoat, tricoat).

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- CC.3.5.9-10.B. Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
- CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Focus Standard/Anchor #2

- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

Supporting Standards/Anchors

- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
- CC.3.5.9-10.I. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
- CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
- CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
- CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
- CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
- CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
- CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes
- CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

Explain the difference between spot refinishing, panel refinishing and overall refinishing
Properly use a spray gun
Summarize the different kinds of spray coats
Outline general color coat/clear coat application procedures
Explain the key points to keep in mind when applying multistage finishes
List general rules for painting/refinishing vehicles
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Properly select the right tool for the job
Select the right power tool or piece of equipment for the job
Explain how damage repair estimates are determined
Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation. HP-I
DAM04 Modules 4
TRM01 Modules 3, 6, 7
Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants. HP-I
REF02 Modules 1
REF04 Modules 1
Inspect and identify substrate, type of finish, and surface condition; develop and document a plan for refinishing using a total product system. HP-I
DAM01 Modules 3
REF02 Modules 1
Remove paint finish in accordance with manufacturer's recommendations. HP-I
REF02 Modules 2
Dry or wet sand areas to be refinished. HP-I
REF02 Modules 4
REF03 Modules 2
Featheredge damaged areas to be refinished. HP-I
REF02 Modules 4
Apply suitable metal treatment or primer in accordance with total product systems. HP-I
CPS01 Modules 3
REF02 Modules 4
Mask and protect other areas that will not be refinished. HP-I
REF02 Modules 2
Mix primer, primer-surface, or primer-sealer. HP-I
REF01 Modules 5
REF02 Modules 4
REF03 Modules 4
Apply primer onto surface of repaired area. HP-I REF02 Modules 4
Apply two-component finishing filler to minor surface imperfections. HP-I
STS01 Modules 2
Dry or wet sand area to which primer-surface has been applied. HP-I
REF02 Modules 4
Dry sand area to which two-component finishing filler has been applied. HP-I
STS01 Modules 2
Remove dust from area to be refinished, including cracks or moldings of adjacent areas. HP-I
REF02 Modules 4
REF03 Modules 3, 4
Clean area to be refinished using a final cleaning solution. HP-I
REF03 Modules 3
Remove, with a tack rag, any dust or lint particles from the area to be refinished. HP-I
REF02 Modules 3, 4
REF03 Modules 4
Apply suitable sealer to the area being refinished when sealing is needed or desirable. HP-I
REF03 Modules 4
Scuff sand to remove nibs or imperfections from a sealer. HP-I

Apply stone chip resistant coating. HP-I

CPS01 Modules 4

REF03 Modules 3

Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas. HP-I

CPS01 Modules 3, 4

REF02 Modules 5

Prepare adjacent panels for blending. HP-I

REF02 Modules 4, 5

Prepare plastic panels for refinishing. HP-I

REF02 Modules

Remediation:

Re-teach major concepts

Review with teacher assistance

Study group

Worksheets

Individual tutoring

Group tutoring

Peer tutoring

Review games

Retest or alternative assessment

Technology integration

Study guides

Computer assisted instruction

Enrichment:

Proceed to next assigned task

Assist another student

Computer research on an approved topic

Individual project work

Safety:

Student must:

Pass safety test with 100% for all tools and equipment

Handle material in a safe and workmanlike manner

Use protective clothing and equipment

Use hand tools in a safe manner

Use adequate ventilation when working in enclosed area

Follow manufacturer's directions when using any product, tool, equipment, etc.

Use proper safety precautions when using /operating hand tools.

Use tools and equipment in a professional work like manner according to OSHA standards

Know and follow the established safety rules at all times

Assessment:

Worksheets

Quizzes

Pre/Post Tests

Time Cards

Writing Activities

Rubrics

Individual Projects

Any content related assessment

Portfolio

SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016). Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago: IL.

SIMS Virtual Paint Sprayer

Hand tools

Spray Booth

Computer

Assorted vehicles

Fire extinguisher

Respirator

Eye Wash Station

Internet websites: ICAR, ASE, SP/2 Safety Training

ICAR Student Discs

Internet resources

Unit Name: PA 1500 – SURFACE PREPARATION

Unit Number: PA1500

Dates: Fall 2019 **Hours:** 60.00

Unit Description/Objectives:

Student will know and be able to repair a surface for refinishing.

