SECTION 7. BASIC CORROSION REMOVAL TECHNIQUES

6-113. GENERAL. When active corrosion is found, a positive inspection and rework program is necessary to prevent any further deterioration. The following methods of assessing corrosion damage and procedures for rework of corroded areas could be used during cleanup programs. In general, any rework would involve the cleaning and stripping of all finish from the corroded area, removal of corrosion products, and restoration of surface protective film.

a. Repair of corrosion damage includes removal of all corrosion and corrosion products. When the corrosion damage is severe and exceeds the damage limits set by the aircraft or parts manufacturer, the part must be replaced.

b. If manufacturer information and limits are not available, then a DER must be consulted before the aircraft or part is returned to service.

6-114. PREPARATIONS FOR REWORK. All corrosion products should be removed completely when corroded structures are reworked. Before starting rework of corroded areas, carry out the following:

a. Document corrosion damage**.**

b. Position the aircraft in a wash rack or provide washing apparatus for rapid rinsing of all surfaces.

c. Connect a static ground line from the aircraft to a grounding point.

d. Prepare the aircraft for safe ground maintenance.

(1) Remove battery(s), liquid oxygen generator container (if installed), and external hydraulic and electric power.

(2) Install all applicable safety pins, flags, and jury struts.

e. Protect the pitot-static ports, louvers, airscoops, engine opening, wheels, tires, magnesium skin panels, and airplane interior from moisture and chemical brightening agents.

f. Protect the surfaces adjacent to rework areas from chemical paint strippers, corrosion removal agents, and surface treatment materials.

6-115. FAIRING OR BLENDING REWORKED AREAS. All depressions resulting from corrosion rework should be faired or blended with the surrounding surface. Fairing can be accomplished as follows:

a. Remove rough edges and all corrosion from the damaged area. All dish-outs should be elliptically shaped with the major axis running spanwise on wings and horizontal stabilizers, longitudinally on fuselages, and vertically on vertical stabilizers. (Select the proper abrasive for fairing operations from table 6-1.)

b. In critical and highly stressed areas, all pits remaining after the removal of corrosion products should be blended out to prevent stress risers that may cause stress corrosion cracking. (See figure 6-14.) On a non-critical structure, it is not necessary to blend out pits remaining after removal of corrosion products by abrasive blasting, since this results in unnecessary metal removal.

TABLE 6-1. Abrasives for corrosion removal.

METALS OR MATERIALS TO BE PROCESSED	RESTRICTIONS	OPERATION	ABRASIVE PAPER OR CLOTH			ABRASIVE FABRIC OR PAD	ALUMINUM	STAINLESS STEEL	PUMICE 350 MESH OR FINER	ABRASIVE WHEEL
			ALUMINUM OXIDE	SILICON CARBIDE	GARNET					
FERROUS ALLOYS		CORROSION REMOVAL OR FAIRING	150 GRIT OR FINER	180 GRIT OR FINER		FINE TO ULTRA FINE	X	X	X	X
		FINISHING	400				X	X	X	
ALUMINUM ALLOYS EXCEPT CLAD ALUMINUM	DO NOT USE SILICON CARBIDE ABRASIVE	CORROSION REMOVAL OR FAIRING	150 GRIT OR FINER		7/0 GRIT OR FINER	VERY FINE AND ULTRA FINE	X		X	X
		FINISHING	400				X		X	
CLAD ALUMINUM	SANDING LIMITED TO THE REMOVAL OF MINOR SCRATCHES	CORROSION REMOVAL OR FAIRING	240 GRIT OR FINER		7/0 GRIT OR FINER	VERY FINE AND ULTRA FINE			X	X
		FINISHING	400						X	
MAGNESIUM ALLOYS		CORROSION REMOVAL OR FAIRING	240 GRIT OR FINER			VERY FINE AND ULTRA FINE	X		X	X
		FINISHING	400				X		X	
TITANIUM		CLEANING AND FINISHING	150 GRIT OR FINER	180 GRIT OR FINER				X	X	X

c. Rework depressions by forming smoothly blended dish-outs, using a ratio of 20:1, length to depth. (See figure 6-15.) In areas having closely spaced multiple pits, intervening material should be removed to minimize surface irregularity or waviness. (See figure 6-16.) Steel nut-plates and steel fasteners should be removed before blending corrosion out of aluminum structure. Steel or copper particles embedded in aluminum can become a point of future corrosion. All corrosion products must be removed during blending to prevent reoccurrence of corrosion.

