

AB 52 Structural Repair and AB 58 Collision Repair Update

Tuesday and Thursday 1 to 5 PM AT54 / AT 60
(November 23rd Thanksgiving Holiday; NACE 2006 Oct
31st – November 4th)

Course Syllabus – Spring 2006
***Part 2 of Five-Course Certificate
Program***

New Focus:

- *I-CAR Enhanced-Delivery Modules Embedded*
- *Celette Bench Systems Training Embedded*
- *VeriFacts Automotive – Principles Embedded*

Professor: Charles C. Robertson

Instructor Contact:

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- ITOutsource, Inc. Website: www.itout.net

Office Hours: Mon, Wed, Thur from 5-6pm Office D

For students with learning or other disabilities, please notify instructor so that reasonable accommodations can be made to assist you in your learning experience.

COURSE CONTENT

This course is part of an instructional package for the student who wishes additional knowledge in automotive collision repair. It introduces the student to unitized and space-frame construction, high strength steel components, chassis design, sheet metal straightening techniques, alignment and installation of body parts. Also included is safety related to electrical problems, introduction of plastic components and continued welding and metallurgical experience.

Areas of study:

1. Automotive structural parts identification
2. Structural panel repair and replacement,
3. Auto Collision Repair terminology
4. Auto Collision Repair Tool Identification and use
5. Advanced welding techniques, GMAW (MIG), STRSW, Plasma Cutting
6. Welded panel replacement,
7. Identification of unitized and space-frame construction (internal and external)
8. Straightening techniques used to repair various types of sheet metal
9. Straightening and repair techniques to damaged unitized structural assemblies
10. Straightening and repair techniques to damaged body on frame structures
11. Measuring and gauging of structural damage on various structural designs
 - a. Universal Measuring Systems
 - b. Jig and Fixture Systems – dedicated Bench Systems
 - c. Computerized Measuring Systems
12. Sheet metal alignment and installation of body parts and moveable glass
13. Safety related to electrical problems in automotive collision repair
14. Door skin and intrusion beam replacement
15. Collision Theory and Structural Damage Analysis
16. Student project vehicles welcome for lab work
17. Introduction to repair of plastic components
18. AB 58 students choose their area of update from the above list. Collision Repair Update is designed for enhancement of specific skill sets and improvements in speed and quality of product.

Required materials and tools:

- Basic welding equipment -- gloves, welding goggles, striker, tip cleaner
- Basic hand tools -- 1/4" and 3/8" drive socket set, screwdrivers, pliers, combination wrenches (metric & standard), safety glasses must be worn in shop area at all times.

ASSIGNMENT and TEST POLICY

- Attendance Required at Each Class Period
- The instructor must approve make-up work in advance.
- Highest grades awarded to those who help others learn repair processes after demonstrating proficiency themselves.
- Performance Evaluation and Final Exam Required for Grade Above 'D'

ASSIGNMENTS

NO.	ASSIGNMENT	PERCENT	POINTS
1	Basic Skills Performance Evaluation	18	300
2	Advanced Skills Performance Evaluation	18	300
3	Live Work – Project Evaluations	18	300
4	I-CAR Enhanced-Delivery Modules	12	200
5	Mid Term Exam	3	50
6	Celette Bench Training	12	200
7	Help others learn repair processes	6	100
8	Participation (Minimum 80% of Classes)	9	150
9	FINAL EXAM	6	100
	TOTAL	100%	1700

GRADE DESCRIPTIONS

DESCRIPTION OF PERFORMANCE	PERCENT	GRADE
Performance has been at the <u>highest level</u> , showing sustained excellence in meeting all course requirements & in <u>assisting other students</u> in the learning process.	90-100	A
Performance has been at a <u>high level</u> , showing consistent and effective achievement in meeting course requirements.	80-89	B
Performance has been at an <u>adequate level</u> , meeting the basic requirements of the course.	70-79	C
Performance has been <u>less than adequate</u> , meeting only the minimum course requirements.	60-69	D
Performance has been such that <u>minimal course requirements have not been met</u> .	0-59	F

Additional Learning Resources

Celette Bench Systems Training Modules;