Tasks:

PA1501 - Demonstrate proper steps to pre-wash entire vehicle.

PA1502 – Employ the proper use of wax and grease remover.

PA1503 – Demonstrate proper use of sanding and featheredging techniques.

PA1504 - Wet sand and featheredge areas.

PA1505 - Apply suitable metal treatments.

PA1506 - Identify the color of paint on vehicle with use of paint catalogs.

PA1507 - Apply undercoats.

PA1508 – Prepare panels for blending.

PA1509 – Explain the purpose of chip-resistant coating.

PA1510 – Identify masking materials.

PA1511 – Demonstrate masking procedures.

PA1512 – Select the appropriate abrasive.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.

3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.

3.4.10.E7 Evaluate structure design as related to function, considering such factors as style,

- convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.
- CC.3.5.9-10.B. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
- CC.3.5.11-12.B. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Supporting Standards/Anchors

- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to cCC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
complex numbers.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
- CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
- CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
- CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area,

- surface area, circumference, and volume.
- CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.
- CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
- CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Explain the difference between spot refinishing, panel refinishing and overall refinishing
- Properly use a spray gun
- Summarize the different kinds of spray coats
- Outline general colorcoat/clearcoat application procedures
- Explain the key points to keep in mind when applying multistage finishes
- List general rules for painting/refinishing vehicles
- Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
- Select the right power tool or piece of equipment for the job
- Inspect, remove, store, and replace exterior trim and components necessary for proper surface preparation. HP-I
TRM01 Modules 3, 6, 7
- Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants. HP-I
REF02 Modules 1
REF04 Modules 1
- Inspect and identify substrate, type of finish, and surface condition; develop and document a plan for refinishing using a total product system. HP-I
DAM01 Modules 3
REF02 Modules 1
- Remove paint finish in accordance with manufacturer's recommendations. HP-I
REF02 Modules 2
- Dry or wet sand areas to be refinished. HP-I
REF02 Modules 4
REF03 Modules 2
- Featheredge damaged areas to be refinished. HP-I
REF02 Modules 4
- Apply suitable metal treatment or primer in accordance with total product systems. HP-I
CPS01 Modules 3
REF02 Modules 4
- Mask and protect other areas that will not be refinished. HP-I
REF02 Modules 2
- Mix primer, primer-surfacer, or primer-sealer. HP-I
REF01 Modules 5
REF02 Modules 4
REF03 Modules 4

Apply primer onto surface of repaired area. HP-I REF02 Modules 4
Apply two-component finishing filler to minor surface imperfections. HP-I
STS01 Modules 2
Dry or wet sand area to which primer-surface has been applied. HP-I
REF02 Modules 4
Dry sand area to which two-component finishing filler has been applied. HP-I
STS01 Modules 2
Remove dust from area to be refinished, including cracks or moldings of adjacent areas. HP-I
REF02 Modules 4
REF03 Modules 3, 4
Clean area to be refinished using a final cleaning solution. HP-I
REF03 Modules 3
Remove, with a tack rag, any dust or lint particles from the area to be refinished. HP-I
REF02 Modules 3, 4
REF03 Modules 4
Apply suitable sealer to the area being refinished when sealing is needed or desirable. HP-I
REF03 Modules 4
Scuff sand to remove nibs or imperfections from a sealer. HP-I
Apply stone chip resistant coating. HP-I
CPS01 Modules 4
REF03 Modules 3
Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas. HP-I
CPS01 Modules 3, 4
REF02 Modules 5
Prepare adjacent panels for blending. HP-I
REF02 Modules 4, 5
Prepare plastic panels for refinishing. HP-I
REF02 Modules

Remediation:

- Re-teach major concepts
- Review with teacher assistance
- Study group
- Worksheets
- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

Student must:

- Pass safety test with 100% for all tools and equipment
- Handle material in a safe and workmanlike manner
- Use protective clothing and equipment
- Use hand tools in a safe manner
- Use adequate ventilation when working in enclosed area
- Follow manufacturer's directions when using any product, tool, equipment, etc.
- Use proper safety precautions when using /operating hand tools.

Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Quizzes
- Pre/Post Tests
- Time Cards
- Writing Activities
- Rubrics
- Individual Projects
- Any content related assessment
- Portfolio
- SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016). Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

- Hand tools
- Spray Booth
- Computer
- Assorted vehicles
- Fire extinguisher
- Respirator
- Eye Wash Station
- Internet websites: ICAR, ASE, SP/2 Safety Training
- ICAR Student Discs
- Internet resources

Steel Center CTE

Course Name: Collision Repair & Refinishing 2019-20

Unit Name: PA1600 – REFINISHING EQUIPMENT AND PAINT AREA.

Unit Number: PA1600

Dates: Fall 2019 **Hours:** 60.00

Unit Description/Objectives:

Student will know and be able to properly prepare and use the painting environment and mixing area.

Tasks:

PA1601- Prepare and operate the spray booth.

PA1602 – Prepare and use the paint mixing area.

PA1603 - Set up, test and adjust spray guns.

PA1604 - Inspect, clean, and determine conditions of spray guns and equipment.

PA1605 - Select and use the National Institution of Safety and Health (NOISH) approved (Fresh Air Make-up System) personal painting/refinishing respirator system.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

Focus Standard/Anchor #2

- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

Supporting Standards/Anchors

- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
- CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Connecting Standard/Anchor

- CC.3.5.9-10.A. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

Supporting Standards/Anchors

- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Prepare a vehicle for painting/refinishing
- Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
- Evaluate the condition of the vehicle's paint
- Describe methods for removing the damaged paint if needed
- Properly prepare and treat bare metal surfaces

Correctly sand and featheredge surfaces
 Apply an undercoat
 Mask a vehicle properly
 Describe different types of metals used in vehicle construction
 Select the right power tool or piece of equipment for the job
 Soap and water wash entire vehicle; use appropriate cleaner to remove contaminants. HP-I
 REF02 Modules 1
 REF04 Modules 1
 Inspect and identify substrate, type of finish, and surface condition; develop and document a plan for refinishing using a total product system. HP-I
 REF02 Modules 1
 Remove paint finish in accordance with manufacturer's recommendations. HP-I
 REF02 Modules 2
 Dry or wet sand areas to be refinished. HP-I
 REF02 Modules 4
 REF03 Modules 2
 Featheredge damaged areas to be refinished. HP-I
 REF02 Modules 4
 Apply suitable metal treatment or primer in accordance with total product systems. HP-I
 CPS01 Modules 3
 REF02 Modules 4
 Mask and protect other areas that will not be refinished. HP-I
 REF02 Modules 2
 Mix primer, primer-surfacer, or primer-sealer. HP-I
 REF01 Modules 5
 REF02 Modules 4
 REF03 Modules 4
 Apply primer onto surface of repaired area. HP-I
 REF02 Modules 4
 Apply two-component finishing filler to minor surface imperfections. HP-I
 STS01 Modules 2
 Dry or wet sand area to which primer-surface has been applied. HP-I
 REF02 Modules 4
 Dry sand area to which two-component finishing filler has been applied. HP-I
 STS01 Modules 2
 Remove dust from area to be refinished, including cracks or moldings of adjacent areas. HP-I
 REF02 Modules 4
 REF03 Modules 3, 4
 Clean area to be refinished using a final cleaning solution. HP-I
 REF03 Modules 3
 Remove, with a tack rag, any dust or lint particles from the area to be refinished. HP-I
 REF02 Modules 3, 4
 REF03 Modules 4
 Apply suitable sealer to the area being refinished when sealing is needed or desirable. HP-I
 REF03 Modules 4
 Scuff sand to remove nibs or imperfections from a sealer. HP-I
 Apply stone chip resistant coating. HP-I
 CPS01 Modules 4
 REF03 Modules 3
 Restore corrosion-resistant coatings, caulking, and seam sealers to repaired areas. HP-I
 CPS01 Modules 3, 4
 REF02 Modules 5
 Prepare adjacent panels for blending. HP-I
 REF02 Modules 4, 5
 Prepare plastic panels for refinishing. HP-I
 REF02 Modules