6-116. CORROSION REMOVAL BY BLASTING. Abrasive blasting is a process for cleaning or finishing ferrous metals by directing a stream of abrasive particles against the surface of the parts. Abrasive blasting is used for the removal of rust and corrosion and for cleaning prior to painting or plating. The following standard blast-cleaning practices should be adopted.

a. The part to be blast-cleaned should be removed from the aircraft, if possible. Otherwise, areas adjacent to the part should be masked or protected from abrasive impingement and system (hydraulic, oil, fuel, etc.) contamination.

b. Parts should be dry and clean of oil, grease, or dirt, prior to blast cleaning.

c. Close-tolerance surfaces, such as bushings and bearing shafts, should be masked.

d. Blast-clean only enough to remove corrosion coating. Proceed immediately with surface treatments as required.

6-117. CLEANERS, POLISHES, AND BRIGHTENERS. It is important that aircraft be kept thoroughly clean of contaminating deposits such as oil, grease, dirt, and other foreign materials.

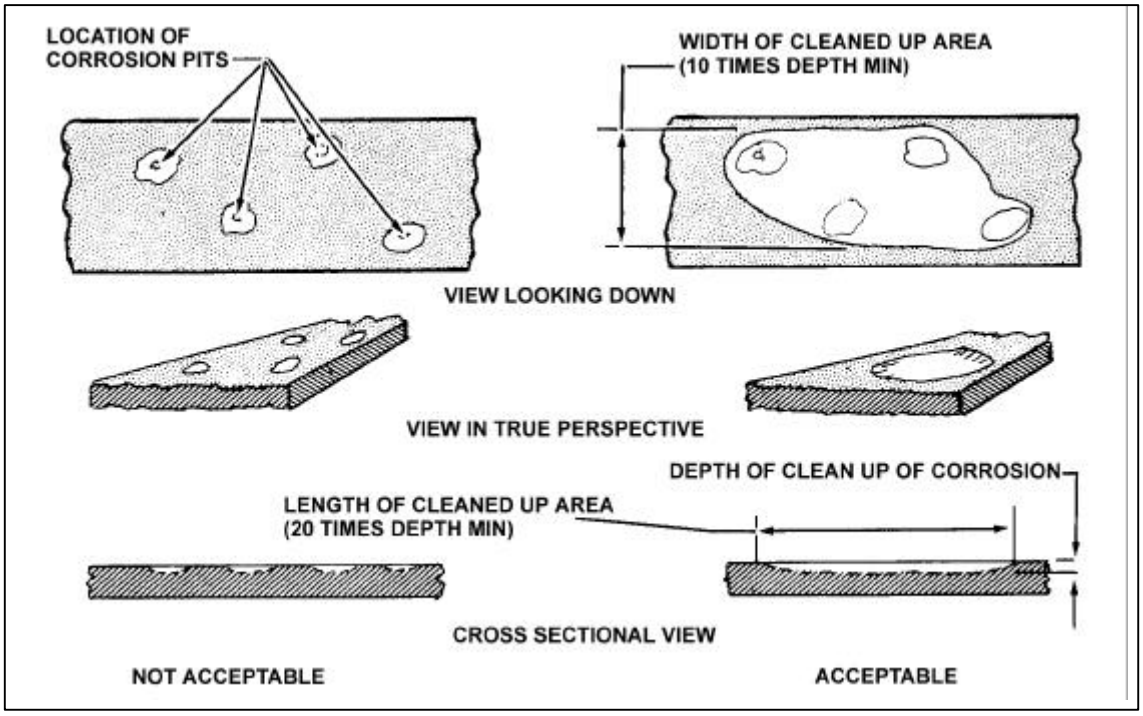

FIGURE 6-14. Typical example of acceptable cleanup of corrosion pits.

