

CHAPTER

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IDENTIFICATION TYPES AND CAUSES - MAINTENANCE PRACTICES

1. General

The ability to recognize corrosion in its early stages is important, and required, in order for corrective action to be taken, and before costly repairs or replacements become necessary.

2. Identification

A. MAGNESIUM ALLOYS

- (1) Magnesium alloys are the lightest structural metals used for aircraft. Corrosion of magnesium alloys can be greatly diminished by the use of the proper protective finish, such as magnesium conversion coating and paint. Coatings of this type are thicker than those applied by immersion or brush on conversion coating. Anodized finishes cannot be restored in the field. Care should be taken to minimize removal of these coatings.
 - (a) These alloys are highly susceptible to corrosion, which appears as white, powdery mounds or spots when the metal surface is exposed to the environment without a protective finish.
 - (b) The normal oxide-carbonate film formed on magnesium alloys does not provide sufficient corrosion protection even in the mildest environment.
 - (c) The rate of corrosion of a magnesium alloy increases when the alloy is immersed in water or periodically subjected to moisture
 - (d) Corrosion may also be accelerated by dissimilar metal couples and when conductive contaminants are dissolved in the water.

B. ALUMINUM ALLOYS

- (1) Aluminum and alloys of aluminum are the most widely used materials for aircraft construction. Aluminum is highly anodic as evidenced by its position in the galvanic series table. However, the formation of a tightly adhering oxide film offers increased resistance under mild corrosive conditions. Therefore, it is necessary to clean and protect aluminum and its alloys against corrosion. Since pure aluminum is more corrosion resistant than most alloys, aluminum sheet stock is often covered with a thin layer of nearly pure aluminum called cladding or alclad. Cladding is easily removed by harsh treatment with abrasives and tooling, exposing a more corrodible surface. In such areas, chemical conversion coat, paints and corrosion preventive compounds are especially important. However, in a marine environment, all aluminum surfaces require protection.
 - (a) The corrosion product of aluminum is a white to gray powdery material (aluminum oxide or hydroxide) which can be removed by mechanical polishing or brushing with abrasives.
 - (b) It is anodic to most other metals, and, when in contact with them, galvanic corrosion of the aluminum will occur.
 - (c) Aluminum alloys are subject to pitting, intergranular corrosion, and intergranular stress corrosion cracking. In some cases, the corrosion products of a metal in contact with aluminum are corrosive to aluminum.
 - (d) The whitish-powdery deposits also form at discontinuities in the protective coatings and may spread under painted areas, causing blistering and or flaking of the paint.
 - (e) Swelling or bulging of skin material, pulled or popped rivets are often visual indications or corrosion.

C. TITANIUM

- (1) Titanium and titanium alloys find numerous uses in aircraft at temperatures up to 1000°F (538°C). Above 1000°F (538°C), titanium readily absorbs gases from the surrounding air becoming very brittle. Even at temperatures approaching 1000°F (538°C), titanium retains its strength and corrosion resistance.

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- (a) Titanium and its alloys are highly corrosion resistant, because an oxide film forms on their surfaces almost immediately upon contact with air, which is extremely adherent to the surfaces and thus provides a protective barrier. This is identical to the way aluminum forms a protective oxide film on its surface.
- (b) When titanium is heated, different oxides having different colors form on the surface:
NOTE: These are protective discolorations and should not be removed.
 - 1) A blue oxide coating will form at 700°F (371°C) to 800°F (427°C).
 - 2) A purple oxide will form at 800°F (427°C) to 950°F (510°C).
 - 3) A gray or black oxide will form at 1000°F (538°C) or higher.
- (c) Titanium is the less active member (cathodic) of most dissimilar metal couples, but can greatly accelerate corrosion of a dissimilar metal coupled to it.
 - 1) Electrical insulation between titanium and other metals is necessary to prevent galvanic corrosion of the other metal.
 - 2) Frequent inspection of such areas is required to insure that insulation failure has not allowed corrosion to begin.
- (d) Under certain conditions, chlorides and some chlorinated solvents may induce stress corrosion cracking of certain titanium alloys.

D. COPPER

- (1) Copper and copper alloys are quite corrosion resistant with corrosion usually limited to staining and tarnish. Generally, such changes in surface conditions are not dangerous and should ordinarily have no effect on the part. Protective coatings are seldom required because of the inherent resistance of the metal. When coupled with most metals used in aircraft construction, copper is the less active metal and greatly accelerates corrosion of the other metals. This is especially true in copper/aluminum couples. Examples are usually found in electrical components and in areas where copper bonding strips or wires are fastened to an aluminum chassis or structural components.
 - (a) Copper corrosion is evidenced by the accumulation of blue or blue-green corrosion products on the corroded part.
 - 1) The green patina is merely a thin coating consisting mainly of basic copper sulfate and perhaps hydrated copper carbonate.
 - 2) The patina in the thin, firmly adhering state actually offers increased corrosion protection to the base metal, but the patina in a rough or frosted state should be removed.

E. CADMIUM

- (1) Cadmium is used as a coating to protect metal parts and to provide a compatible surface when a part is in contact with other materials. Metal parts are plated either to increase the corrosion resistance of the parts or to develop certain physical properties on the surface of the parts, such as abrasion (wear) resistance and high temperature oxidation resistance. The cadmium plate on iron or steel continues to protect until such time as actual iron rust appears.
 - (a) Corrosion on cadmium is evidenced by brown to black mottling of the surface or as white powdery corrosion products.
 - (b) When cadmium shows mottling and isolated voids or cracks in the coating, the plating is still performing its protective function.
 - (c) Any mechanical removal of corrosion products should be limited to metal surfaces from which the cadmium has been depleted.

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F. ALLOY AND CARBON STEELS

- (1) Ferrous (Iron) alloys are used to manufacture many aircraft components. If unprotected, ferrous alloy surfaces (with the exception stainless steels) are easily corroded in the presence of moisture. Ferrous alloy surfaces of structures or assemblies are normally painted or electroplated to prevent corrosion.
 - (a) Corrosion of steel is easily recognized because the corrosion product is red rust.
 - 1) When ferrous alloys corrode, a dark corrosion product usually forms first.
 - 2) When moisture is present, this coating is converted to red rust, which will promote further attack by absorbing moisture from the air.

G. CORROSION RESISTANT STEELS

- (1) Basically, stainless steels, or corrosion resistant steels, as they are more properly described, are alloys of iron with chromium. Many other elements, such as nickel, sulfur, molybdenum, vanadium, cobalt, columbium, titanium, and aluminum are added in various amounts and combinations to develop special characteristics. Stainless steels are much more resistant to common rusting, chemical action, and high temperature oxidation than ordinary steels, due to the formation of an invisible oxide film or passive layer on the surface of these alloys.
 - (a) Stainless steels are highly susceptible to crevice/concentration cell corrosion and stress corrosion cracking in moist, salt laden environments and can cause galvanic corrosion of almost any other metal with which they are in contact if proper techniques of sealing and protective coating are ignored.

H. NICKEL AND CHROMIUM

- (1) Nickel and chromium are used as protective platings. Chromium plating is also used to provide a smooth, wear-resistant surface and to reclaim worn parts. Where corrosion resistance in a marine environment is required, a nickel under-coat is used. The degree of protection is dependent upon plating thickness. Both of these metals form continuous oxide coatings that can be polished to a high luster and still protect not only themselves but any underlying metal.
 - (a) Chromium coatings contain cracks, and corrosion originates at the base metal below these separations.

I. SILVER, PLATINUM, AND GOLD.

- (1) These metals do not corrode in the ordinary sense, although silver tarnishes in the presence of sulfur.
 - (a) Silver tarnish is a brown-to-black film.
 - (b) Gold tarnish is very thin and shows up as a darkening of reflecting surfaces.

J. GRAPHITE/CARBON FIBER COMPOSITES.

- (1) Graphite or carbon fiber composites are materials which consist of reinforcing fibers in a matrix made of organic resin, usually epoxy. They are an important class of aviation materials because of their high strength to weight ratios and high stiffness.
 - (a) Carbon is the least active metal in the galvanic series, it will accelerate the corrosion of any aircraft metal to which it is coupled.
 - (b) Insulation between graphite or carbon epoxy composites and other metals is necessary to prevent dissimilar metal attack on the attached part.