Remediation:

- Re-teach major concepts
- Review with teacher assistance
- Study group
- Worksheets
- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

Student must:

- Pass safety test with 100% for all tools and equipment
- Handle material in a safe and workmanlike manner
- Use protective clothing and equipment
- Use hand tools in a safe manner
- Use adequate ventilation when working in enclosed area
- Follow manufacturer's directions when using any product, tool, equipment, etc.
- Use proper safety precautions when using /operating hand tools.
- Use tools and equipment in a professional work like manner according to OSHA standards
- Know and follow the established safety rules at all times

Assessment:

Worksheets	Individual Projects
Quizzes	Any content related assessment
Pre/Post Tests	Portfolio
Time Cards	SP/2 Safety Training web based
Writing Activities	assessment
Rubrics	

Resources/Equipment:

Duffy, J.E.(2016). Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Hand tools

SIMS Virtual Paint Sprayer

Spray Booth
Assorted tool catalogs

Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station

Internet websites: ICAR, ASE, SP/2 Safety
Training
ICAR Student Discs
Internet resources

Unit Name: PA1700 – REFINISHING OPERATIONS.

Unit Number: PA1700

Dates: Fall 2019 **Hours:** 60.00

Unit Description/Objectives:

Student will know and be able to apply various types of finishes.

Tasks:

PA1701 - Prepare surface for topcoat system.

PA1702 - Apply primer-sealer.

PA1703 - Apply single-stage finish.

PA1704 - Apply basecoat/clearcoat finish.

PA1705 – Describe the application of stone chip- resistant coating to lower body areas.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Supporting Standards/Anchors

- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
- CC.3.5.11-12.J. By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.
- CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Describe color theory and how it relates to refinishing
- Define the terms relating to color
- Describe the use of a computerized color matching system
- Make let-down and spray-out test panels
- Explain how to tint solid and metallic colors
- Summarize the repair procedures for multistage finishes
- Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
- Select the right power tool or piece of equipment for the job
- Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
- Mask a vehicle properly
- Determine type and color of paint already on vehicle by manufacturer's vehicle information label. HP-I
DAM01 Modules 4
- REF03 Modules 1
- Shake, stir, reduce, catalyze/activate, and strain paint according to manufacturer's procedures. HP-I
REF03 Modules 4
- Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied. HP-I
REF02 Modules 3

Apply selected product on test and let-down panel in accordance with manufacturer's recommendations; check for color match. HP-I
REF03 Modules 2
Apply single stage topcoat for refinishing. HP-I
REF03 Modules 4
Apply basecoat/clearcoat for panel blending or partial refinishing. HP-I
REF03 Modules 3, 4
Apply basecoat/clearcoat for overall refinishing. HP-G
REF03 Modules 4
Denib, buff, and polish finishes where necessary. HP-I
REF04 Modules 2
Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures. HP-I
REF02 Modules 4
REF03 Modules 3, 4
Refinish rigid, semi-rigid, and flexible plastic parts. HP-G
REF03 Modules 3, 4
Apply multi-stage (tricoat) coats for panel blending or overall refinishing. HP-G REF03 Modules 4
Identify and mix paint using a formula. HP-G
REF01 Modules 5
Identify poor hiding colors, determine necessary action. HP-G
REF03 Modules 3
Tint color using formula to achieve a blendable match. HP-G
REF03 Modules 5
Identify alternative color formula to achieve a blendable match. HP-G
REF03 Modules 2

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Quizzes
- Pre/Post Tests
- Time Cards
- Writing Activities
- Rubrics
- Individual Projects
- Any content related assessment
- Portfolio
- SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016). Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

SIMS Virtual Paint Sprayer

Hand tools

Spray Booth

Computer

Assorted vehicles

Fire extinguisher

Respirator

Eye Wash Station

Internet websites: ICAR, ASE, SP/2 Safety Training

ICAR Student Discs

Internet resources



Unit Name: PA1800 – BLENDING OPERATIONS

Unit Number: PA1800

Dates: Fall 2019 **Hours:** 47.00

Unit Description/Objectives:

Student will know and be able to prepare and blend base/clear coat finishes.

Tasks:

PA1801 - Prepare an area for blending of the finish.