a. Materials. Do not use harmful cleaning, polishing, brightening, or paint-removing materials. Use only those compounds that conform to existing government or established industry specifications or that have been specifically recommended by the aircraft manufacturer. Observe the product manufacturer's recommendations concerning use.

b. Chemical Cleaners. Chemicals must be used with great care in cleaning assembled aircraft. The danger of entrapping corrosive materials in faying surfaces and crevices counteracts any advantages in their speed and effectiveness. Use materials that are relatively neutral and easy to remove.

c. Removal of spilled battery acid. The battery, battery cover, battery box and adjacent areas will be corroded if battery acid spills onto them. To clean spilled battery acid, brush off any salt residue and sponge the area with fresh water. For lead-acid batteries, sponge the area with a solution of 6 ounces of sodium bicarbonate (baking soda) per gallon of fresh water. Apply generously until bubbling stops and let solution stay on the area for 5 to 6 minutes, but do not allow it to dry. For nickel-cadmium batteries, sponge the area with a solution of 6 ounces of monobasic sodium phosphate per gallon of fresh water. Sponge area again with clean fresh water and dry surface with compressed air or clean wiping cloths.

6-118. STANDARD METHODS. Several standard mechanical and chemical methods are available for corrosion removal. Mechanical methods include hand sanding using abrasive mat, abrasive paper, or metal wool; and powered mechanical sanding, grinding, and buffing, using abrasive mat, grinding wheels, sanding discs, and abrasive rubber mats. The method used depends upon the metal and degree of corrosion. The removal method to use on each metal for each particular degree of corrosion is outlined in the following section.

