

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: GENERAL REPAIRS I  
\_\_\_\_\_

CODE NO: ASR104  
\_\_\_\_\_

SEMESTER: I  
\_\_\_\_\_

PROGRAM: AIRCRAFT STRUCTURAL REPAIR TECHNICIAN  
\_\_\_\_\_

AUTHOR: STEVE LACHOWSKY  
\_\_\_\_\_

DATE: FALL 1993  
\_\_\_\_\_

PREVIOUS OUTLINE DATED: FALL 1992  
\_\_\_\_\_

APPROVED: LP Choquette  
Dean, School of Engineering Tech.

94-02-02  
Date

COURSE NAME: GENERAL REPAIRS I

CODE NO. ASR104

TOTAL CREDIT HOURS: 150 Hours (10 credits)

PREREQUISITE(S):

**I. PHILOSOPHY/GOALS:**

Students will research using textbooks, the procedures used to perform basic aircraft repairs. Sheetmetal layout work and specialized repairs using formulas for bend allowance will be covered, processes such as countersinking, dimpling, and micro-shaving will be discussed and presented using hand tools. Students will perform basic repairs using sheetmetal of various thicknesses and solid shank rivets.

**II. STUDENT PERFORMANCE OBJECTIVES:**

Upon successful completion of this course the student will:

Describe the proper repair procedures for basic aircraft repairs. Demonstrate current repair layout procedures. Discuss sheetmetal bending and rolling. Successfully complete all practical assignments.

**III. TOPICS TO BE COVERED:**

1. Basic Sheetmetal Layout and Repairs
2. Solid Shank Rivets
3. Specialized Repairs and Processes

COURSE NAME: GENERAL REPAIRS I

CODE NO.: ASR104

**IV. LEARNING ACTIVITIES**

**1.0 Basic Sheetmetal Layout and Repair**

Upon successful completion of this unit the student will be able to:

- 1.1 Identify two most common type of rivets used.
- 1.2 Discuss the various terms associated with rivet layout procedures such as pitch, and edge distance.
- 1.3 Discuss the minimum and maximum pitch for various rivet head styles.
- 1.4 Describe using formulas, charts and structural repair manuals, the proper number of rivets to be used for a repair.
- 1.5 Discuss factors affecting rivet layout results.
- 1.6 Layout a basic sheetmetal repair given minimum information.
- 1.7 Describe how to layout various rivet patterns for rectangular and circular repairs.
- 1.8 Identify the equipment used to perform accurate layout repairs.

**2.0 Solid Shank Rivets**

Upon successful completion of this unit the student will be able to:

- 2.1 Identify common solid shank rivets using codes and rivet head identification marks (i.e.) AN470 AD-3-4 rivet.
- 2.2 Describe how to determine the proper length of rivet shank for a specific repair.
- 2.3 Describe and requisition proper rivet sizes from stores for a repair.

**REQUIRED RESOURCES**

Textbook: A/C 65-15A  
Chapter V, pg. 151 to 154

Textbook: Aircraft Sheetmetal  
EA-SM  
Chapter VII, pg. 78 to 79

Textbook: A/C 65-15A  
Chapter V, pg. 164-175

Textbook: Aircraft Sheetmetal  
EA-SM  
Chapter IV, pg. 27 to 39.

COURSE NAME: GENERAL REPAIRS I

CODE NO.: ASR104

**LEARNING ACTIVITIES**

- 2.4 Discuss how to operate various hand tools used to install solid shank rivets.
- 2.5 Discuss how to install solid shank rivets properly.
- 2.6 Identify a properly installed rivet.
- 2.7 Describe various terms used in rivet installation such as "drawing" and skip riveting.
- 2.8 Identify how to remove rivets properly using proper drill bit sizes and equipment.
- 2.9 Identify the purpose of clecos and the various colours associated with cleco sizes.
- 2.10 Discuss the advantages of using rivets instead of aircraft hardware.
- 2.11 Determine proper bucking bar sizes and rivet gun sizes for a specific repair.
- 2.12 Discuss proper maintenance of hand tools.
- 2.13 Describe the purpose of using rivet squeezers and hole duplicator tools.
- 2.14 Identify the purpose of deburring sheetmetal holes after drilling operations.
- 2.15 Discuss how to protect aluminum from corrosion.
- 2.16 Discuss the causes of poorly installed rivets.
- 2.17 Determine which rivets require heat treating prior to installation.
- 2.18 Identify areas where stainless steel rivets must be used.

