

LEVEL 3

SHEETMETAL

Training



ACRATS

DETAILED COURSE OUTLINE ATS2133

AIRCRAFT METALLIC STRUCTURE: MANUFACTURING, ASSEMBLY, INSPECTION, DAMAGE ASSESSMENT AND REPAIR LEVEL 3



Course Title

Aircraft Metallic

Structure: Manufacturing, Assembly, Inspection, Damage Assessment and Repair, Level 3



Course Tag

Sheetmetal Level 3



Course ID

ATS2133



Course Duration

15 Working Days



Prerequisites

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Aircraft Metallic

Structure: Manufacturing, Assembly, Inspection, Damage Assessment and Repair *Level 2* (or similar)



Learning Hours

Classroom: 18 Hours
Practical 102 Hours



Highest Standards

Meets EASA, FAA and OEM SRM Standards



Scope and Purpose

The Level 3 Aircraft Sheetmetal Training Course builds on foundational and intermediate skills, providing advanced knowledge and practical expertise in aircraft sheet metal maintenance and repair. This course is designed to deepen participants' understanding of complex repair procedures, ensuring they can perform detailed tasks with precision and follow strict industry standards. Participants will engage in hands-on training, practical exercises, and detailed theoretical lessons covering various aspects of aircraft maintenance, from damage assessment to advanced repair techniques, including dent and buckle inspections.



Course Module Overview

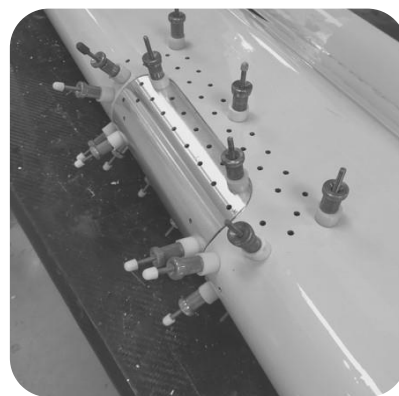
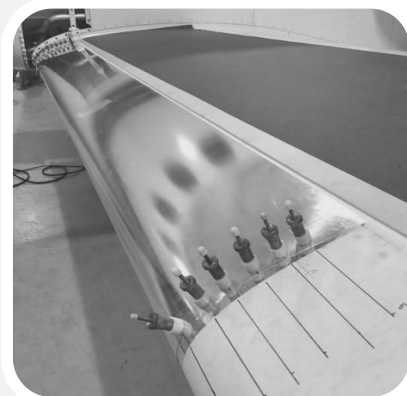
- Introduction
- Metallic Materials (Part 2)
- Metal Forming and Machining Operations (Part 3)
- Structural Repair (Part 3)
- Enclosed Leading Edge Flush Repair
- Skin Replacement
- Circumferential Butt Joint – External Skin Repair
- Source Documentation (Part 3)
- Inspection and Damage Assessment (Part 2)
- Dent & Buckle Inspection
- Forward/Aft Cargo Door Surround Edge Repair
- Sealant Application, Removal, and Repair (Fuel Tank)
- Rotary Flap Peening of Aircraft Metallic Parts



Learning Goals

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

- Understand and explain the properties and applications of various metallic materials used in aircraft structures, including heat treatment of aluminum alloys and corrosion removal for titanium, steel, and other materials;
- Perform advanced metal forming and machining operations, including using the English Wheel, shrinking and stretching techniques, and reverse countersinking;
- Execute advanced structural repair techniques, including damage assessment, repair proposal development, damage removal, and post-repair inspections to ensure compliance with OEM standards;
- Conduct thorough inspections and repairs on enclosed leading edge flush areas, from damage assessment to quality control, ensuring repairs are OEM audit-ready;
- Execute aircraft skin replacement procedures, including assessment, preparation, fitment, alignment, fastener installation, and quality control to maintain structural integrity and aerodynamic efficiency;
- Perform complex repairs on external aircraft skin, from damage assessment and removal to repair part fabrication, assembly, and post-repair inspections;
- Utilize various sources of documentation, including material specifications, regulatory documents, engineering orders, drawing systems, and vendor manuals, effectively in aircraft maintenance and repair;
- Conduct thorough inspections and accurately assess damage in aircraft structures, understanding the implications of for example missing or loose fasteners and performing damage tolerance inspections;
- Identify, assess, and document dents and buckles on aircraft sheet metal structures, ensuring compliance with airworthiness regulations and maintaining accurate damage records;
- Apply, remove, and repair sealant for fuel tanks, identifying areas requiring sealing, selecting appropriate sealant sources, and adhering to safety precautions during repair procedures;
- Perform rotary flap peening on aircraft metallic parts, understanding the techniques, safety considerations, and quality assurance standards, and maintaining accurate documentation and traceability.