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Corrosion of Metals -- Type of Attack and Appearance of Corrosion Products

Alloys	Type of Attack to Which Alloy Is Susceptible	Appearance of Corrosion Product
Magnesium Alloy	Highly susceptible to pitting	White, powdery, snowlike mounds, and white spots on surface
Low Alloy Steel (4000--8000 series)	Surface oxidation and pitting; surface and intergranular corrosion	Reddish--brown oxide (rust)
Aluminum Alloy	Surface pitting, intergranular, exfoliation, stress corrosion and fatigue cracking, and fretting	White to gray powder
Titanium Alloy	Highly corrosion resistant; extended or repeated contact with chlorinated solvents may result in degradation of the metal's structural properties	No visible corrosion products at low temperature. Colored surface oxides develop above 700°F (371°C)
Cadmium (used as a protective plating for steel)	Uniform surface corrosion; used as sacrificial plating to protect steel	From white powdery deposit to brown or black mottling of the surface.
Stainless Steels (300-- 400 series)	Crevice/concentration cell corrosion; some pitting in marine environments; corrosion cracking; intergranular corrosion (300 series); surface corrosion (400 series)	Rough surface; sometimes a red, brown, or black stain.
Nickel--base Alloy (Inconel, Monel)	Generally has good corrosion resistant qualities; susceptible to pitting in sea water	Green powdery deposit
Copper--base Alloy, Brass, Bronze	Surface and intergranular corrosion	Blue or blue--green powdery deposit
Chromium (plate)	Pitting (promotes rusting of steel where pits occur in plate)	No visible corrosion products; blistering of plating due to rusting and lifting.

3. Types

- A. The terminology used in describing corrosion is based on either the appearance of the corrosion attack, or the mechanism associated with its formation. Frequently, several types of corrosion will occur simultaneously and it becomes difficult to determine the specific cause.
- B. The following types of corrosion are those most commonly encountered on airplanes:
 - (1) UNIFORM SURFACE CORROSION

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- (a) Uniform surface corrosion results from a direct chemical attack on a metal surface and involves only the metal surface. On a polished surface, this type of corrosion is first seen as a general dulling or etching of the surface and, if the attack is allowed to continue, the surface becomes rough and possibly frosted in appearance. This type of corrosion appears uniform because the anodes and cathodes are very small and constantly shift from one area of the surface to another. An example is the etching of metals by acids. The discoloration or general dulling of metal created by exposure to elevated temperatures is not considered to be uniform surface corrosion.
- (2) GALVANIC
- (a) Galvanic corrosion occurs when different metals are in contact with each other and an electrolyte, such as salt water. It is usually recognizable by the presence of a buildup of corrosion at the joint between the metals. For example, aluminum skin panels and stainless steel doublers, riveted together in an aircraft structure, form a galvanic couple if moisture and contamination are present.
- (3) PITTING
- (a) The most common corrosion on aluminum and magnesium alloys is called pitting. It is first noticeable as a white or gray powdery deposit, similar to dust, which blotches the surface. When the deposit is cleaned away, tiny pits or holes can be seen in the surface. Pitting corrosion can also occur in other types of alloys. The combination of small active anodes to large passive cathodes cause severe pitting.
- (4) FILIFORM
- (a) Filiform corrosion is a special form of oxygen concentration cell corrosion or crevice corrosion which occurs on metal surfaces having an organic coating system. It is recognized by its characteristic wormlike trace of corrosion products beneath the paint film. Filiform occurs when the relative humidity of the air is between 78 and 90 percent and when the surface is slightly acidic. It starts at breaks in the coating system, such as scratches and cracks around fasteners and seams, and proceeds underneath the coating, due to the diffusion of water vapor and oxygen from the air through the coating. Filiform corrosion can attack steel, magnesium, and aluminum surfaces and may lead to more serious corrosion in some locations. Filiform corrosion can be prevented by storing equipment and aircraft in an environment with a relative humidity below 70 percent, by using coating systems having a low rate of diffusion for oxygen and water vapors, by maintaining coatings in good condition, and by washing equipment and aircraft to remove acidic contaminants from the surface (such as those created by pollutants in the air). Maintain coatings in good condition (prompt touchup around fasteners) and apply corrosion preventive compounds (CPC's) when paint is damaged.
- (5) STRESS CORROSION CRACKING
- (a) Stress corrosion cracking is the inter--granular or transgranular cracking of a metal caused by the combined effects of constant tensile stress (internal or applied) and corrosion. Internal or residual stresses are produced by cold working, forming, and heat treatment operations during manufacture of a part and remain concealed in the part unless stress relief operations are used. Other hidden stresses are induced in parts when press or shrink fits are used and when slightly mismatched parts are clamped together with rivets and bolts. All these stresses add to those caused by applying normal loads to parts in operation. Metals have threshold stresses below which stress corrosion cracking will not occur. This threshold stress varies from metal to metal, is different for different tempers of the same metal, and is different for each of the three directions in which stress can be applied.
- (6) FRETTING

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(a) This is a special form of concentration cell corrosion, which occurs in combination with surface wear. The corrosion products increase the wear of the surface and the wear exposes more bare metal surface to be corroded. The overall effect is greater than the single effects of corrosion and wear added together. It has the general appearance of galling, in which chunks of metal are torn from the surface with corrosion at the torn areas or ragged pits. This type of corrosion occurs on faying surfaces of close tolerance and on parts under high pressure in a corrosive environment when there is slight relative movement of the parts, such as that caused by vibration. Fretting corrosion is normally encountered in heavily loaded static joints which are subject to vibration and are not and/or cannot be sealed to prevent moisture entry, such as landing gear component attachment areas having lug holes with slight press fits or slip fit bushings with very close tolerance bolts passing through the bushings. Another area is wing root access panels or wing to body fairings, which are generally not tightly secured and cannot be sealed in faying surfaces.

(7) INNER-GRANULAR

(a) Intergranular corrosion is an attack on the grain boundaries of the metal. A highly magnified cross section of any commercial alloy shows the granular structure of the metal. It consists of quantities of individual grains, each having a clearly defined boundary, which chemically differs from the metal within the grain. Frequently the grain boundaries are anodic (tend to corrode more easily) to the metal within the grain. When in contact with an electrolyte, rapid corrosion occurs at the grain boundaries.

(8) EXFOLIATION

(a) Exfoliation is an advanced form of intergranular corrosion where the surface grains of a metal are lifted up by the force of expanding corrosion products occurring at the grain boundaries. The lifting up or swelling is visible evidence of exfoliation corrosion. Exfoliation occurs on extruded, rolled, wrought, and forged high strength aluminum and magnesium parts.

(9) MICROBIOLOGICAL

(a) Slimes, molds, fungi, and other living organisms (some microscopic) can grow on damp surfaces. Once they are well established, the area tends to remain damp, increasing the possibility of corrosion. Their presence can cause the areas they occupy to have different oxygen and electrolyte concentrations. In addition, corrosive wastes are secreted, which cause corrosion. This type of corrosion can occur in integral fuel tanks. It is caused by the presence of bacteria and in jet fuel. The fungus grows at the fuel/water interface and the metabolic products formed, corrode the metallic structure.

4. DEGRADATION OF NON-METALS.

A. Non-metallic materials (plastics, elastomers, paints and adhesives) are not subject to electro-chemical corrosion, since ions are not easily formed from non-metallic materials and since the electrical conductivity of non-metals is extremely low. In general, aircraft non-metallic materials are selected for their obvious performance properties (flexibility, transparency, strength, electrical resistance, etc.) as well as their resistance to heat, impact, abrasion, ultraviolet radiation, moisture, ozone and other detrimental gases as well as operational fluids such as hydraulic fluid, lubrication oil, cleaners, deicing fluids and others.

- (1) The degradation of non-metals depends on the chemical makeup of the material and the nature of the environment.
- (2) The use of unauthorized maintenance chemicals and procedures can accelerate degradation and ultimately lead to material failure resulting in leakage, corrosion, electrical shorts, crazing, and/or mechanical failure.