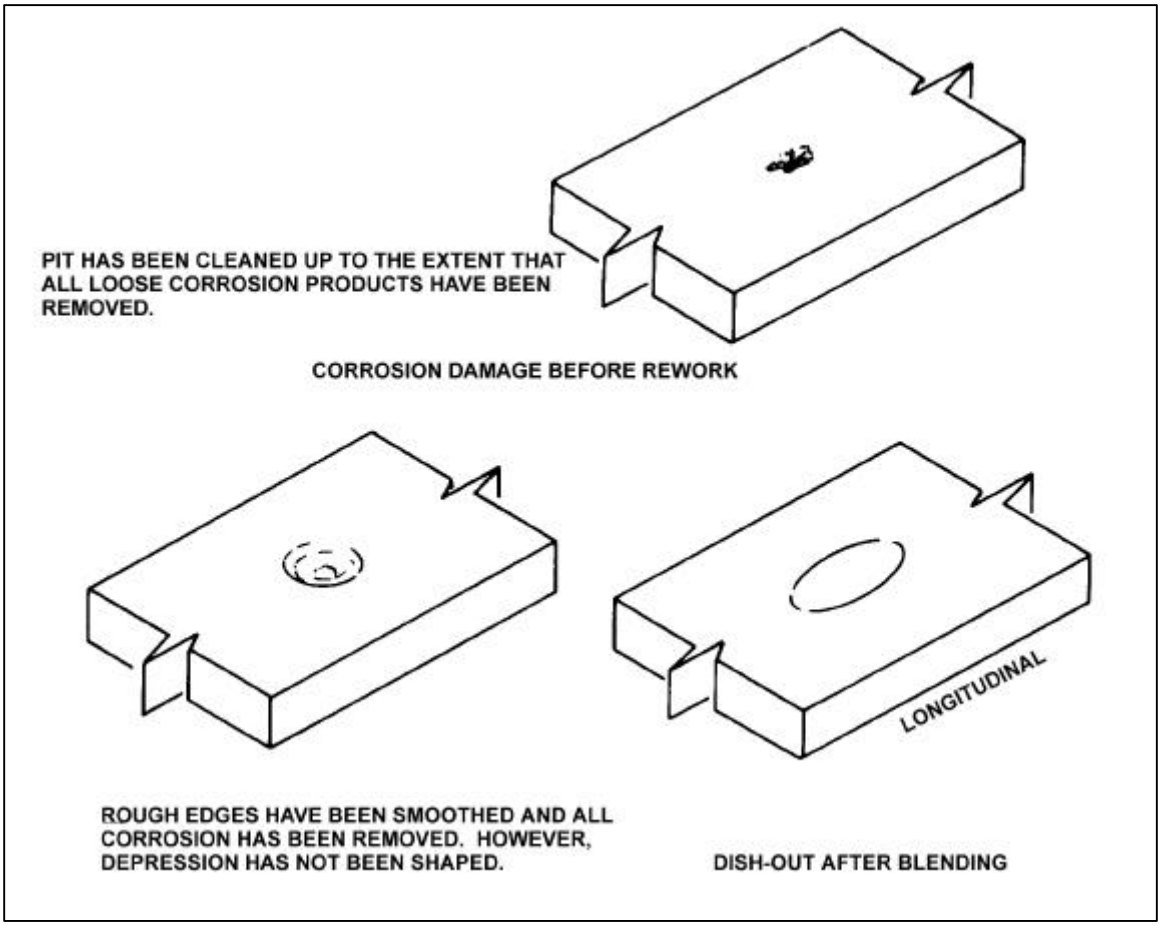

FIGURE 6-15. Blendout of corrosion as a single depression.

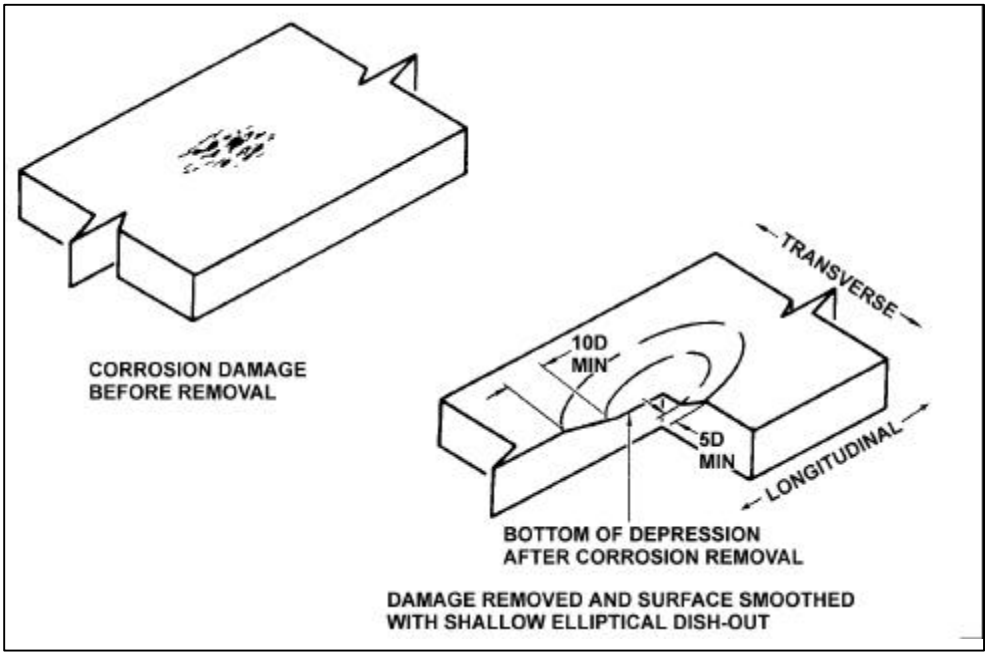

FIGURE 6-16. Blendout of multiple pits in a corroded area.

6-119.—6-131. [RESERVED.]