PA1802 - Blend basecoat/clearcoat finish.

PA1803 - Tint and blend color coat

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Supporting Standards/Anchors

- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when

reporting quantities.

CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.

CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.

CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.

CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.

CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects

Skill:

Describe color theory and how it relates to refinishing
Define the terms relating to color
Describe the use of a computerized color matching system
Make let-down and spray-out test panels
Explain how to tint solid and metallic colors
Summarize the repair procedures for multistage finishes
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Select the right power tool or piece of equipment for the job
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Mask a vehicle properly
Explain how damage repair estimates are determined
Identify and explain the most common abbreviations used in collision estimating guides
Determine type and color of paint already on vehicle by manufacturer's vehicle information label. HP-I
REF03 Modules 1
Shake, stir, reduce, catalyze/activate, and strain paint according to manufacturer's procedures. HP-I
REF03 Modules 4

Apply finish using appropriate spray techniques (gun arc, gun angle, gun distance, gun speed, and spray pattern overlap) for the finish being applied. HP-I

REF02 Modules 3

Apply selected product on test and let-down panel in accordance with manufacturer's recommendations; check for color match. HP-I

REF03 Modules 2

Apply single stage topcoat for refinishing. HP-I

REF03 Modules 4

Apply basecoat/clearcoat for panel blending or partial refinishing. HP-I

REF03 Modules 3, 4

Apply basecoat/clearcoat for overall refinishing. HP-G

REF03 Modules 4

Denib, buff, and polish finishes where necessary. HP-I

REF04 Modules 2

Identify the types of rigid, semi-rigid or flexible plastic parts to be refinished; determine the materials, preparation, and refinishing procedures. HP-I

REF02 Modules 4

REF03 Modules 3, 4

Refinish rigid, semi-rigid, and flexible plastic parts. HP-G

REF03 Modules 3, 4

Apply multi-stage (tricoat) coats for panel blending or overall refinishing.

HP-G REF03 Modules 4

Identify and mix paint using a formula. HP-G

REF01 Modules 5

Identify poor hiding colors, determine necessary action. HP-G

REF03 Modules 3

Tint color using formula to achieve a blendable match. HP-G

REF03 Modules 5

Identify alternative color formula to achieve a blendable match. HP-G

REF03 Modules 2

Remediation:

- Re-teach major concepts
- Review with teacher assistance
- Study group
- Worksheets
- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

- Student must:
 - Pass safety test with 100% for all tools and equipment
 - Handle material in a safe and workmanlike manner
 - Use protective clothing and equipment
 - Use hand tools in a safe manner
 - Use adequate ventilation when working in enclosed area

Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016). Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

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Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

SIMS Virtual Paint Sprayer
Hand tools
Spray Booth
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Steel Center CTE

Course Name: Collision Repair & Refinishing 2019-20

Unit Name: PA1900 - DETAILING

Unit Number: PA1900

Dates: Fall 2019 **Hours:** 60.00

Unit Description/Objectives:

Student will know and be able to completely detail a vehicle.

Tasks:

PA1901 - Remove overspray.

PA1902 - Clean exterior of vehicle.

PA1903 - Clean interior of vehicle.

PA1904 - Apply decals and stripes.

PA1905 - Demonstrate wet sand and polishing techniques.

PA1906 - Clean body openings.

PA1907 - Clean exterior and interior glass surfaces.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- CC.3.6.11-12.B. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Focus Standard/Anchor #2

- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Supporting Standards/Anchors

CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.

Instructional Activities:

Knowledge:

Complete Objective Worksheet for each assigned module
Participate in theory presentation and respond to questions
Complete vocabulary activities
Participate in group activities as directed
Take notes during theory presentation and maintain a notebook
Complete daily task sheet recording day's activities and work
Complete assigned worksheets
Complete assigned reading
Participate in class discussions
Maintain student portfolio of assignments and notes
Demonstrate safe use of tools
Complete assigned individual projects
Properly remove and install vinyl decals and striping
Prepare the surface before applying adhesive overlay material or before custom painting
Explain various techniques for doing custom paint work
Remove, align, and install molding and emblems

Skill:

Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Select the right power tool or piece of equipment for the job
Mask a vehicle properly

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration

Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics
Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016). Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

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Hand tools
Assorted tool catalogs
Computer
Assorted vehicles
Fire extinguisher
Respirator
Eye Wash Station
Internet websites: ICAR, ASE, SP/2 Safety Training
ICAR Student Discs
Internet resources

Unit Name: PA2000 - ESTIMATING ANALYZING DAMAGE

Unit Number: PA2000

Dates: Fall 2019 **Hours:** 60.00

Unit Description/Objectives:

Student will know and be able to identify different types of vehicle damage.