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INSPECTION AND DETECTION - MAINTENANCE PRACTICES

1. Inspection for Corrosion

A. General

(1) The regular maintenance program should include inspection for corrosion followed by correct treatment of affected areas. The areas should be inspected for not only actual corrosion damage but also for conditions that could cause corrosion (such as damaged finishes or blockage of drain holes). Because corrosion is a problem that will not go away, frequent inspection of the problem areas is recommended. Unusual environmental conditions in some geographical locations could make changes necessary to the frequency of inspections. Refer to these references for more details:

- (a) STRUCTURES - CORROSION INSPECTIONS - MAINTENANCE PRACTICES, PAGEBLOCK 51-05-01/201
- (b) DOORS - STRUCTURAL INSPECTIONS - MAINTENANCE PRACTICES, PAGEBLOCK 52-05-03/201
- (c) FUSELAGE - STRUCTURAL INSPECTIONS - MAINTENANCE PRACTICES, PAGEBLOCK 53-05-03/201
- (d) NACELLES/PYLONS - STRUCTURAL INSPECTIONS - MAINTENANCE PRACTICES, PAGEBLOCK 54-05-03/201
- (e) STABILIZER - STRUCTURAL INSPECTIONS - MAINTENANCE PRACTICES, PAGEBLOCK 55-05-03/201
- (f) PASSENGER CABIN WINDOWS, SECTION 56-21
- (g) WINGS - STRUCTURAL INSPECTIONS - MAINTENANCE PRACTICES, PAGEBLOCK 57-05-03/201

(2) Special Inspections.

(a) In instances where loading of nonstandard cargo (i.e. livestock or fish) or cargo spillage of harmful products (i.e., mercury) occur, specific inspection requirements are initiated.

(b) Mercury.

1) After a reported mercury spill in the cargo hold area, maintenance personnel are instructed to remove the spillage as rapidly as possible due to the damaging effect mercury has with aluminum structures. Visual inspections of mercury penetration into aluminum metals should be noted and reported. Detailed procedures for mercury spillage are given in MERCURY SPILLAGE CONDITION, SUBJECT 05-51-14.

(c) Livestock and fish cargo.

1) Subsequent to livestock or fish hauling on an airplane, specific areas should be inspected for signs of contaminants that cause corrosion. Detailed procedures are given in TRANSPORTATION OF LIVE ANIMALS, SUBJECT 51-00-60 and TRANSPORTATION OF FISH, SUBJECT 51-00-62.

(3) Methods of Inspection. Visual or nondestructive inspection (NDI) procedures are used for identifying the existence of corrosion. For general inspection, the visual means aided by magnifying glasses, borescopes, etc., is used extensively. The NDI techniques have limited capability to locate or detect corrosion because of complexity of instrumentation, complexity of areas being inspected and time consumed to make the inspection. In specific localized areas where inspection by visual means is impossible or where extent of corrosion has to be determined after visual detection, the NDI technique may be used. The following NDI techniques are used to inspect the localized areas; however, the method employed should be at the judgment of the NDI technician.

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- (a) Eddy current.
 - 1) Eddy current can be used to locate corrosion in skin, doubler and spar areas. The method is also used to determine if corrosion visible by corrosion products, skin bulging or joint dislocation has generated microcracks. Refer to Eddy Current, THE BOEING COMPANY, 737 NDT Part 1, 51-06-00 for more details.
- (b) Ultrasonic.
 - 1) Ultrasonic inspection technique is used for flaw detection in honeycomb sandwich constructions or bonded panels. Corrosion can be detected by measurement of panel thickness by ultrasonic means. Refer to Ultrasonic, THE BOEING COMPANY, 737 NDT Part 1, 51-04-00 for more details.
- (c) Radiographic.
 - 1) Radiography (X-ray) is used for flaw detection in areas not accessible for visual inspection without major disassembly. This method is also used for backup method to other NDI techniques (i.e., detect core corrosion in sandwich panels located by the ultrasonic method). Severe corrosion can be detected by radiographic means if the depth or metal loss is 20 percent of the panel thickness or greater. Refer to X-Ray, General Radiographic Practices, THE BOEING COMPANY, 737 NDT Part 1, 51-02-00 for more details.
- (d) Penetrant.
 - 1) Penetrant examination uses the property of a liquid to go into a defect that is open at the surface of the part. The liquid is applied to the surface and permitted to soak in. Unwanted liquid is removed from the surface, but some liquid stays in the defect. A developer is applied to pull the liquid out of the defect so it can be seen. Visible penetrants are examined under white light. Fluorescent penetrants are examined under ultraviolet light. This technique is also used to detect surface and intergranular corrosion.
- (e) Magnetic particle.
 - 1) Magnetic particle examination can be done only on materials with ferromagnetic properties, usually low alloy steels and heat-treatable stainless steels. It is a sensitive nondestructive procedure to find surface and near-surface cracks and discontinuities.

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ENVIRONMENTAL EFFECTS - MAINTENANCE PRACTICES

1. General

- A. The probability of encountering corrosion damage to an airplane is dependent on a number of factors such as the degree of protection afforded during manufacture, the maintenance of the protection during service life, and the environment in which the airplane is operated.
- B. Some environmental factors are within the control of the manufacturer or the operator such as the Location of battery compartments or the prevention of spillage from galleys and lavatories. In these instances, recommended inspection frequencies or requirements for preventive maintenance can be established which are not dependent on the operator's route structure.

2. Corrosive Environments

- A. Corrosion of aviation equipment is caused by both natural and man-made environments. Natural conditions which affect the corrosion process are moisture, temperature, salt atmospheres, ozone, sand, dust, solar radiation, insects and birds, and microorganisms. Man-made conditions, which also affect the corrosion process, are industrial pollution, manufacturing operations, storage conditions, and shipment. By understanding these conditions, maintenance personnel will be better able to prevent aircraft damage.

(1) MOISTURE

- (a) Moisture is present in air as a gas (water vapor) or as finely divided droplets of liquid (mist or fog) and often contains contaminants such as chlorides, sulfates, and nitrates, which increase its corrosive effects. Moisture enters all areas of an aircraft that air can enter. Moisture will condense out of air when the air becomes too cool to hold all of the moisture in it.

1) Condensed moisture.

- a) Condensed moisture will usually evaporate as surrounding air warms but will leave its contaminants (residues), including salts, behind. This can result in the build-up of soils and salt contamination. Condensed moisture and its contaminants can also be trapped in close fitting wettable joints, such as faying surfaces. Moisture can accumulate in such areas through successive cycles of warming and cooling. In addition, moisture can be drawn along poor bond lines by capillary action (wicking).
- b) All non-metals absorb some moisture which may cause changes in dimensional stability, dielectric strengths, ignition voltages, and volume insulation resistances. In general, organic matrix composites are adversely affected by moisture and may suffer a loss of strength and stiffness from exposure.

(2) TEMPERATURE

- (a) Temperatures at the high end of the range for which equipment is designed may result in either improvement or degradation of equipment, depending on conditions. Some electronic equipment may not function properly at high temperatures. Mold and bacteria growth are also inhibited by temperatures above 104°F (40°C). Temperatures at the low end of the design range generally reduce the rate of corrosion.

- 1) Generally, corrosion and other harmful processes (such as the degradation of non metallic materials) increase as temperatures rise, but in some instances, moderate increases in temperature may serve to reduce corrosion by preventing condensation
- 2) Mold and bacteria growth are also inhibited by temperatures above 104°F (40°C).