1. Jig and Fixture / Bench setup
2. Structural Corrective Pull Strategies with the Celette Bench System
3. PowerPoint and Video Presentations
4. Live presentations by guest speakers/ trainers/ technicians

I-CAR Enhanced-Delivery Training - Testing Series (16 in all)

Automotive Steel GMA (MIG) Welding Qualification Test Prep	WCS02
Automotive Steel GMA (MIG) Welding Qualification Test	WCS03
Structural Parts Steel Qualification Test Prep	SPS04
Structural Parts Steel Qualification Test	SPS05

DELMAR VIDEO SERIES INDEX: 5 Videos (Review)

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- ACR #1**
- a) **Collision Repair Safety**
 - b) Body Shop Power Tools
 - c) **Vehicle Construction**
- ACR #2**
- a) Metal Straightening Fundamentals
 - b) Collision Repair Materials
 - c) Fiberglass and Plastic Repair
 - d) **Frame and Unibody Repair**
- ACR #3**
- a) Estimating Repair Costs
 - b) **Replacing Structural Parts, Corrosion Protection**
 - c) **Measuring Vehicle Damage**
 - d) Paint Preparation, Masking
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User Access to Delmar Digital Videos:

1. Must have Windows User Account Activated to access Campus Network.
2. Double-click on "Training Mastery" Icon to open Delmar Programs
3. Enter your unique Cerritos College Windows User ID. Student Example: Name is Jose Gonzalez, username given by campus computer system "jgonzalez". Enter this each time to access these videos, use EXACTLY the same user ID, it will ask you to verify your name, if correct click on "accept" – your quiz scores will follow you whenever you log in.
4. Select the Desired Section and Presentation. You must finish each section to receive credit. Stopping in the middle will require retaking the entire topic.
5. You may take a Pre-Test to check your knowledge prior to viewing each video, or you may view the video first, then test afterwards. The system will record both scores under your ID. Print, sign, date and indicate Class # on each. The best scores of each re-test remain.

Campus Network User ID: _____ **Student #:** _____ **New Password:** _____

CELETTE DEDICATED BENCH FIXTURE SETUP OPTIONS:

Description	Total Fixtures	Torque Box	Front Fixture	Rear Fixture	Front Susp Min.	Front Susp Add	Rear Susp Min	Rear Susp Add	Comments:
Minimal Setup	8	4	2	2					R&I : Front Bumper & Absorbers, Rear Bumper & Absorbers, Lower Covers, Rocker Moldings, Exhaust, Core Support,
Minimal Setup Front	16	4	2	2	2	2	2	2	R&I : Front Bumper & Absorbers, Rear Bumper & Absorbers, Lower Covers, Rocker Moldings, Exhaust, Core Support, Front Subframe Bolts(2)
Minimal Setup Rear	16	4	2	2	2	2	2	2	R&I : Front Bumper & Absorbers, Rear Bumper & Absorbers, Lower Covers,Rocker Moldings, Exhaust, Core Support, Rear Subframe Bolts(2)
Modified Setup Front	20	4	2	2	2	6	2	2	R&I : Front Bumper & Absorbers, Rear Bumper & Absorbers, Lower Covers, Rocker Moldings, Exhaust, Core Support, Front Suspension Assemblies from Subframe(2), Front Sway Bar, Front Subframe Bolts(2), Rear Subframe Bolts(2)
Modified Setup Rear	16	4	2	2	4		4		R&I : Front Bumper & Absorbers, Rear Bumper & Absorbers, Lower Covers, Rocker Moldings, Exhaust, Core Support, Rear Suspension and Subfame Assy, Rear Sway Bar(2), Front Subframe Bolts(2)
Full Setup	26	4	4	2	8		8		R&I : Front Bumper & Absorbers, Rear Bumper & Absorbers, Lower Covers, Rocker Moldings, Exhaust, Core Support, Front Suspension Assembly and Subframe(2), Front Sway Bar, Front Subframe Bolts(2), Rear Suspension and Subfame Assy, Rear Sway Bar(2), Drive Shaft, Engine and Trans assembly(1)

Other Needed Operations

Align suspension / Thrust Alignment

Flush and Bleed Brakes

Fill and Purge Cooling System

Recover Refrigerant, Evacuate & Recharge A/C

Install Trans/Oil Cooler Bypass

Purge Hydraulic Suspension System

Adjust Linkages

Pull Back or Remove Wiring

Check and Reset Electronics

(1)Engine Removed or Suspended (with out being supported by the unibody)