Tasks:

PA2001 - Identify vehicle by Vin (vehicle identification number)

PA2002 - Collect vehicle and customer data.

PA2003 - Demonstrate usage of collision estimating guides.

PA2004 - Identify different types of vehicle damage.

PA2005 - Indicate repair and replace decisions.

PA2405 - Prepare an estimate/repair sequence

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience

Supporting Standards/Anchors

- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.3.6.11-12.H. Draw evidence from informational texts to support analysis, reflection, and research
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
- CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
- CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
- CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
- CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
- CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
- CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
- CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- Explain how damage repair estimates are determined
- Identify and explain the most common abbreviations used in collision estimating guides
- Make a rough estimate of the time required to refinish a given collision repair job
- Explain the difference between direct and indirect damage and locate both types
- Identify the key operating features of manual and computerized estimating systems
- Compare manual and computerized estimating
- Describe different types of metals used in vehicle construction
- Summarize the deformation effects of impacts on steel
- Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
- Explain how damage repair estimates are determined
- Select the right power tool or piece of equipment for the job
- Mask a vehicle properly

Remediation:

- Re-teach major concepts
- Review with teacher assistance
- Study group
- Worksheets
- Individual tutoring
- Group tutoring
- Peer tutoring
- Review games
- Retest or alternative assessment
- Technology integration
- Study guides
- Computer assisted instruction

Enrichment:

- Proceed to next assigned task
- Assist another student
- Computer research on an approved topic
- Individual project work

Safety:

- Student must:
- Pass safety test with 100% for all tools and equipment
- Handle material in a safe and workmanlike manner
- Use protective clothing and equipment
- Use hand tools in a safe manner
- Use adequate ventilation when working in enclosed area
- Follow manufacturer's directions when using any product, tool, equipment, etc.
- Use proper safety precautions when using /operating hand tools.
- Use tools and equipment in a professional work like manner according to OSHA standards
- Know and follow the established safety rules at all times

Assessment:

- Worksheets
- Quizzes
- Pre/Post Tests
- Time Cards
- Writing Activities
- Rubrics
- Individual Projects
- Any content related assessment
- Portfolio
- SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016). Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Auto Body Repair Technology 6th edition. Clifton Park: NY: Thomson Delmar Learning.

Inter-Industry Conference On Auto Collision Repair. I-CAR Advance Delivery Curriculum. Chicago:IL.

Hand tools

Computer

Assorted vehicles

Fire extinguisher

Respirator

Eye Wash Station

Internet websites: ICAR, ASE, SP/2 Safety Training

ICAR Student Discs

Internet resources



Steel Center CTE

Course Name: Collision Repair & Refinishing 2019-20

Unit Name: PA2100 - PLASTIC REPAIR

Unit Number: PA2600

Dates: Fall 2019 **Hours:** 60.00

Unit Description/Objectives:

Student will know and be able to identify plastic and perform tests to make repair decisions.

Tasks:

PA2101 - Identify plastic and perform tests to make repair decisions.

PA2102 – Demonstrate plastic repair methods (adhesives and welding).