**REQUIRED RESOURCES**

Textbook: A/C 65-15A  
Chapter V, pg. 164-175

Textbook: Aircraft Sheetmetal  
EA-SM  
Chapter IV, pg. 27 to 39.

COURSE NAME: GENERAL REPAIRS I

CODE NO.: ASR104

**LEARNING ACTIVITIES**

3.0 **Specialized Repairs and Processes**

Upon successful completion of this unit the student will be able to:

- 3.1 Describe two methods of countersinking aircraft sheetmetal.
- 3.2 Determine which method should be used for a specific repair.
- 3.3 Describe the types of CSK drill bits used for repair.
- 3.4 Identify when the dimpling process should be used.
- 3.5 Describe various ways of dimpling aircraft skins.
- 3.6 Discuss both "Radius" and Coin Dimpling processes.
- 3.7 Discuss micro-shaving process.
- 3.8 Describe how to calculate straight bends on aircraft repairs.
- 3.9 Identify terms such as "sight line, radius and nose radius bar" used in straight bend repairs.
- 3.10 Identify the term "setback".
- 3.11 Identify the machinery used to roll metal and bend aluminum sheets.
- 3.12 Describe how to use and adjust machinery for the purpose of performing straight bends or curved repairs.
- 3.13 Identify machinery used to shear aluminum such as the manual and electric shears.
- 3.14 Discuss the safety features and precautions of band saw operation.
- 3.15 Fabricate both straight bend repairs and curved item repairs as per sample item.

**REQUIRED RESOURCES**

Textbook: A/C 65-15A  
Chapter V, pg. 133-148

Textbook: Aircraft Sheetmetal  
EA-SM  
Chapter VI, pg. 63 to 71.

Textbook: A/C 65-15A  
Chapter V, pg. 141-145

Textbook: Aircraft Sheetmetal  
EA-SM  
Chapter IV, pg. 16 to 18.

COURSE NAME: GENERAL REPAIRS I

---

CODE NO.: ASR104

---

**LEARNING ACTIVITIES**

- 3.16 Identify general repairs on structural members.
- 3.17 Describe the installation and removal of special fasteners and Blind Rivets.

**REQUIRED RESOURCES**

**V. EVALUATION METHODS: (INCLUDES ASSIGNMENTS, ATTENDANCE REQUIREMENTS ETC.)**

Written Tests (5)

Solid Shank Rivets - 20%  
Countersink and Dimpling - 20%  
General Repairs - 20%  
Special Fasteners and Blind Rivets - 20%  
Straight Bend Forming - 20%

TOTAL - 100%

The grading will be as follows:

A = 90% - 100%  
B = 80% - 89%  
C = 70% - 79%  
I = Incomplete

**VI. REQUIRED STUDENT RESOURCES**

Teacher handouts  
A & P Airframe textbook - A/C 65-15A  
A & P General textbook - A/C 65-9A  
Aircraft Sheetmetal Handbook - EA-SM  
Standard AN Hardware Handbook - EA-282-0

**VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY:**

Book Section (title, publisher, edition, date, library call number if applicable - see attached example)

Periodical Section (Magazines, Articles)

D.O.T. Service Bulletins and Airworthiness Directives

Audiovisual Section (Films, Filmstrips, Transparencies)

1. Making Sheetmetal Repairs.
2. Removing Rivets
3. Installing Rivets
4. Dimpling and Countersinking

(All U.S. Army films)

Sheetmetal Layout and Repairs as per A/C 65-15A  
Solid Shank Rivets as per A/C 65-15A & EA-SM  
Specialized Repairs and Processes - EA-SM

### VIII. SPECIAL NOTES

Students with special needs (eg. physical limitation, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of the students.