Detailed Module Overview

Topic		Teaching Level	Classroom Hours	Practical Hours
01	Introduction	1	0,5	-
02	Metallic Materials <i>Part 2</i>	1	2	-
03	Metal Forming- and Machining Operations (including Tooling and Equipment) <i>Part 3</i>	2	2	-
04	Structural Repair <i>Part 3</i>	2	2	-
05	Enclosed Leading Edge Flush Repair	3	1,5	24
06	Skin Replacement	3	-	24
07	Circumferential Butt Joint – External Skin Repair	3	1	24
08	Source Documentation <i>Part 3</i>	1	2	-
09	Inspection and Damage Assessment <i>Part 2</i>	2	1	-
10	Dent and Buckle Inspection	3	1	4
11	Forward/Aft Cargo Door Surround Edge Repair	3	1	24
12	Sealant Application, Removal and Repair Fuel Tank	3	1	2
13	Rotary Flap Peening of Aircraft Metallic Parts	3	1	2
14	Practical Exercises	3	-	See Module 5, 6, 7, 10, 11, 12 & 13
15	Assessment Criteria	-	-	-
16	Written Test	-	2	-
Total Hours		-	16	104
Course Length			120 Hours	

Teaching Level 1

Teaching level 1 includes the transferring of knowledge from the instructor to the student, through instruction, lecture, demonstration and by having topic-related discussions. Knowledge transfer can take place in a classroom (physical training) as well as through online learning (Computer Based Training (CBT)). The content of e-learning modules should be structured in such a way, keeping in mind that discussions are not possible (it is classified as passive learning), and the participant should be able to understand the material without the intervention of an instructor. Online classes or e-learning modules should be arranged in such a way that the participant has the opportunity to ask questions to the designated instructor or to provide (general) comments. Teaching level A does not include a practical application (hands-on) or the development of practical skills.

Teaching Level 2

Teaching level 2 includes the transferring of knowledge from the instructor to the student, through instruction, lecture, demonstration, topic-related discussions, and limited practical application, but does not include the development of sufficient manipulative skill to perform basic operations. Knowledge transfer can take place in a classroom (physical training) as well as through online learning (Computer Based Training (CBT)). The content of e-learning modules should be structured in such a way, keeping in mind that discussions are not possible (it being classified as passive learning), that the participant should be able to understand the material without the intervention of an instructor. Online classes or e-learning modules should be arranged in such a way that the participant has the opportunity to ask questions to the designated instructor, or to provide (general) comments. Online classes or e-learning modules must contain sufficient demonstration by means of explanatory videos. A high degree of interaction must be built in. Teaching level B requires some hands-on manipulative skills, or practical demonstration of the skills and their accompanying actual or simulated components/equipment, but still may be taught primarily in the classroom environment.

Teaching Level 3

Teaching level 3 includes the transferring of knowledge from the instructor to the student, through instruction, lecture, demonstration, having topic related discussions and a high degree of practical application to develop sufficient manipulative skill to accomplish return to service (normal operation). Teaching level C requires hands-on skill, as well as sufficient and appropriate instructional aides to train the participants to develop manipulative skills sufficient to simulate return to service mechanical skill. At this level, the teaching aids must be similar to or be the actual items of equipment on which the participant is expected to develop the required skill levels. A teaching level C subject cannot be taught solely by instruction or lecture in the classroom; the appropriate training aids and hands-on experience must be used. E-learning modules can be used as a guide through practical assignments. Teaching level C includes a high degree of practical application (hands-on) and a strong focus on the development of practical skills.