PA2103 – Repair plastics with two-part adhesives, with and without reinforcement.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

Supporting Standards/Anchors

- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
- CC.3.5.11-12.C. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
- CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
- CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
- CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

- List typical plastics and composite applications in vehicle construction
- Identify automotive plastics through the use of international symbols (ISO codes) and by making a trial-and-error weld
- Describe the basic differences between welding metal and welding plastic
- Outline the basics of hot-air and airless welding
- Repair interior and unreinforced hard plastics
- Perform two-part adhesive repairs

Repair RRIM and other reinforced plastics
Describe different types of metals used in vehicle construction
Properly clean a vehicle using soap, water, air pressure, and a wax-grease remover
Select the right power tool or piece of equipment for the job
Mask a vehicle properly
Identify and explain the most common abbreviations used in collision estimating guides
Identify the types of plastics; determine repairability. HP-I
DAM02 Modules 2 PLA01 Modules 1, 3 PLA02 Modules 1, 4
Identify the types of plastics repair procedures; clean and prepare the surface of plastic parts. HP-I
PLA01 Modules 1, 2 PLA02 Modules 1, 2
Replace or repair rigid, semi-rigid, and flexible plastic panels according to
manufacturer's/industry specifications. HP-G
EXT01 Modules 1, 2, 3, 4, 5, 6 EXT02 Modules 2, 3, 4 PLA01 Modules 2 PLA02 Modules 2, 3
Remove or repair damaged areas from rigid exterior sheet-molded compound (SMC) panels. HP-G
EXT02 Modules 2 PLA02 Modules 3
Replace bonded sheet-molded compound (SMC) body panels; straighten or align panel supports. HP-G
EXT02 Modules 2

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:
Pass all required S/P2 certification.
Pass safety test with 100% for all tools and equipment
Handle material in a safe and workmanlike manner
Use protective clothing and equipment
Use hand tools in a safe manner
Use adequate ventilation when working in enclosed area
Follow manufacturer's directions when using any product, tool, equipment, etc.
Use proper safety precautions when using /operating hand tools.
Use tools and equipment in a professional work like manner according to OSHA standards
Know and follow the established safety rules at all times

Assessment:

Worksheets
Quizzes
Pre/Post Tests
Time Cards
Writing Activities
Rubrics

Individual Projects
Any content related assessment
Portfolio
SP/2 Safety Training web based assessment

Resources/Equipment:

Duffy, J.E.(2016).Auto Body Repair Technology. Clifton Park: NY: Thomson Delmar Learning.

Duffy, J.E., Uhrina P. (2016). Student Workbook and Activity Guide to Accompany Auto Body Repair Technology. Clifton Park: NY: Thomson Delmar Learning.

Magee, R. (2016). Instructor's Manual to Accompany Auto Body Repair Technology. Clifton Park: NY: Thomson Delmar Learning.

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Hand tools
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ICAR Student Discs
Internet resources

Steel Center CTE

Course Name: Collision Repair & Refinishing 2019-20

Unit Name: PA2200 - RESTRAINT SYSTEMS

Unit Number: PA2200

Dates: Fall 2019 **Hours:** 40.00

Unit Description/Objectives:

Student will know and be able to identify, inspect, and disarm supplemental restraint systems.

Tasks:

PA2201 - Research auto manufacturers' recommended safety procedures to prevent accidental deployment of supplemental restraint systems.

PA2202 - Identify, inspect, and disarm supplemental restraint systems.

PA2203 - Remove and reinstall seatbelt components.

Standards / Assessment Anchors

Focus Standard/Anchor #1

- 13.2.11 E Demonstrate, in the career acquisition process, the application of essential workplace skills/knowledge, such as, but not limited to: commitment, communication, dependability, health/safety, laws and regulations (that is Americans with Disabilities Act, Child Labor Law, Fair Labor Standards Act, OSHA, Material Safety Data Sheets), personal initiative, Self-advocacy, scheduling/time management, team building, technical literacy and technology.

Supporting Standards/Anchors

- 3.4.10.A2 Interpret how systems thinking applies logic and creativity with appropriate comprises in complex real-life problems.
- 3.4.10.D2 Diagnose a malfunctioning system and use tools, materials, and knowledge to repair it.
- 3.4.10.E7 Evaluate structure design as related to function, considering such factors as style, convenience, safety, and efficiency.
- 3.2.12.B1 Analyze the principles of rotational motion to solve problems relating to angular momentum and torque.
- 3.4.12.B1 Analyze ethical, social, economic, and cultural considerations as related to the development, selection, and use of technologies.
- 3.4.12.C3 Apply the concept that many technological problems require a multi-disciplinary approach.
- 3.4.12.E5 Explain how the design of intelligent and non-intelligent transportation systems depends on many processes and innovative techniques.
- 3.4.12.E7 Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