(3) SALT ATMOSPHERE

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- (a) When dissolved in water, salt particles form strong electrolytes. The ocean, which carries from 3.5 to 3.9 percent salt, is the world's primary source of salt. Normal sea winds carry from one to ten grams of sea salt per cubic meter of air. Since dissolved salts are strong electrolytes, it is easy to understand why coastal environments are highly corrosive.
- (4) OZONE
 - (a) Ozone is a particularly active form of oxygen which is formed naturally during thunderstorms and by photo-chemical reactions in smog. .
 - 1) When ozone is absorbed by electrolyte solutions in contact with metals, it increases the rate of corrosion.
 - 2) It also oxidizes many nonmetallic materials, being particularly harmful to natural and certain types of synthetic rubber
- (5) OTHER INDUSTRIAL POLLUTANTS
 - (a) Carbon (from internal combustion engine exhaust), nitrates (from agricultural fertilizers), ozone (from electrical motors and welding operations), sulfur dioxide (from engine exhaust and industrial and ship smoke stacks), and sulfates (from automobile exhaust) are important airborne pollutants. The combination of these pollutants contributes to the deterioration of non-metallic materials and severe corrosion of metals.
- (6) SAND, DUST AND VOLCANIC ASH.
 - (a) Sand, dust, and volcanic ash are present in many areas, but particularly in industrial areas where they often contain a number of tar products, ashes, and soot. Dust is also found in the tropic zones during times of little or no rainfall. Sand and dust are extreme problems in the deserts, since dry, powdery sand and dust are carried by wind. During sandstorms, they can penetrate sealed equipment as well as many internal areas of airframes. In arid regions such as deserts, small sand particles are often blown as high as 10,000 ft (3 km) by the wind.
 - 1) Sand, dust and volcanic ash are hygroscopic and, when present on internal or external surfaces of aircraft or electronic parts, can absorb and hold moisture.
 - 2) The presence of sand, dust and volcanic ash may also effect the operation of electrical contacts, prevent proper action of rotating motor-drive devices, and cause malfunctions of indicating instruments.
 - 3) Dust from volcanic areas contain chlorides and sulfates, which are extremely corrosive in the presence of moisture. Although small amounts of sand or dust may be unnoticed by operating personnel, they may be sufficient to promote corrosion.
- (7) SOLAR RADIATION
 - (a) The two ranges of solar radiation most damaging to materials are:
 - 1) Ultraviolet, the range that causes sunburn
 - 2) Infrared, the range that makes sunlight feel warm.
 - (b) On earth, maximum solar radiation occurs in the tropics and equatorial regions, but considerable damage occurs in the temperate zones as a result of solar heating, photochemical effects, and combinations of these two phenomena.
 - 1) Non-metals, especially organic and synthetic materials, are strongly affected by sunlight. Both natural and synthetic rubber deteriorate rapidly under sunlight.
 - 2) After extended exposure, plastics darken, paints lose their protective characteristics, polymers undergo marked decreases in strength and toughness, and colors fade.
- (8) CLIMATE

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- (a) Actual assessments of environmental conditions have to be made Locally by the operator. The environment is a combination of many factors and some of those which should be considered are as follows:
- 1) Desert
 - a) The hot, wind--swept desert creates a severe maintenance problem because powdery dust can penetrate even supposedly sealed components. High daytime temperatures, high humidities (in areas such as the Persian Gulf) ultraviolet radiation, and fine dust are the four most serious, destructive elements of the desert climate. Nonmetallic materials suffer the most damage from the hot desert climates where air temperature during the day may reach 124°F (51°C). Temperatures inside closed containers may be 100°F (38°C) higher than external air temperatures.
 - 2) Temperate zones.
 - a) The temperate or intermediate climate zone encompasses most of the North American and European continents. These areas at various times of the year may approximate the extremes of polar, desert, or tropical temperatures and humidity. The temperate zone temperatures range from -25°F (-32°C) to 59°F (15°C) in the winter and from 59°F (15°C) to 125°F (52°C) in summer. The most critical areas are coastal locations, during the warm periods of the year in which the relative humidity approaches 100 percent at night and the air has high concentrations of salt. Moisture from this salt--laden air can condense on equipment during early evening and morning hours, thereby causing serious corrosion. Because of its relatively mild temperatures, the temperate zone is also the most heavily populated. Consequently, the smoke, smog, ozone, and corrosive fumes associated with heavy industry are also found there.
 - 3) Tropics
 - a) Even though they encompass only a small portion of the earth's land area, the tropics demand the greatest amount of consideration from the stand point of corrosion treatment and control. Relative humidities of up to 100 percent at ambient air temperatures of 85°F (29°C) and dewpoints approaching 85°F (29°C) pose formidable threats of corrosion. When high humidity and temperature conditions are combined with salt--laden air, the corrosive environment becomes extremely severe.

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CORROSION REMOVAL - MAINTENANCE PRACTICES

1. General

- A. When you remove corrosion, complete removal is most important. If all of the corrosion is not removed, the corrosion will continue. For example, if you find corrosion around fastener locations, you must remove the fastener and look for corrosion under the fastener heads and in the holes. Corrosion removal around such fasteners without fastener removal will not stop the corrosion under the fasteners (Fig. 8).
- B. Complete removal of corrosion products is also necessary, or the corrosion could come back. Carefully examine all of the area to make sure all corrosion products and other contamination are gone.
- C. Dye penetrant inspection will not show if all of the corrosion products were removed from an area. The area must be visually examined to be sure.
- D. The area must be clean, without paint, oil or grease, before you can treat it for corrosion.
- E. Corrosion can be removed by mechanical procedures or chemical procedures. The details and the selection decision will be different for different amounts of corrosion and different types of metal. Refer to par. 7 for general data about these procedures. Refer to par. 8 and on for details for the different metals.

2. Safety Procedures

NOTE: Refer to par. B. for emergency safety procedures.

- A. General Safety Precautions. Obey these safety precautions when you use solvents, special cleaning compounds, paint strippers (strong alkalis or acids), etchants (corrosion removers that contain acids) or conversion coating chemicals.
 - (1) Do not breathe solvent or acid vapors. Do not use solvents or acids in confined spaces without sufficient ventilation or approved respiratory protection.
 - (2) Do not add water to acid. Always add acid to water. Water added to acid will boil at an explosively rapid rate.
 - (3) Do not mix chemicals unless as given in the procedures.
 - (4) Make sure water for emergencies is available at the work area before work is started.
 - (5) Do not let your skin touch solvents, cleaners, acid etchants, or conversion coating material. Put on rubber plastic gloves when you use these materials. Put on goggles or plastic face shields and rubber raincoats and rainhats when you clean, strip, etch, or apply conversion coating to overhead surfaces.
 - (6) When you mix alkalis with water or other agents, use containers which are resistant to the heat that will result.
 - (7) Wash your skin or clothing immediately after it touches paint stripper, etchant or conversion coating material.
 - (8) If material gets in the eyes, quickly flush it out with water. Then send the injured person to the medical department for further treatment.
 - (9) Do not eat or keep food in areas where it could absorb poisons. Always wash your hands before you eat or smoke.
 - (10) Clean all equipment after work is completed.
- B. Emergency Safety Procedures. Know these emergency safety procedures before you use materials which refer to an emergency safety procedure.
 - (1) If touched by the following materials, treat as shown below:

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Methyl alcohol	Xylene
Methyl ethyl ketone	Petroleum naphthas
Methyl isobutyl ketone	Chromates
Toluene	Dichromates
Trichloroethylene	Acetates
Epoxy resin	Cyclohexanone
Methylene chloride	Cellosolve
Brush alodine	Carbon tetrachloride

- (a) If splashed into eyes, do not rub. Flush eyes immediately with water for at least 15 minutes. Lift upper and lower lids frequently to ensure complete washing.
- (b) If splashed on clothing or large areas, immediately remove contaminated clothing and wash body with plenty of soap and water. Wash clothing before you put it back on.
- (c) If splashed onto an easily accessible part of the body, immediately wash with soap and water.
- (d) If suffering headache or other obvious symptom resulting from overexposure, move to fresh air immediately.
- (e) If vapors are inhaled and breathing has slowed down or stopped, remove person from exposure and start artificial respiration at once. Call ambulance and continue this treatment until ambulance arrives.

(2) If exposed to physical contact with any of the following materials:

Hydrofluoric acid	Phenol
Nitric acid	Cresols
Phosphoric acid	Tricresyl phosphate

- (a) Eyes: If splashed into eyes, do not rub, flush immediately with water for at least 15 minutes. Lift upper and lower eyelids frequently to ensure complete washing. Call Medical immediately.
- (b) Exposed skin: If splashed on skin, wash affected area with large amounts of water for at least 15 minutes. Report to Medical.
- (c) Clothing: If splashed on clothing or large area of body, remove contaminated clothing and wash body under a shower for at least 15 minutes. Wash clothing before reuse. Report to Medical.
- (d) Inhalation: If vapors are inhaled, removed worker to fresh air and apply artificial respiration if necessary. Call Medical.

NOTE: Tricresyl phosphate is not considered an inhalation hazard.

- (e) Internally proceed as follows:
 - 1) Worker unconscious: Do not give any liquid. Begin artificial respiration and have someone call Medical immediately. Worker conscious:
 - a) Phenols and Cresols: Do not attempt to induce vomiting. Encourage victim to wash out mouth with large quantities of water. Call Medical immediately.
 - b) Phosphoric Acid: Do not induce vomiting. Call Medical immediately.

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- c) Hydrofluoric Acid: Drink water to dilute acid, then cause vomiting by placing finger in the back of throat. Repeat. Wash out mouth repeatedly. Call Medical immediately.
- d) Nitric Acid: Do not induce vomiting. Drink large quantities of water, if possible. Call Medical immediately.
- e) Tricresyl Phosphate: Cause vomiting by placing finger in the back of throat. If necessary, have victim drink water, then use finger to induce vomiting. Call Medical Immediately.