Module 1 - Introduction

In Module 1, you'll deepen your understanding of the roles and responsibilities of a sheet metal worker before, during, and after aircraft maintenance. You'll learn what's expected in terms of restoring the integrity of aircraft structures responsibly. This module will cover the personal and professional requirements regarding attitude, behavior, and professionalism. Additionally, you'll identify potential health and safety hazards, learn how to select and use proper personal protective equipment (PPE), and understand key concepts related to FOD (Foreign Object Debris) prevention, human factors, quality awareness, traceability, and maintaining order and tidiness in the sheet metal shop.

Learning Goals

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

- Describe the roles and responsibilities of a sheet metal worker before, during, and after aircraft maintenance;
- Explain the personal and professional requirements for attitude, behavior, professionalism, and ethical working;
- Identify potential health and safety hazards and demonstrate the proper selection and use of personal protective equipment (PPE);
- Understand and apply FOD awareness and prevention techniques;
- Recognize the impact of human factors in aircraft maintenance;
- Develop quality awareness and understand the importance of traceability;
- Maintain order and tidiness in the sheet metal shop, adhering to ACRATS training and house rules.

Topics

1. Course Introduction
2. Health, Safety and Environmental Precautions
 - a. Fumes, Vapor and Dust
 - b. Safety Data Sheets (SDS)
 - c. Personal Protective Equipment (PPE)
3. FOD Awareness & Prevention
4. Human Factors in Aircraft Maintenance
5. Quality Awareness
6. Traceability Awareness
7. Order and Tidiness in the Sheetmetal Shop (ACRATS Training-/House Rules)

Module 2 - Metallic Materials *Part 2*

In Module 2, you'll deepen your understanding of the properties and applications of various metallic materials used in aircraft structures. You'll explore aluminum alloys in detail, including the heat treatment process, equipment requirements, and verification techniques like hardness testing and conductivity measurement. Additionally, you'll learn about the properties and maintenance procedures for titanium and titanium alloys, as well as steel, stainless steel, cadmium-plated parts, and carbon steel. This module will cover corrosion removal procedures and repair techniques tailored to each material type, ensuring you can maintain the integrity of these materials in aircraft applications.

Learning Goals

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

- Understand and explain the properties and applications of various metallic materials used in aircraft structures;
- Describe the heat treatment process for aluminum alloys, including the purpose, requirements, equipment, and verification techniques;
- Apply corrosion removal procedures and repair techniques for titanium and titanium alloys, including protective treatment application;
- Implement corrosion removal procedures and repair techniques for steel and stainless steel, including protective treatment application;
- Perform corrosion removal procedures for cadmium-plated parts and carbon steel.

Topics

1. Introduction
2. Identification of Metals
3. Heat Treatment of Aluminum Alloys
 - a. Purpose
 - b. Requirements
 - c. Equipment
 - d. Process and Procedure
 - e. Conditions
 - f. Heat Treat Verification
 - g. Hardness testing
 - h. Conductivity
4. Titanium and Titanium Alloys
 - a. Corrosion Removal Procedure for Titanium Alloys
 - b. Titanium Repair
 - c. Application of Protective Treatment
5. Steel and Stainless Steel
 - a. Corrosion Removal Procedure for Steel and Stainless Steel
 - b. Steel- and Stainless Steel (CRES) Repair
 - c. Application of Protective Treatment
6. Corrosion Removal Procedures for Cadmium Plated Parts
7. Corrosion Removal Procedures for Carbon Steel



Module 3 - Metal Forming- and Machining Operations (including Tooling and Equipment) Part 3

In Module 3, you'll develop excellence in machining and forming sheet metal parts, including the operation of less commonly used tooling and equipment such as the English Wheel for shaping metal panels with precision, and master methods like shrinking and stretching to manipulate sheet metal to desired shapes and dimensions effectively. Additionally, you'll become adept at performing reverse countersinking operations, enabling you to create recessed holes with precision and accuracy, even in less common situations where access is difficult.

Learning Goals

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

- Operate relevant tooling and equipment to perform advanced machining and forming operations on sheet metal parts;
- Utilize the English Wheel to shape metal panels with precision;
- Apply techniques for shrinking and stretching sheet metal to achieve desired shapes and dimensions;
- Perform reverse countersinking operations to create recessed holes with precision, even in difficult-to-access situations.

