1. SCOPE

1.1 Purpose.- This specification is to provide information for the treatment and removal of corrosion from aluminum surfaces being reconditioned.

1.2 Application.- All reconditioning operations and repairs covered by this specification may be accomplished where required without further authorization. Repairs not authorized by this specification cannot be performed without further authorization.

1.3 List of Pages and Revisions.- This specification consists of the pages listed below. An asterisk (*) denotes pages revised at the current revision.

Page	Date	Description of Revision	Serial Effectivity
1	2-5-53		
2	2-5-53		
3	2-5-53		
4	2-5-53		
5	2-5-53		

APPROVED:

USAF Quality Control

B10

WRITTEN BY Lea L. Johnson	DATE ISSUED 2-5-53	OVERHAUL SPECIFICATION REMOVING CORROSION FROM ALUMINUM PARTS	
PROJECT ENGINEER R. B. Bowerbank			
APPROVAL W. K. Olsen	DATE REVISED	Beech Aircraft CORPORATION Wichita 1, Kansas	OVERHAUL SPECIFICATION NO 7010 / PAGE 1
APPROVAL C. S. Allen Jr.			

E-330A

2. APPLICABLE PUBLICATIONS

2.1 Specifications:

2.1.1 Military.-

MIL-S-5002 Surface Treatments (Except Priming and Painting) for Metal and Metal Parts in Aircraft

2.1.2 Air Force - Navy.-

AN-P-656 Primer; Zinc Chromate, for Aircraft Use

2.1.3 Federal.-

VV-K-211 Kerosene

2.1.4 Beech.-

OS 7002 Cleaning Procedures for Reconditioned Aircraft

OS 7007 Sheet Metal Repairs

OS 7008 General Acceptable Quality Standards

2.2 Technical Orders.- Compliance with this specification constitutes compliance with the technical orders listed below:

01-1A-10 Corrosion Control for Aircraft, dated April 24, 1947

01-1-2 Corrosion Treatment for Aircraft, dated November 15, 1948

3. REQUIREMENTS

3.1 Parts Involved.- Aluminum skins on wings, fuselage, tail surfaces and miscellaneous aluminum parts and assemblies.

3.2 Cause for Rejection.- Conditions which cannot be corrected by procedures outlined in Paragraph 3.3, Reconditioning Operations, and/or Paragraph 3.4, Authorized Repairs, is cause for rejection.

3.3 Reconditioning Operations.- The sequence of operation in removing corrosion is, in general, as follows: (1) cleaning and stripping of all surfaces, (2) brightening of surfaces, (3) examining of corroded areas to determine extent and severity of corrosion and method for removal, and (4) applying corrosion removal methods.

3.3.1 Cleaning.- Clean and strip all surfaces free of all oil, grease, dirt, and paint according to OS 7002, Cleaning Procedures for Reconditioned Aircraft. Use procedure most applicable to type soil to be removed.

3.3.2 Brightening.- Brighten surfaces in accordance with paragraph on brightening in OS 7002, Cleaning Procedures for Reconditioned Aircraft.

3.3.3 Corrosion Treatment:

3.3.3.1 Equipment.- Sponge; bristle brush; hand or power rubbing equipment with aluminum wool; wet or dry sand paper (180 and 320 grit); a standard electric or pneumatic hand drill motor having an rpm or 1750; a stainless steel wire wheel of 6-inch diameter with wire size of .003 inch; and a specially shaped power operated buffing and polishing cup for holding aluminum wool; cotton packing, or polishing cloths, each of which is to be used for a specific application. DO NOT USE STEEL WOOL!

3.3.3.2 Solutions.-

(a) Turco W.O. No. 1, one part compound to four parts water

(b) Oakite 33, one part compound to four parts water

(c) Aluminum polish, Alum-Nu, Whiz-Clad, or Min-Hum

3.3.3.3 Procedure.- A careful examination of the surfaces is made at this time by qualified personnel who determine the most applicable method to follow in removing the corrosion and securing its inactivation. Chemical methods for corrosion removal are preferred over abrasive methods and should be used whenever possible to procure satisfactory results. The alcoholic phosphoric acid solution, namely Turco W.O. No. 1 and/or Oakite 33, serves the purpose of (1) removing oxides, (2) removing corrosion products, and (3) leaving a phosphatized surface. The phosphatized surface exerts a passivating influence on the metal surface and also gives an excellent paint base. The corrosion may be classified as (a) light, (b) heavy, or (c) intergranular. After determining the type or class of corrosion, proceed with the corrosion removal method most applicable as shown in the following paragraphs. The methods outlined are general and each specific job will dictate what variations will yield the best corrosion removal. Where the corrosion removal procedure is severe enough to cause the loss of portions of the alclad coating, and the surface cannot be primed with zinc chromate primer, refer the matter to Materials Review Inspector for appropriate action.