3. Corrosion Damage and Rework Limits

- A. Corrosion evaluation will be required after initial inspection and cleaning to determine nature and extent of repair or rework. It is difficult to establish a distinct and specific dividing line between various conditions, consequently, the first requirement for evaluation is good and sound maintenance judgment. Evaluate corrosion as follows:
 - (1) Light corrosion.
 - (a) Characterized by discoloration or pitting to a depth of approximately 0.001 in. (0.025 mm) maximum. This type of damage will normally be removed by light hand sanding or a minimum of chemical treatment.
 - (2) Moderate Corrosion.
 - (a) Appears similar to light corrosion except there may be some blisters or evidence of scaling and flaking. Pitting depths may be as deep as 0.010 in. (0.254 mm). This type of damage will normally be removed by extensive hand or mechanical sanding.
 - (3) Heavy (severe) Corrosion.
 - (a) General appearance may be similar to moderate corrosion with severe blistering exfoliation and scaling or flaking. Pitting depths will be deeper than 0.010 in. (0.254 mm). This type of damage will normally be removed by extensive mechanical sanding or grinding.
- B. Degree of Corrosion Damage. A preliminary assessment of corrosion damage is sometimes advisable before cleanup to determine whether there is any chance of reclaiming the part. Where damage is obviously in excess of allowable limits, repair or replacement action should be initiated.
- C. Previously Reworked Areas. Allowable damage data is normally based on a loss of material thickness, however, this must also include any loss in thickness due to previous rework. Previous rework can be ignored if the actual thickness remaining after corrosion cleanup is measured. Suitable NDT equipment (such as eddy-current or ultrasonic instruments) is recommended both for crack detection and thickness measurement.
- D. Depth Measurement Using Straightedge. Depth measurement is often possible using a straightedge and a 10-power magnifying glass as shown in Fig. 1. The straightedge should be placed at various angles to ensure that incorrect measurements are not recorded due to local surface irregularities.
- E. Measuring Corrosion Damage with a Dial Depth Gage. The method for taking measurements with a dial depth gage is outlined below:
 - (1) Remove corroded material and blend out the damage.

NOTE: The base of the depth gage shall be flat against the undamaged surface on each side of the corrosion. When taking measurements on concave or convex surfaces, place the base perpendicular to the radius of curvature of the surface.
 - (2) Position the depth gage and determine the measurement reading.
 - (3) Take several additional depth readings.
 - (4) Select the deepest reading as the depth of the corrosion damage.

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- F. Measuring Corrosion Damage with Impression Materials. In the event the corrosion area is inaccessible for use of the dial depth gage the use of impression materials is recommended.
- (1) Clay. Modeling clay or similar materials may be used for making impressions of the corrosion damage. Accurate measurements of the depth of corrosion damage can be made by a comparator or other accurate measurement means.
 - (2) Silicone flexible mold compound rubber RTV 630A and RTV 630B from General Electric Co. (V01139) may be used to make impressions of corrosion damage and will be more permanent than the clay impressions. Measurements can be made by comparator or other accurate measurement means.
- G. Rework Limits. The maximum rework limitations should be determined from the criteria referenced in Volume 2. If no criteria are available and the damage is on primary structure, consult The Boeing Company. To ensure that allowable limits are not exceeded, an accurate measurement of the material removed or material remaining in the reworked area after fairing should be made. If the corrosion damage is in a previously worked area, the material removed must include the thickness remove during previous rework.

4. Corrosion Rework Preparations:

- A. Prior to starting any corrosion rework the airplane and the affected corrosion area must be prepared as outlined in the procedures below. Personnel performing these procedures shall observe all safety precautions for handling the materials used.
- (1) Position airplane in wash rack or provide apparatus which will permit rapid rinsing of all affected surfaces of the airplane.
 - (2) Statically ground the airplane (Ref Maintenance Manual Chapter 20).
 - (3) Removed or disconnect airplane batteries as required.
- NOTE: Some preventive maintenance procedures also require large quantities of water to be used, such as paint removal and alodizing. In these instances, disconnecting batteries is also prudent if there is electrical equipment in the area.
- (4) Protect the pitot-static openings, louvers, air scoops, engine openings, Landing gear, wheels, tires, magnesium skin panels, and airplane interior from moisture and chemical brightening agent.
 - (5) Protect surfaces, joints and seams adjacent to rework areas from chemical paint strippers, corrosion removers, and surface treatments.

5. Cleaning, General

- A. Prior to paint stripping and corrosion removal, if the corroded area or part is soiled by grease, dirt or other foreign material, the area should be cleaned. For general cleaning procedures refer to STRUCTURES, CHAPTER 51. Special cleaning procedures may be required in some cases. Precautions necessary when working with cleaning chemicals are noted in par. 2.

6. Paint Removal

- A. For general procedures, refer to STRUCTURES, CHAPTER 51. For special removal procedures, refer to the appropriate sections. For safety precautions when you use paint removal chemicals, refer to par. 2. above.

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7. Corrosion Removal Procedures

- A. Corrosion can be removed by mechanical or chemical procedures. Examples of mechanical procedures are hand sanding with abrasive paper or metal wool, power sanding or buffing with abrasive mats, grinding wheels or rubber mats, and abrasive blasting, which includes abrasive blasting with glass beads. The selection decision is different for different metals, different amounts of corrosion or the access to the area or part. In most corrosion removal operations, the mechanical procedures are recommended. The chemicals used in the chemical removal procedure can also cause corrosion and must not be permitted to flow into joints or seams or on highly stressed steel parts.
- B. If the area of corrosion includes or is near fasteners, remove the fasteners before you start to remove the corrosion. There could be corrosion under the fastener heads or in the holes. Corrosion removal around such fasteners without fastener removal will not stop the corrosion under the fasteners (Fig. 8). Also, metal from the fastener heads will be rubbed into the adjacent metal surface during the corrosion removal procedure, and can cause subsequent galvanic corrosion.
- C. Blending Repaired Areas. After corrosion removal, blend all depressions with the adjacent surface to keep stress concentrations to a minimum.
- (1) Remove rough edges and all corrosion from the damaged area. Make selection of the applicable abrasive.
 - (2) Repair depressions to make smooth, elliptical blend-outs as shown in Fig. 4. In areas with multiple pits close together, remove the material in between to keep surface irregularities or waviness to a minimum.
 - (3) In areas where sufficient clearance does not permit the elliptical shape as specified in Fig. 4 and 5, blend as nearly as possible to these dimensions and make the remaining area smoothly continuous, with no sharp or sudden changes.
 - (4) Remove all surface defects. Use the correct abrasive to get the necessary surface finish.
- D. Repair Depth Measurement. After you remove the corrosion and blend out the area, make depth measurements to be sure that the blend is not deeper than the repair limit. A dial depth gage or impression materials can be used to find the depth.
- E. Corrosion Removal - Mechanical.
- (1) The mechanical corrosion removal procedure is recommended for most cases of corrosion damage. Some examples of this procedure are: hand sanding with abrasive paper or metal wool, power sanding with abrasive mats, grinding wheels, wire brushes or rubber mats, carbide tipped scrapers and abrasive blasting. For general procedures, refer to the steps below. For details for the different metals, refer to par. 8 and on.
 - (2) Wire Brushing. Wire brushing is a mechanical abrasive operation unusually done with a hand wire brush or a wire brush mounted on a motordriven wheel. By using brushes of various lengths and gages of wire, a wide range of abrasive action is possible. Wire brushing is used to remove heavy corrosion and paint or dirt, especially where chemical treatment is impractical. A typical wire brushing procedure follows:
 - (a) Protect adjacent components from scale, chips, corrosion products and chemical agents.
 - (b) If you find grease or dirt, clean the area per par. 5.
 - (c) Remove any loose corrosion with a hand scraper.
 - (d) Wire brush area to a firm metal substrate.