Topics

1. Introduction
2. English Wheel
3. Shrinking and Stretching
4. Reverse Countersinking

Module 4 - Structural Repair Part 3

In Module 4, you'll develop expertise in advanced structural repair techniques for aircraft components. You'll learn to apply specialized terms and abbreviations related to aircraft structure and repair, enhancing your understanding of repair documentation and procedures. Through practical exercises and demonstrations, you'll become skilled in using equipment and tools required for repair operations, including repair washers in dimples and countersinks. Additionally, you'll gain insight into standard and specific repairs outlined in the Structural Repair Manual (SRM) and procedures for repairs beyond the SRM. Furthermore, you'll explore concepts such as aerodynamics, aerodynamic smoothness, and material selection to ensure repairs meet regulatory standards and maintain aircraft performance. You'll also learn about the approval process for repairs, including procedures for skin waviness measurement and reverse engineering techniques. Lastly, you'll understand the importance of data recording for allowable damage and repair, ensuring comprehensive documentation of repair activities.

Learning Goals

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

- Apply specialized terms and abbreviations related to aircraft structure and repair to enhance understanding of repair documentation and procedures;
- Use equipment and tools required for advanced repair operations, including repair washers in dimples and countersinks;
- Perform standard and specific repairs as outlined in the Structural Repair Manual (SRM) and handle repairs beyond the SRM;
- Understand aerodynamics, aerodynamic smoothness, and material selection to ensure repairs meet regulatory standards and maintain aircraft performance;
- Navigate the approval process for repairs, including procedures for skin waviness measurement and reverse engineering techniques;
- Record data for allowable damage and repair, ensuring comprehensive documentation of repair activities.

Topics

1. Apply specialized terms and abbreviations related to aircraft structure and repair to enhance understanding of repair documentation and procedures;
2. Use equipment and tools required for advanced repair operations, including repair washers in dimples and countersinks;
3. Perform standard and specific repairs as outlined in the Structural Repair Manual (SRM) and handle repairs beyond the SRM;
4. Understand aerodynamics, aerodynamic smoothness, and material selection to ensure repairs meet regulatory standards and maintain aircraft performance;
5. Navigate the approval process for repairs, including procedures for skin waviness measurement and reverse engineering techniques;
6. Record data for allowable damage and repair, ensuring comprehensive documentation of repair activities.

Module 5 - Enclosed Leading Edge Flush Repair

In Module 5, you'll learn to proficiently execute enclosed leading edge flush repair procedures, ensuring structural integrity, aerodynamic performance, and compliance with OEM standards. You'll gain a comprehensive understanding of the entire process, from initial assessment and preparation to final quality control checks and post-repair inspections. You'll be able to accurately assess damage, develop detailed repair proposals according to SRM guidelines, and select appropriate materials for the fabrication of repair parts. Additionally, you'll understand the importance of alignment confirmation and adherence to safety protocols throughout the repair process, ensuring that repairs are OEM audit-ready.

Learning Goals

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

- Perform thorough inspections using visual and borescope techniques to assess damage accurately;
- Develop detailed repair proposals according to SRM guidelines and select appropriate materials for repair part fabrication;
- Execute enclosed leading edge flush repairs, including damage removal, structural bracing, and repair part fabrication;
- Conduct post-repair inspections and ensure quality control, making repairs OEM audit-ready.

Topics

1. Introduction
2. English Wheel
3. Shrinking and Stretching
4. Reverse Countersinking

Module 6 - Skin Replacement

In Module 6, you'll learn to effectively execute aircraft skin replacement procedures, ensuring structural integrity and aerodynamic efficiency. You'll gain a comprehensive understanding of the entire process, from initial assessment and preparation to final quality control checks. You'll be able to accurately assess damage, select appropriate materials, and perform precise fitment and alignment of replacement skin. Additionally, you'll understand the importance of dimensional integrity verification, alignment confirmation, and adherence to safety protocols throughout the repair process.

Learning Goals

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

- Accurately assess damage and prepare for aircraft skin replacement;
- Perform structural bracing and verify dimensional integrity and alignment;
- Remove fasteners and fit and align new skin using old skin-based hole templates;
- Drill holes in the new skin, perform fitting and trimming, and install fasteners;
- Conduct quality control checks to ensure dimensional integrity and overall repair quality.