(2)Suspension Hardware (Fasteners) Often Times Must Be Replaced if Removed

AUTOMOBILE COMPONENT IDENTIFICATION

UNIT 1 Review

Outer Body Panels- Bolt-On

- Door Assemblies / Skins
- Fenders
- Trunk Lid
- Hood
- Cowl Vent Panels
- Bumpers
- Sunroof Panels
- Filler Panels
- Front / Rear Valance
- Header Panel

Welded & Bonded Panels

- Glass - Fixed & Moveable
- Quarter Panels
- Roof Panel
- Rear Body Panels

UNIT 2 Review

Outer Body Trim

- Moldings
- Emblems
- Name Plates
- Outer Handles & Lock Cylinders
- Striping and Decals
- Lighting and Lamps
- Mirrors

UNIT 3: Inner Structure

- Front Aprons
- Core (Radiator) Support
- A + B + C Pillars
- Rocker Panels
- Floor Pans
- Roof Support Panels
- Package Shelf
- Wheel Houses
- Rear Inner Quarter Panel
- Dash Panels

UNIT 4: Frame / Unibody

- Front Frame Rails
- Cross Members
- Rear Frame Rails
- Shock Towers
- Torque Box
- Core Supports
- Cowl Section

UNIT 5: Mechanical & Suspension

- Engine
- Transmission/ Transaxle
- Suspension Cross Members
- Exhaust System
- McPherson Struts
- Lower Control Arm
- Rack and Pinion Steering
- Steering Box
- Tie Rod Ends
- Sway Bar
- Torsion Bar

UNIT 6: Electrical/ Electronic Components

- Battery
- Alternator
- Regulator
- Coil
- Solenoid
- Relays
- Fuse Block
- Fusible Links
- Computer Module
- Onboard Diagnostics Port
- Wire Harnesses
- Supplemental Restraints
- Fiber Optics
- Intelligent Cruise Controls
- Proximity detectors

TOOL IDENTIFICATION

Hand Tools: Review

- Pick Hammer
- Cross Peen Hammer
- Roughing Hammer
- Universal Dolly
- Slapper
- Springing Spoon
- Large Spoon/ Pry Bar
- Cheese Grater
- Phillips Screwdriver
- Standard Flat Screwdriver
- Plastic Spreader
- 6" Rubber Sanding Block
- Long Board
- Body File
- Slide Hammer
- Morgan Knocker
- Tin Snips
- Locking Pliers (vice grips)
- Side Cutting Pliers
- Needle Nose Pliers
- Body Pick/ Pry Bar
- 4 Ton Porto-Power

Power Tools: Review

- Air Drill
- Wire Wheel of Knotted Const.
- 6" Dual Action Orbital Sander

- 8" DA Sander
- Inline Sander
- 9" Grinder
- 3" Cutt-Off tool
- 3/8" air ratchet
- Bay Lift
- GMAW (MIG) Welder

Power Tools:

- Dent Master
- Spitzenegl Nail-Gun
- Hirane STRSW
- Chief EZ-Liner
- Chief Velocity (Laser)
- Blackhawk Korek
- Power Post (Meise)
- Power Post (Kansas Jack)
- Celette Dedicated Bench
- Air Ratchet 1/4 & 3/8 Inches
- Gravity Spray Guns
- Sand Blaster

Miscellaneous Tools:

- Dimension Guides
- Chain Gauges
- Tram Gauges
- Tape Measure & String Track



VeriFacts Automotive
 Shop Coaching Score Sheet

Coach: _____

Month: _____

Shop:		Location:
Date:	Time In:	Time Out:
Was this a scheduled visit? <input type="checkbox"/> Yes <input type="checkbox"/> No		Was the Manager or Assignee available to review the visit? <input type="checkbox"/> Yes <input type="checkbox"/> No
Manager or Assignee Name (Printed):		Shop Signature:

Quality control card properly filled out? Y / N / 0 _____

Grade on a scale of 1-10 on a percentage level of vehicles observed.