3.3.3.3.1 Light Corrosion.- Dilute Turco W.O. No. 1 or Oakite 33 as called out in 3.3.2 and apply the solution to the corroded area with a sponge. Allow the solution to react for about ten minutes. Do not let the surface become dry; re-wet if necessary. Agitate the surface with a bristle brush for a minute or two and then flush off with clean water. Wash the area completely free of acid products. Repeat this operation if all corrosion is not removed. After drying, a light polishing action on exterior surfaces will give a smooth surface and allow the etched area to blend in with the surrounding area.

3.3.3.3.2 Heavy Corrosion.- Where extensive pitting is found, accompanied by much build-up of corrosion products, some mechanical abrasion will usually be required. Depending upon the accessibility of the corroded areas, either hand or power rubbing with aluminum wool and kerosene is used to remove the corrosion products and to smooth the surface area. Apply only sufficient abrasion to remove the damaged metal. Follow the mechanical cleaning with an application of Turco W.O. No. 1 and/or Oakite 33 and continue as in Paragraph 3.3.3.3.1. In isolated small areas, the corrosion may be cleaned off by first using a wet or dry sand paper. Use water in each case to keep the area flooded while abrading the surface. Apply the Turco W.O. No. 1 to accomplish final cleaning on the abraded area. While polishing action is optional, it will add to the general appearance of the surface.

3.3.3.3.3. Intergranular Corrosion.- Intergranular corrosion is more serious than other types of corrosion. It is not only more difficult to detect, until it has reached an advanced stage, but it is also more difficult to correct. In all instances, areas or panels should be replaced where intergranular corrosion is detected. A pile-up of whitish powdery deposit underneath which lies moist white salt embedded in the metal is indicative of this type of corrosion. Careful prodding with a sharp pointed instrument will usually reveal the depth of the damaged metal. Abrasion with aluminum wool and kerosene, followed by wet or dry 180 grit paper and water, will enable the operator to remove the corroded metal. Smooth up with 320 grit paper and treat with Turco W.O. No. 1 solution as directed in Paragraph 3.3.3.3.1. The most difficult areas to evaluate are those where intergramular corrosion exists beneath the surface in the grain boundaries but only minute pits are evident on the surface. Careful probing by an experienced person can, in most cases, reveal the existance of this type of corrosion.

When intergranular corrosion has been established as being present on a surface, the entire part or panel of which it is a portion should be considered of questionable corrosion proofness and critical examination of the entire part should be made by qualified personnel. In most instances, if intergranular corrosion has developed, a prior improper heat-treatment of the part is indicated and thus good engineering practice would be to discard the part. The Materials Review Inspector should make proper disposition of the matter.

3.3.3.3.4 Battery Acid Corrosion.- For the neutralizing of spilled battery acid, use sodium bicarbonate (baking soda) or sodium borate (borax) dissolved in water. The alkali salt must be removed completely after neutralization with copious quantities of water to prevent corrosion of the aluminum. It may be necessary to treat according to Paragraph 3.3.3.3.1 or 3.3.3.3.2.

3.4 Authorized Repairs.- In instances where corrosion has made repairs advisable, perform such repairs in accordance with OS 7007, Sheet Metal Repairs.

4. INSPECTION

4.1 General.- The parts will be inspected to the general acceptable quality standards of OS 7008 and the specific quality standards listed below.

4.2 Beech Inspection.- Beech Inspection personnel shall check all cleaned and renovated areas for complete removal of the corrosion products and note if alclad surfaces have been penetrated.

4.3 Materials Review Inspector.- Appropriate steps shall be taken by Inspection to determine if the cleaned and renovated areas have sufficient thickness of clad coating to protect the base metal. Parts rejected shall be referred to the Materials Review Inspector.

4.4 Beech Chemical Laboratory.- The Beech Chemical Laboratory shall be utilized, if necessary, to inspect and identify certain types of corrosion products for the purpose of properly evaluating the corrosion and outlining appropriate steps for its removal.