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- (3) Grinding. Grinding is a method of removing heavy corrosion by means of motorized grinding wheels or abrasive belts. Part of the base metal is ground away with the corrosion. A typical grinding procedure follows:
 - (a) Protect adjacent components from scale, chips, corrosion products and chemical agents.
 - (b) If you find grease or dirt, clean the area per par. 5.
 - (c) Remove paint and corrosion by grinding until a firm corrosion free surface is reached. Continue grinding to remove coarse irregularities. Use fine abrasive paper to polish the surface to the desired finish.
- (4) Glass Bead Abrasive Blasting.
 - (a) Abrasive blasting is used to clean or finish metals and other materials. It hits the surface with a stream of abrasive particles. For corrosion removal, use glass bead abrasive blasting to remove only filiform corrosion. Do not use it to remove other types of corrosion that extend below the surface. Use standard blasting procedures and these special details
 - (b) In-cabinet Blasting. In-cabinet blasting is preferred. External gun blasting may be used if adequate confinement and recovery are provided for the abrasives.
 - 1) For the abrasive, use glass beads (150 mesh or finer).
 - 2) If possible, remove the part from the component. If this is not possible, give areas adjacent to the part protection from scale, chips, corrosion products and the abrasive blast.
 - 3) If you find grease or dirt, clean the area per par. 5.
 - 4) Give protection from the blast to such close tolerance surfaces as bushings, bearings, close tolerance shafts and threads.
 - 5) Remove only the corrosion products by abrasive blasting with glass beads.
 - (c) External Gun Blasting. The frequency of occurrence of filiform corrosion has led to the development of portable abrasive blasters. A typical external gun blasting procedure for removing filiform corrosion on aluminum skin follows:
 - 1) Remove any heavy soils with alkaline emulsion cleaner.
 - 2) Strip the protective finish (both enamel and primer).
 - 3) Mechanically remove the filiform corrosion by blasting with glass beads (approximately 150 mesh).
 - 4) After blasting, remove any enamel or primer that may remain in the corrosion cleanup area. Flush with water and clean the surface in preparation for surface treatment.
 - (d) Portable Abrasive Blaster. Filiform corrosion can be quickly removed by use of a portable abrasive blaster. An example is the Model E-10A Clemco Eductomatic Portable Blast Cleaner (Clemco Industries, V86192).
 - 1) The unit weighs 7 pounds and includes an abrasive reservoir (which holds up to 4 lb (1814 g) of glass beads) suction abrasive pickup, swivel blast nozzle and vacuum abrasive return.
 - 2) The blast head has a concentric arrangement. The inner tube blasts the glass beads against the airplane surface, and the outer passage retrieves the beads and dust and separates them. A double-acting control valve regulates both the blast and the suction. The blast head is connected by a swivel joint to the body of the unit. This feature lets you turn the blast in any direction and keep the main body of the machine vertical.

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- 3) During operation, control the air source to 80 psi (552 kPa) pressure maximum. Hold the blast nozzle on the surface to remove corrosion in an approximate one-inch diameter path. Try the equipment on a test panel to get to know the procedure.
- 4) The glass beads quickly remove corrosion (about 36 in. (914 mm) a minute) but almost none of the cladding on the aluminum surface.

F. Corrosion Removal - Chemical.

- (1) The chemical corrosion removal procedure can be used on the airplane where chemical flow can be controlled and the area can be fully washed with water. Because the chemicals used for corrosion removal can also cause corrosion, you must not let the chemicals become caught in such locations as lap joints, faying surfaces, or splices. On parts removed from the airplane, the chemical removal procedure could be better. The chemical agents used in corrosion removal are of the acid type. Because the chemicals are different for each metal details of the procedures are given in the applicable paragraphs that follow.

8. Corrosion Removal Procedures for Aluminum and Aluminum Alloys

A. General.

- (1) Aluminum and its alloys are the most frequently used materials in commercial airplanes. The metal is not toxic, not magnetic and because it can absorb large amounts of energy, it will not spark when hit by other metals. Although aluminum is high in the electrochemical series, it makes a tightly bonded anodic oxide film on the surface that gives more resistance to mild corrosive conditions. One sign of corrosion is a whitish deposit of corrosion products. General etching, pitting or roughness of the surface gives an indication of the start of corrosion damage.

B. Corrosion Removal

(1) Mechanical

- (a) Make sure the metal is aluminum.
- (b) Give adjacent areas protection to prevent more damage from corrosion products removed during mechanical removal.
- (c) If you find grease or dirt, clean the area per par. 5.
- (d) Remove paint per par. 6, if applicable.
- (e) Measure the amount of damage per par. 3.
- (f) Remove corrosion by one of the following:
 - 1) Remove light corrosion by light hand sanding with abrasive paper (Fig. 3).
 - 2) As an alternative, remove light corrosion and stains with pumice paste. Mix pumice powder with water to make a slurry paste. Apply with a clean, soft cloth and rub gently. When paste is dried to a white powder, wipe off with a clean, dry, soft cloth. Remove remaining corrosion and corrosion products with No. 600 grit wet or dry abrasive paper and water.
 - 3) Remove heavy corrosion products by hand with any of the following items:

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- a) Carbide-tipped scraper
- b) Fine fluted rotary file
- c) 400 grit aluminum oxide (alumina) abrasive paper
- d) Stainless steel brush (with bristles no larger than 0.010 in. (0.254 mm) in diameter)

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- < 1 > After you use the stainless steel brush or file, polish the surface with 400 grit alumina abrasive paper, and then with 600 grit alumina abrasive paper.
- 4) Mechanically remove moderate or bad corrosion by stainless steel wire brush (with bristles no larger than 0.010 in. (0.254 mm) in diameter), grinding, or, only for filiform corrosion, abrasive blasting with glass beads. Do not use glass bead abrasive blasting to remove other types of corrosion that extend below the surface. Refer to par. 7.E. for procedures. On nonclad anodized surfaces, be careful not to damage the anodized surface adjacent to the corrosion area.
 - 5) Dry abrasive blasting with glass beads (par. 7.E.(3)) is approved to remove only filiform corrosion from aluminum alloys. Do not use glass bead abrasive blasting to remove other types of corrosion that extend below the surface. Use air pressures of 40 psi (276 kPa) to 80 psi (552 kPa). The higher pressure removes corrosion more quickly.
- (g) After you remove all corrosion that can be seen through a 10-power magnifying glass, remove 0.002 in. (0.051 mm) more material to be sure you removed all the corrosion products.
 - (h) Blend repaired areas per par. 7.C.
 - (i) Clean the repaired area.
 - (j) Measure the depth of the blends per par. 7.D., to be sure that they are within repair limits.
 - (k) Treat the repaired area per PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING, PAGEBLOCK 51-21-21/701.
- (2) Chemical
- (a) Dilute the phosphoric acid base corrosion removing compound according to manufacturer's instructions. Mix the compound in wood, plastic or plastic lined containers. Do not add water to acid; always add acid to water.
 - (b) Apply diluted solution to corroded areas by spraying or with a sponge or brush. Apply with a circular motion, starting from lower surfaces and working upward to minimize runs and streaks.
 - (c) Leave the solution on from 5 to 30 minutes, depending on the temperature and the amount of corrosion present. Agitate occasionally with short fiber acid resistant brush. Do not allow solution to dry on the surface, as streaking will result.
 - (d) Rinse with a stream of water or wipe off with clean, moist cloth frequently rinsing the cloth in clear water.
 - (e) Dry area with clean, dry cloth and inspect area for corrosion.
 - (f) Repeat steps 3 thru 6 if any corrosion remains.
 - (g) Fair depressions resulting from rework per par. 7.C., and surface finish with 400 or 600 grit abrasive paper. Select proper abrasive.
 - (h) Clean reworked area.
 - (i) Determine depth of faired depression per par. 7.D., to ensure that rework depth limits have not been exceeded.
 - (j) Treat reworked surface as indicated in PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING, PAGEBLOCK 51-21-21/701.

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9. Corrosion Removal Procedures for Magnesium Alloys

A. Magnesium is lightweight, but is the most chemically active metal. It is highly susceptible to corrosion when failure of the protective coating has occurred. To preclude serious structural damage, early detection and prompt corrective action must be taken. The beginning of corrosion is indicated by a lifting of the paint film and white spots on the surface, which rapidly develop into snow-like mounds or whiskers. Procedures for corrosion removal by either mechanical or chemical methods are provided in the following paragraphs.