Phase One

Body	Paint	Detail/Done	
_____	XXXXXXXXXXXXXXXXXXXX		1. Proper three-dimensional measuring
_____	XXXXXXXXXXXXXXXXXXXX		2. Restore vehicle dimensions
_____	XXXXXXXXXXXXXXXXXXXX		3. Drill/grind spot welds
_____	XXXXXXXXXXXXXXXXXXXX		4. Proper panel removal
_____	XXXXXXXXXX		5. Proper preservation of factory e-coat
_____	XXXXXXXXXXXXXXXXXXXX		6. Proper grind of weld nugget after panel removed
_____	XXXXXXXXXXXXXXXXXXXX		7. Proper application of corrosion protection primer (e.g., epoxy, PM13, weld-through primer)
_____	XXXXXXXXXXXXXXXXXXXX		8. Proper mating surface and structure preparation
_____			9. Proper welded joint fit up
_____			10. Proper and complete welds
_____	XXXXXXXXXX		11. Proper application of epoxy or appropriate non-acid, bare metal primer before seam sealer
_____			12. Proper application of seam sealer and corrosion protection

Phase Two

_____			13. Weld count and spacing
_____			14. Appropriate repair methodology
_____			15. Exterior/underhood/inner structure color match and complete
_____			16. Complete structural repair
_____			17. Touch-up of bolt and screw heads that were worked. Proper bolts, screws and fasteners installed.
_____			18. Vehicle interior protection (parts in cars, openings covered, etc.)
_____			19. Battery disconnected & fluid lines capped off when appropriate
_____			20. Shop general area cleanliness

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Please fax to 888-622-6905.

Last Update: August 2005

RIDE-ALONG ASSIGNMENT

VeriFacts Coaching Visit

Name: _____

Date: ___/___/___

Coach: _____

Shop Name: _____

Manager Name: _____

Class: **AB 52 Structural Repair**

CREDIT / NO CREDIT
(determined by instructor)

(use this page as a cover sheet)

RIDE-ALONG ASSIGNMENT

NAME: _____ **DATE:** ___/___/___ **TIME:** __:___

DESTINATION:

PURPOSE OF THE FIELD TRIP:

Observe and tour a collision repair facility, observe typical daily operations, observe coaching aspects of VeriFacts visit, identify critical areas of repair, determine how a damage estimator or appraiser could improve repair process for technicians. Develop additional experience observing heavily damaged vehicles in process of repair.

QUESTIONS TO ASK DURING RIDE-ALONG (make the list prior to ride-along):

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Use the “M.A.D.E.” Format For Written Communication:

Write a one or two page essay on 2 or 3 important observations made from your ride-along that focus on the theme “**How my perspective on the Collision Repair Industry has changed as a result of this activity**”. Follow the “M.A.D.E” format below.

Message: a brief summary statement of your main **message** .

Action: describe the **action** you would take as a result of this experience.

Detail: give any **detail** related to the message and action described above. (the who, what, when, where, why, how, and how much of the message)

Evidence: attach any supporting **evidence** to your document. (brochure, bus. card)

PERFORMANCE TEST – BASIC SKILLS

PROCEDURE: 1 A2 METAL STRAIGHTENING AND USE OF BODY FILLER

1. This performance exam is designed to test your ability to follow established procedures

Directions to Students: straighten sheet metal damage, properly prepare it for two-part plastic filler, mix and apply plastic body filler, rough block and finish sand the filler to proper contour and prepare the panel for the paint preparation. It is also the intent of this performance exam to determine your ability to exercise SAFETY PRACTICES in a work environment and to properly use the tools identified for this process to properly repair a damaged panel within industry time and quality standards.

2. This is a timed event. When instructed to do so, gather the appropriate materials, tools and the damaged panel to be repaired and begin the repair process -- following the established procedures demonstrated by the instructor.

3. The following includes two lists identifying the Materials and Tools to be Used, and Standards to be Met for this exam.