Topics

1. Assessment and Preparation
2. structural bracing (bucking/backing support)
3. Dimensional Integrity Verification (Alignment Confirmation)
4. Fastener Removal
5. Fitment and Alignment of the New Skin
6. Old Skin-Based Hole Template Utilization
7. Drilling of holes in the new skin
8. Fitting and Trimming
9. Fastener Installment
10. Quality control Dimensional Integrity Verification (Alignment Confirmation)
11. Quality control



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Module 7 - Circumferential Butt Joint / External Skin Repair

In Module 7, you'll develop the ability to understand and execute complex repairs, such as circumferential butt joint repairs on external aircraft skin. Through comprehensive understanding and practical application, you'll learn to assess damage to external skin, including determining the extent of damage, mapping damaged areas, and establishing allowable damage limits. You'll gain proficiency in selecting appropriate repair methods based on damage assessment results. Additionally, you'll acquire skills in damage removal techniques, fabrication of repair parts, and assembly of repair components. Lastly, you'll understand the importance of post-repair inspection procedures to ensure the structural integrity and airworthiness of repaired circumferential butt joints.

Learning Goals

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

- Assess damage to external aircraft skin, including determining extent, mapping damaged areas, and establishing allowable damage limits;
- Select appropriate repair methods based on damage assessment results;
- Perform damage removal techniques effectively;
- Fabricate repair parts and assemble repair components accurately;
- Conduct post-repair inspections to ensure structural integrity and airworthiness of repaired circumferential butt joints.

Topics

1. Damage Assessment
 - a. Damage Determination
 - b. Damage Mapping
 - c. Allowable Damage Limits
 - d. Repair Method Selection
2. Damage Removal
3. Fabrication of Repair parts
4. Repair Part Assembly
5. Post-Repair Inspection

Module 8 – Source Documentation Part 3

In Module 8, you'll learn to comprehend and effectively use various sources of documentation pertinent to aircraft maintenance and repair. This includes understanding material specifications (including AMS codification), regulatory documentation, engineering orders, drawing systems, and vendor manuals. You'll also learn to use the Structural Repair Manual Inspections (SRMI) to ensure that all maintenance and repair activities are thoroughly documented and compliant with industry standards.

Learning Goals

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

- Comprehend and utilize material specifications, including AMS codification, for aircraft maintenance and repair;
- Navigate and apply regulatory documentation relevant to aircraft maintenance;
- Understand and use engineering orders in the context of aircraft repair;
- Interpret and utilize drawing systems effectively;
- Access and apply information from vendor manuals;
- Conduct and document Structural Repair Manual Inspections (SRMI) to ensure compliance with industry standards.

Topics

1. Material Specification (including AMS Codification)
2. Regulatory Documentation
3. Engineering Orders
4. Drawing Systems
5. Vendor Manual
6. Structural Repair Manual Inspections (SRMI)

Module 9 - Inspection and Damage Assessment *Part 2*

In Module 9, you'll develop the necessary skills and knowledge to conduct thorough inspections and accurately assess damage in aircraft structures. You'll master detailed inspection procedures, understand the implications of airplane operation with for example missing or loose fasteners, and conduct damage tolerance inspections for repairs. Additionally, you'll learn to effectively utilize the Structural Repair Manual Inspections (SRMI) guidelines to ensure all maintenance and repair activities are compliant with industry standards.

Learning Goals

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

- Conduct thorough inspections using detailed inspection procedures;
- Understand the implications of operating an airplane with missing or loose fasteners;
- Perform damage tolerance inspections for repairs;
- Utilize Structural Repair Manual Inspections (SRMI) guidelines effectively.

Module 10 - Dent & Buckle Inspection

In Module 10, you'll learn the principles of dent and buckle inspection techniques, focusing on the recognition, assessment, and documentation of damage on aircraft sheet metal structures. This module is designed to ensure compliance with airworthiness regulations and effective management of aircraft damage records. You'll develop the skills to identify and assess various types of dents and buckles, understanding their implications on structural integrity and aerodynamic performance. Through practical exercises, you'll gain hands-on experience in conducting thorough inspections, using visual and non-destructive testing (NDT) methods, and interpreting detailed damage reports. Additionally, you'll learn to document inspection findings accurately, adhering to regulatory standards and OEM requirements, and ensuring comprehensive record-keeping.