B. Corrosion Removal

(1) Mechanical

- (a) Positively identify the metal as magnesium.
- (b) Protect adjacent area to prevent additional corrosion damage from corrosion products removed during mechanical removal.
- (c) If grease or soil is present, clean the rework area per par. 5.
- (d) Strip paint per par. 6, if applicable.
- (e) Determine extent of damage per par. 3.
- (f) Remove loose corrosion products with aluminum wool.
- (g) Remove corrosion by one of the following:
 - 1) Light corrosion shall be removed by light hand sanding, selecting abrasive paper indicated.
 - 2) Light corrosion and stains may be removed with pumice paste. Prepare pumice paste by mixing pumice powder with water to form a slurry paste. Apply to stain, using a clean, soft cloth and rub gently. When paste has dried to a white powder, wipe off with a clean, dry, soft cloth. If corrosion products still exist, use No. 600 grit wet or dry abrasive paper and water to remove the remaining corrosion.
 - 3) Remove heavy corrosion products by hand scraping with any of the following items:

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- a) Carbide-tipped scraper
- b) Fine fluted rotary file
- c) 400 grit alumina abrasive paper
- d) Stainless steel brush (bristles of the brush not to exceed 0.010 in. (0.254 mm) in diameter)
 - < 1 > After use of the stainless steel brush or file, surface shall be polished with 400 grit alumina abrasive paper, then with 600 grit alumina abrasive paper.
- 4) Mechanically remove moderate or severe corrosion by stainless steel wire brush or abrasive blasting. Refer to par. 7.E., for procedures. Select appropriate abrasives from Fig. 3.

NOTE: Bristles of stainless steel wire brush should not exceed 0.010 in. (0.254 mm) in diameter.
- 5) Dry abrasive blasting is an approved method for corrosion removal from magnesium alloys. Refer to par. 7.E. Air pressures of 10 psi (69 kPa) to 35 psi (241 kPa) shall be used on magnesium alloy surfaces.

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- (h) After removing all corrosion visible through a 10-power magnifying glass, apply corrosion treating solution, refer to par. 9.C.(4), and wash thoroughly with clean water.
 - (i) Fair depressions resulting from rework per par. 7.C., and surface finish with 400 or 600 grit abrasive paper. Select appropriate abrasive material.
 - (j) Clean reworked area.
 - (k) Determine depth of faired depression per par. 7.D., to ensure that depth rework Limits have not been exceeded.
 - (l) Treat reworked area per PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING, PAGEBLOCK 51-21-21/701
- (2) Chemical.
- (a) Chromic acid solution may be used to remove surface oxidation and light corrosion products from magnesium surfaces. This method is not adequate where deep pitting or heavy corrosion have occurred which require mechanical methods of removal. If properly used, the chemical method causes less reduction in section thickness. Parts containing copper-based inserts shall not be treated with this method unless properly masked off. Excessive amounts of fluorides, sulfates, or chlorides must not be allowed to build up in the solution as these compounds tend to coat and etch the metal rather than clean the surface.
 - 1) Positively identify the metal as magnesium.
 - 2) Remove loose corrosion products with aluminum wool.
 - 3) Mask off other materials and parts, especially rubber parts, bearings, cast or pressed inserts, and plated steel to prevent contact with the treating solution or its fumes.
 - 4) Prepare corrosion treating solution. Two chemical preparations are available. To prepare the solutions, proceed as follows:
 - a) Chromium trioxide preparation
 - < 1 > To make 1.00 gal (3.79 l) of solution, add 24 oz (680 g) of chromium trioxide to water in a mixing container of lead lined steel, stainless steel or 1100 aluminum. Reaction time is 1 to 15 minutes when heated to 190°F (88°C) to 202°F (94°C). Longer reaction time is required when mixed at room temperature.
 - b) Sodium Dichromate/Nitric Acid Preparation. Prepare solution in the following portions: 1.5 lb (680.4 g) of sodium dichromate, 1.5 pt (709.8 ml) of concentrated nitric acid per 1.00 gal (3785.41 ml) of water. Mix as follows:

NOTE: The solution shall be prepared and stored in clean polyethylene or glass containers.

 - < 1 > Fill a suitable container with a volume of water equal to approximately 25 percent the desired total quantity of solution.
 - < 2 > Add full quantity of sodium dichromate in proportions indicated above and agitate until the chemical is dissolved.
 - < 3 > Add another volume of water until quantity of solution is equal to 66 percent the total desired quantity.
 - < 4 > Slowly add total volume of nitric acid to solution and mix thoroughly.
 - < 5 > Add water until total desired quantity of solution is reached and stir until entire solution concentration is equal.
 - < 6 > Remove corrosion by carefully applying the chromic acid solution to the corroded area with acid resistant brush.

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- <7> Allow the solution to remain on the surface approximately 15 minutes; agitate surface with brush. Wipe dry.
- <8> Rinse thoroughly with water while scrubbing the brush and wipe dry.
- <9> Repeat the preceding sequence as necessary until all corrosion products have been removed and a bright metallic color of the metal appears.
- <10> Fair depressions resulting from the rework per par. 7.C.
- <11> Surface treatment after corrosion removal per 20-50-00.

10. Corrosion Removal Procedures for Carbon Steel

A. Carbon steel in its heat-treated form is used in areas where high structural or aerodynamic loads occur on the airplane. Landing gear, flap tracks, structural splices, terminal fittings and miscellaneous brackets are some of the typical parts made from heat-treated carbon steel. Red iron rust is one of the most familiar kinds of corrosion on carbon steel and generally caused from formation of ferrous oxides due to atmospheric exposure. Some surface metal oxides are purposely used to protect the underlying base metal. Red iron rust is not one of these and actually attracts moisture from the air and promotes additional corrosion. The red rust first shows on unprotected airplane hardware such as bolts, nuts and exposed fittings. Slight corrosion damage on highly stressed steel parts becomes potentially dangerous and the rust shall be removed and controlled. Corroded steel parts should be removed from the airplane for treatment if possible. The general procedures for corrosion removal are provided in the following paragraphs.

B. Corrosion Removal

(1) Mechanical

- (a) Positively identify the metal as steel and determine its heat-treat value.
- (b) Protect adjacent area to prevent additional corrosion damage from corrosion products removed during mechanical removal.
- (c) If grease or soil is present, clean the rework area per par. 5.
- (d) Strip paint per par. 6, if applicable.
- (e) Corrosion removal on steels heat-treated to 220,000 psi and above shall be accomplished by dry abrasive blasting as outlined in par. 7.E., with blasting pressure ranging from 40 psi (276 kPa) to 70 psi (483 kPa) or hand tools described in par. 7.E.
- (f) Mechanically remove all corrosion from steel parts heat-treated below 220,000 psi as follows:
 - 1) Remove heavy corrosion products using stainless steel hand brush. Use dry abrasive blasting per 7.E., as an alternate method with blasting pressures ranging from 40 psi (276 kPa) to 70 psi (483 kPa).
 - 2) Remove residual corrosion by hand sanding or with approved hand operated power tool as outlined in par. 7.E. Select appropriate abrasives.
- (g) Make visual check through a 10-power magnifying glass to ensure that all corrosion is removed.
- (h) Fair depressions resulting from reworked per par. 7.C., and surface finish with 400 grit abrasive paper selected.
- (i) Clean reworked area.
- (j) Determine depth of faired depression per par. 7.D., to ensure that rework depth limits have not been exceeded.
- (k) Treat reworked area as indicated in PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING, PAGEBLOCK 51-21-21/701 immediately upon finish of rework.

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(2) Chemical.

(a) Chemical rust removers are of either the acid or alkaline type. The acid type is intended for use in removing the rust or black oxide formations by either immersion or brush application of the chemical. The alkaline type is intended for use in removing red rust by immersion treatment. Procedures for the use of both types of rust removers are provided below.

1) Inhibited Phosphoric Acid Base Rust Remover.

a) Brush-on Method

- < 1 > Positively identify the metal as steel.
- < 2 > Protect adjacent area to prevent additional damage from the chemical agents.
- < 3 > If grease or soil is present, clean the corrosion area per par. 5.
- < 4 > Remove heavy rust by chipping an/or wire brushing with stainless steel bristle brush.
- < 5 > Dilute the concentrated acid according to manufacturer's instructions in acid resistant mixing container. Do not add water to acid; always add acid to water.
- < 6 > Apply the acid mixture to corroded area with acid-resistant brush. Allow to remain long enough to loosen rust (2 to 10 minutes) and rinse completely with clean water.
- < 7 > Examine corroded area visually with 10-power magnifying glass.
- < 8 > If corrosion is still evident, repeat application and rinse thoroughly
- < 9 > After removal is complete, blend or fair area affected per par. 7.C.
- < 10 > Determine depth of faired depressions per par. 7.D., to ensure that rework limits have not been exceeded.
- < 11 > Treat surface of reworked area per PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING, PAGEBLOCK 51-21-21/701 immediately upon finish of rework.

b) Immersion Method

NOTE: This method is to be used for removing heavy rust from parts removed from the airplane and where the corroded area can be completely immersed.