MATERIALS AND TOOLS TO BE USED	STANDARDS TO BE MET
1. Roughing Hammer	1. Sheet metal roughed out to approximate original contour prior to next steps
2. Pick Hammer	2. Pick up small indentations using pick hammer, pry bar or spoon without stretching metal beyond normal elasticity
3. Body File	3. Use bare hand to determine remaining high or low spots -- then repair them
4. Universal Dolly	4. Safely and properly use a 9" air grinder with 24 grit disk to prepare panel for plastic filler application
5. Spoon	5. Properly mix and apply two-part body filler to prepared area of damaged panel without debris or "hot" spots or unmixed material
6. 9" Grinder with 24 grit open coat disk	6. When sufficiently cured, block sand the filler to proper contour and shape
7. Rubber sanding block	7. Upon reaching proper shape and contour, finish sand the filler with finer grit paper.
8. Sheet 36 or 40 grit long board paper	8. Properly feather edge the paint edge around the repaired area - preparing for paint prep
9. Sheet of 80 or 100 grit long board paper	9. Examine the final product -- assuring match to industry standards as discussed in class
10. Orbital DA Sander with 80 grit sandpaper	10. Make any final corrections to repair
11. Cheese Grater	11. Demonstrate proper SAFETY Practices

DESCRIPTION OF PERFORMANCE	POINTS	GRADE
Performance has been at the <u>highest level</u> , showing sustained excellence in meeting all course requirements & exhibiting an unusual degree of intellectual initiative.	90-100	A
Performance has been at a <u>high level</u> , showing consistent and effective achievement in meeting task requirements.	80-89	B
Performance has been at an <u>adequate level</u> , meeting the basic requirements of the task.	70-79	C
Performance has been <u>less than adequate</u> , meeting only the minimum task requirements.	60-69	D
Performance has been such that <u>minimal task requirements have not been met</u> .	0-59	F

LAB SHEET 1-A2 -- AB 53 Steering, Suspension, Drivetrain Alignment: Basic Skills Performance Evaluation

PERFORMANCE RATING SHEET

Student Name: _____ **Date:** ___/___/___

Start Time: ___:___ **End Time:** ___:___ **TOTAL TIME:** _____ min. **STANDARD: 60 min.**

Rated by: _____ **SCORE:** _____ **GRADE:** _____

PROCEDURE: 1 A2 METAL STRAIGHTENING AND USE OF BODY FILLER

	TASKS BEING EVALUATED	✓= PASS	POINTS POSSIBLE	SCORE
1	Gather all tools and materials needed to provide the proper repair.		5	
2	Rough-out the damaged area, bringing the panel roughly into original shape and dimension. Use roughing hammer, prying tools, spoons, dolly etc.		5	
3	Pick-up the low spots in the sheet metal using a pick hammer, spoon, pry bar etc.		5	
4	Take care not to stretch the metal beyond its normal elasticity.		5	
5	Feel the damaged area with the flat palm and fingers of the hand noticing any excessive high or low spots, correcting them as you evaluate the condition of the panel.		5	
6	Using a 9" air grinder with a 24 grit open-coat grinding disk, remove the paint from the repair area and provide clean, rough texture for the body filler to adhere to.		5	
7	Mix an appropriate amount of body filler with the provided hardener.		5	
8	Homogenize the filler to be of one smooth color and consistency, no lumps, debris or streaks of dark or light colors.		5	
9	Using a putty knife or spreader, apply the filler over the repair area, using a "squeegee" type of motion in order to remove any air bubbles and to provide for improved adhesion to the bare metal. Provide an excess amount of filler in order to eliminate any low spots when sanding.		5	
10	Once the filler is cured, use sanding block (or power sander) with a coarse abrasive (36 to 40 grit), cut down the finish to original contour and shape.		5	
11	Upon proper rough block sanding providing contour and shape, use a similar procedure as in step 10, but now switch to a finer grit sandpaper. (80 to 100 grit).		7	
12	When the finish is block sanded to 80 to 100 grit, and it has the appropriate shape and contour, use a DA orbital sander with 80 to 100 grit and featheredge the broken edge of paint, blending it to an undetectable edge with the bare metal surrounding the sanded body filler.		8	
13	Clean all repair residue from the vehicle or panel and provide a final inspection of the repair area, noting any excessive sand scratches or pinholes and confirm that the repair area now conforms to pre-accident shape and contour.		15	
14	Demonstrate appropriate SAFETY PRACTICES throughout		20	
TOTAL			100	

Any items not marked ✓ must be repeated until a PASS condition is reached