Focus Standard/Anchor #2

- CC.3.6.11-12.F. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Supporting Standards/Anchors

- CC.2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
- CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
- CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- CC.2.1.HS.F.6 Extend the knowledge of arithmetic operations and apply to complex numbers.
- CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
- CC.2.3.HS.A.13 Analyze relationships between two-dimensional and three-dimensional objects.
- CC.2.3.HS.A.7 Apply trigonometric ratios to solve problems involving right triangles.
- CC.3.6.11-12.C. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience
- CC.3.5.9-10.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
- CC.3.5.11-12.D. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

Connecting Standard/Anchor

- CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Supporting Standards/Anchors

- CC.2.4.5.A.1 Solve problems using conversions within a given measurement system.
- CC.2.1.6.E.2 Identify and choose appropriate processes to compute fluently with multi-digit numbers.
- CC.2.1.6.E.4 Apply and extend previous understandings of numbers to the system of rational numbers.
- CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
- CC.2.3.6.A.1 Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.
- CC.2.3.7.A.1 Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume.
- CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

Instructional Activities:

Knowledge:

- Complete Objective Worksheet for each assigned module
- Participate in theory presentation and respond to questions
- Complete vocabulary activities
- Participate in group activities as directed
- Take notes during theory presentation and maintain a notebook
- Complete daily task sheet recording day's activities and work
- Complete assigned worksheets
- Complete assigned reading
- Participate in class discussions
- Maintain student portfolio of assignments and notes
- Demonstrate safe use of tools
- Complete assigned individual projects

Skill:

Explain the difference between an active and a passive restraint system
Learn how to service seat belts
Describe the operation of air bag systems
Repair air bag systems safely
Explain the difference between an active and a passive restraint system
Learn how to service seat belts
Describe the operation of air bag systems
Repair air bag systems safely
Disarm SRS in accordance with manufacturer's specifications/procedures. HP-I
RES01 Modules 1
Inspect, remove, and replace sensors and wiring in accordance with manufacturer's specifications/procedures; ensure sensor orientation. HP-G
DAM04 Modules 1
RES01 Modules 1
Inspect, remove, replace, and dispose of deployed SRS modules in accordance with manufacturer's specifications/procedures. HP-G
DAM04 Modules 1
RES01 Modules 1
Verify that SRS is operational in accordance with manufacturer's specifications/procedures. HP-I
RES01 Modules 2
Inspect, remove, replace, and dispose of non-deployed SRS in accordance with manufacturer's specifications/procedures. HP-G
RES01 Modules 1
Diagnose and repair SRS using fault codes and test equipment. HP-G
RES01 Modules
Inspect, remove, and replace seatbelt and shoulder harness assembly and components in accordance with manufacturer's specifications/procedures. HP-G
DAM04 Modules 1
RES01 Modules 3, 4
Inspect restraint system mounting areas for damage; repair in accordance with manufacturer's specifications/procedures. HP-G
DAM04 Modules 1
RES01 Modules 3
Verify proper operation of seatbelt in accordance with manufacturer's specifications/procedures. HP-G
RES01 Modules 3

Remediation:

Re-teach major concepts
Review with teacher assistance
Study group
Worksheets
Individual tutoring
Group tutoring
Peer tutoring
Review games
Retest or alternative assessment
Technology integration
Study guides
Computer assisted instruction

Enrichment:

Proceed to next assigned task
Assist another student
Computer research on an approved topic
Individual project work

Safety:

Student must:

Pass safety test with 100% for all tools and equipment

Handle material in a safe and workmanlike manner

Use protective clothing and equipment

Use hand tools in a safe manner

Use adequate ventilation when working in enclosed area

Follow manufacturer's directions when using any product, tool, equipment, etc.

Use proper safety precautions when using /operating hand tools.

Use tools and equipment in a professional work like manner according to OSHA standards

Know and follow the established safety rules at all times

Assessment:

Worksheets

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Pre/Post Tests

Time Cards

Writing Activities

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Individual Projects

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Portfolio

SP/2 Safety Training web based assessment

Resources/Equipment:

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