Learning Goals

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

- Understand the principles of dent and buckle inspection and repair techniques for aircraft sheet metal structures;
- Identify, assess, and categorize different types of dents and buckles based on size, shape, and location;
- Conduct thorough inspections using visual inspection and non-destructive testing (NDT) methods;
- Interpret and analyze dent and buckle damage reports, including repair categories and life limits;
- Perform post-repair inspections and ensure compliance with regulatory standards and OEM requirements;
- Apply practical skills in dent and buckle inspection techniques through hands-on training and real-world scenario simulations.

Topics

1. Detailed Inspection Procedures
2. Airplane Operation with Missing or Loose Fasteners
3. Damage Tolerance Inspection for Repairs
4. Structural Repair Manual Inspections (SRMI)

Topics

1. Introduction To Dent and Buckle Inspection
 - a. Overview of Dent and Buckle Inspection on Aircraft Sheet Metal Structures
 - b. Importance of Dent and Buckle Inspection for Ensuring Structural Integrity and Aerodynamic Performance
 - c. Introduction to Dent and Buckle Inspection Techniques and Tools
2. Principles Of Dent and Buckle Identification
 - a. Characteristics and Manifestations on Sheet Metal Surfaces
 - b. Identification of Different Types of Dents and Buckles
 - c. Techniques for Accurately Assessing the Severity and Extent of Damage
3. Inspection Procedures for Dent and Buckle Damage
 - a. Step-By-Step Procedures for Conducting Dent and Buckle Inspections on Aircraft Sheet Metal Components.
 - b. Use of Visual Inspection and Non-Destructive Testing (NDT) Methods.
 - c. Recording Dent and Buckle Inspection Findings
4. Interpretation of Dent and Buckle Reports
 - a. Analysis of Dent and Buckle Reports, Including Damage Descriptions, Locations, and Repair Statuses.
 - b. Repair Categories, Life Limits, and Pending Categories
 - c. Quality Control and Assurance in Dent and Buckle Inspection
 - d. Post-Repair Inspection Procedures for Verifying the Quality and Integrity of Repairs
 - e. Compliance with Regulatory Standards and OEM Requirements
 - f. Documentation and Correct Reporting
5. Practical Application
 - a. Hands-On Training in Dent and Buckle Inspection Techniques. (Simulation Of Scenarios to Practice Dent and Buckle Identification and Assessment)



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Module 11 - Forward/Aft Cargo Door Surround Edge Repair

In Module 11, you'll develop the practical skills required for executing complex repairs, such as the forward/aft cargo door surround edge repair. This module involves learning to access the damaged area, remove necessary fasteners, and cut and remove damaged fuselage skin. You'll gain expertise in fabricating and assembling repair parts, drilling necessary fastener holes, and disassembling repair parts for chemical conversion coating. Additionally, you'll learn to fabricate countersink repair washers, install repair parts with sealant, and apply fillet seal to ensure structural integrity and compliance with OEM standards. The module will also cover post-repair inspection and quality control to ensure the repair meets all necessary standards.

Learning Goals

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

- Verify the applicability of repair procedures for a forward/aft cargo door surround edge repair;
- Access damaged areas and remove necessary fasteners;
- Cut and remove damaged fuselage skin accurately;
- Fabricate, assemble, and drill repair parts, ensuring precise fitment;
- Apply chemical conversion coating and primer to repair parts and bare surfaces;
- Install repair parts with sealant and apply fillet seal to ensure structural integrity;
- Perform post-repair inspections and quality control to comply with OEM standards.

Topics

1. Verifying Applicability
2. Instructions for a Category B repair
3. Repair Instructions
 - a. Access the Damaged Area
 - b. Remove Necessary Fasteners
 - c. Cut and Remove Damaged Fuselage Skin
 - d. Fabricate Repair Parts
 - e. Assemble Repair Parts
 - f. Drill Necessary Fastener Holes
 - g. Disassemble Repair Parts
 - h. Apply Chemical Conversion Coating
 - i. Fabricate Countersink Repair Washers
 - j. Install Countersink Repair Washers with Sealant
 - k. Apply Chemical Conversion Coating and Primer to Repair Parts and Bare Surfaces
 - l. Install Repair Parts with Sealant
 - m. Apply Fillet Seal to Repair Parts
4. Post Repair Inspection and Quality Control

Module 12 - Sealant Application, Removal and Repair Fuel Tank

In Module 12, you'll gain proficiency in sealant application, removal, and repair techniques specifically for fuel tanks. You'll learn to identify areas of the aircraft that require sealing and select the appropriate sealant sources. You'll understand the importance of thoroughly cleaning repair areas before applying sealant and develop skills in proper sealant application to ensure effective sealing. Additionally, you'll learn to safely conduct repairs on fuel tank sealing, adhering to both general and specific safety precautions to mitigate risks associated with fuel tank maintenance.

Learning Goals

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

- Identify areas of the aircraft requiring sealing and select appropriate sealant sources;
- Understand the sources of fuel tank leakage and apply sealant correctly to prevent leaks;
- Clean repair areas thoroughly before applying sealant to ensure effective sealing;
- Safely conduct fuel tank sealant repairs, adhering to general and specific safety precautions.

Topics

1. Introduction
2. Areas of the Aircraft and Applicable Sealing
3. Source of Fuel Tank Leakage
4. Sealing Application
5. Repair of Fuel Tank Sealing
 - a. Safety Precautions – General
 - b. Safety Precautions – Specific
 - c. Cleaning the Repair Area

Module 13 - Rotary Flap Peening of Aircraft Metallic Parts

In Module 13, you'll acquire the knowledge and skills necessary to perform rotary flap peening on aircraft metallic parts. You'll understand the purpose, techniques, and safety considerations involved in flap peening operations. You'll learn to identify damages, select appropriate metallic materials, and execute flap peening procedures effectively. By the end of the training, you'll be proficient in performing flap peening treatments while adhering to quality assurance standards and maintaining accurate documentation and traceability throughout the process.

Learning Goals

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

- Understand the purpose and techniques of rotary flap peening and how it differs from shot peening;
- Identify damages on aircraft metallic parts and select appropriate materials for flap peening;
- Perform flap peening procedures effectively, adhering to safety precautions and quality assurance standards;
- Conduct flap peening test procedures and apply surface treatments;
- Maintain accurate documentation and traceability throughout the flap peening process.

Topics

1. Introduction to Flap peening
2. Shot Peening Vs. Flap Peening
3. Tooling, Equipment & Consumables
4. Safety Precautions
5. Source Documentation
6. Aircraft Metallic Materials
7. Damages
8. Damage Rework
9. Flap Peening Test Procedures
10. Flap Peening Procedures
11. Surface Treatment
12. Quality Assurance
13. Reporting and Traceability

14 - Practical Exercises

Practical exercises are given in module 5, 6, 7, 10, 11, 12 & 13

Module 15 - Assessment Criteria

- ✓ Participants demonstrate the ability to describe the roles and responsibilities of a sheet metal worker in aircraft maintenance, including pre-, during, and post-maintenance tasks, as well as understanding the importance of professionalism, attitude, and safety.
- ✓ Participants exhibit knowledge of health, safety, and environmental precautions in aircraft maintenance, including identifying potential hazards, selecting proper personal protective equipment (PPE), and interpreting safety data sheets (SDS).
- ✓ Participants display proficiency in understanding the properties and applications of various metallic materials used in aircraft structures, including aluminum alloys, titanium, steel, and stainless steel, and demonstrate the ability to apply appropriate repair procedures for each material type.
- ✓ Participants demonstrate excellence in machining and forming sheet metal parts, utilizing techniques such as the English Wheel, shrinking, stretching, and reverse countersinking with precision and accuracy.
- ✓ Participants develop proficiency in advanced structural repair techniques, including understanding specialized terms, selecting proper equipment and tools, executing repairs according to SRM guidelines, and ensuring repairs meet regulatory standards and maintain aircraft performance.
- ✓ Participants are able to proficiently execute complex repair procedures, such as enclosed leading edge flush repair, skin replacement, circumferential butt joint repair, dent and buckle inspection, and forward/aft cargo door surround edge repair, ensuring structural integrity, aerodynamic performance, and compliance with OEM standards.
- ✓ Participants demonstrate competence in conducting thorough inspections, interpreting damage reports, executing precise repair procedures, and adhering to quality control and assurance measures throughout the repair process, ensuring the highest standards of safety and airworthiness.

Module 16 - Examination

The written examination shall contain a minimum of 30 multiple choice questions.

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