- < 1 > Positively identify the metal as steel.
- < 2 > If grease or soil is present, clean the corrosion area per par. 5.
- < 3 > Remove heavy rust by chipping an/or wire brushing with stainless steel wire brush.
- < 4 > Prepare the acid mixture per step (1)(e).
- < 5 > Immerse the parts in acid solution only long enough to loosen the rust. The solution may be heated to a maximum of 104°F (40°C) to increase the removal rate. Agitation will also help.
- < 6 > Rinse in continuously flowing cold water rinse tank or flood with clean water.
- < 7 > Visually examine the corrosion area with 10-power magnifying glass.
- < 8 > If corrosion still exists, repeat immersion steps.
- < 9 > After removal is complete, fair or blend the reworked area per par. 7.C.

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- < 10 > Determine depth of faired depression per par. 7.D., to ensure that rework depth limits have not been exceeded.
- < 11 > Treat surface of reworked area per PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING, PAGEBLOCK 51-21-21/701 immediately upon finish of rework.
- c) Alkali Type Rust Remover
 - < 1 > Positively identify the metal as steel.
 - < 2 > Protect adjacent components to prevent damage from the chemical agents, chips, scales, or corrosion products.
 - < 3 > Remove grease and soil from corrosion damage area per par. 5.
 - < 4 > Remove heavy rust by chipping and/or wire brushing with stainless steel bristle brush.
 - < 5 > Prepare alkali base rust remover solution per manufacturer's instruction. Carbon steel or corrosion resistant steel tanks may be used.
 - < 6 > Immerse parts in rust remover solution. Temperature up to the boiling point of the solution may be used to increase the rate of removal.
 - < 7 > Rinse thoroughly in clean water.
 - < 8 > Visually examine for complete corrosion removal with a 10-power magnifying glass.
 - < 9 > If corrosion still exists, repeat immersion procedure above.
 - < 10 > Dry thoroughly and fair or blend depressions from corrosion removal per par. 7.C.
 - < 11 > Determine depth of faired depression per par. 7.D., to ensure that rework depth limits have not been exceeded.
 - < 12 > Treat surface of reworked area per PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING, PAGEBLOCK 51-21-21/701 immediately upon finish of rework.

11. Corrosion Removal Procedure for Stainless Steel and Nickel-Chromium Alloys

- A. Stainless steel and nickel-chromium alloys are used where corrosion resistance is one of the major considerations in the design of the component or system. In most applications, these steels will have no other surface protection except for matching color schemes of the surrounding structure or dissimilar metal organic coatings. Stainless steel and nickel chromium steels, however, are not free from corrosion attack. Corrosion usually appears as pits usually black in color. The existence of corrosion products prevents a passivated environment at the stainless steel surfaces and creates an active/passive corrosion cell (IDENTIFICATION TYPES AND CAUSES, SUBJECT 51-00-50). It is, therefore, necessary that the corrosion removal is complete.
- B. Corrosion Removal
 - (1) Mechanical
 - (a) Use the same general procedures as for carbon steel.
 - (2) Chemical.
 - (a) In severely corroded areas and where chemical agents will not be trapped in cracks, crevices, lap joints, etc., the chemical removal methods described for carbon steel are applicable.

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12. Corrosion Removal Procedure for Titanium Alloys

- A. Titanium alloys are used in several locations in the airplane, particularly in high-temperature areas and in areas where high-strength members are exposed to corrosive environment. Exposure of the titanium surface to fire resistant hydraulic fluids such as BMS 3-11 causes hydrogen embrittlement subsequently leading to pitting of the surface. The alloy is generally corrosion resistant. Corrosion, however, does appear as white or black color oxides. Corrosion removal shall be accomplished per the following procedures:
- B. Corrosion Removal
- (1) Mechanical
 - (a) If grease or soil is present, clean the area per par. 5.
 - (b) Hand polish with aluminum polish with a soft cloth until all traces of corrosion or surface deposits are removed.
 - (c) Remove the polish with soft cloth.
 - (d) Treat reworked area per PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING, PAGEBLOCK 51-21-21/701.
 - (2) Chemical
 - (a) Because titanium is susceptible to hydrogen embrittlement when exposed to acid solutions, chemical corrosion removers are not permitted.

13. Corrosion Removal Procedures for Plated or Phosphated Surfaces

- A. Metal parts are plated either to provide a smooth surface for wear resistance or to provide a sacrificial metal to protect the base metal. Phosphate treatments on metal surfaces provides a good adhesion surface for organic finishes and provides good wear and corrosion resistance when used with oil or corrosion preventive compounds. Cadmium plating corrosion will appear as a dull gray product. Phosphate treated surfaces will appear as a red-black part darker than common rust when corroded.
- B. Corrosion Removal from Cadmium Plated Surfaces
- (1) Protect adjacent areas from contaminants during corrosion removal.
 - (2) If grease or soil is present, clean area per par. 5.
 - (3) If corrosion appears only on the plated surfaces, rework as follows:
 - (a) Remove corrosion products by rubbing lightly with stainless steel wool. Limit rework area to a minimum so that plating material in adjacent area is preserved.
 - (b) Apply chromic acid solution to the corroded area and allow to remain on surface for 30 to 60 seconds. The solution strength shall be 4 oz (113 g) of chromium trioxide to 1.00 gal (3.79 l) of water.
 - (c) Rinse with clean water and air dry.
 - (4) If corrosion has penetrated to the base metal, rework as follows:
 - (a) Determine from SRM if part shall be reworked or replaced.
 - (b) If part can be reworked, identify the base metal and remove corrosion per applicable procedures.
 - (5) Treat rework surface per PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING, PAGEBLOCK 51-21-21/701.
- C. Corrosion Removal from Plated Surfaces (Except Cadmium Plated Surfaces)
- (1) Protect adjacent areas from contaminants during corrosion removal.
 - (2) If grease or soil is present, clean area per par. 5.

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- (3) Remove heavy corrosion by mechanical method per par. 7.E.
- (4) Remove remaining corrosion using phosphoric acid base rust remover (mixed on a 1:1 ratio). Allow acid solution to remain only long enough to remove the corrosion.
- (5) Thoroughly rinse the acid from the surface with clean water.
- (6) Air dry and treat the reworked surface per PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING, PAGEBLOCK 51-21-21/701.

D. Corrosion Removal from Phosphated Surfaces

- (1) Phosphated cadmium surfaces shall be treated per procedures for cadmium plated surfaces.
- (2) Phosphated ferrous alloys shall be treated per procedures for carbon steel.

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PROCEDURE AFTER MERCURY SPILLAGE - MAINTENANCE PRACTICES

1. General

- A. The corrosive action of mercury is very rapid; consequently, immediate action must be taken when mercury spillage has been discovered.
- B. Mercury amalgamates readily with aluminum alloys at room temperature if the oxide film on the aluminum has been scratched or damaged. Once a small area of aluminum has been amalgamated, corrosion occurs. This process is accelerated by moisture and particularly by salt water.
- C. The amalgamation of stressed aluminum structure may also result in rapid cracking similar to stress corrosion cracking.
- D. Mercury is not consumed in the amalgamation process. As the aluminum oxidizes, it separates from the amalgam and the mercury continues to attack fresh aluminum.
- E. The presence of organic finishes, greases or a thick continuous oxide layer retards the amalgamation process.
- F. Do the steps in MERCURY SPILLAGE CONDITION - MAINTENANCE PRACTICES (CONDITIONAL INSPECTION), PAGEBLOCK 05-51-14/201 on the procedures on the removal of mercury

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PROCEDURE AFTER FIRE DAMAGE - MAINTENANCE PRACTICES

1. General

- A. Service experience has indicated that corrosion problems can occur if fire damaged areas are not immediately cleaned. The sooty deposits resulting from burning organic materials and the residue from the use of dry powder type fire extinguishers are the sources of contaminants that may initiate corrosion in metal systems and structure.
- B. The dry powder type fire extinguishers are considered very effective in combatting airplane fires. The powder from extinguishers of this type is decomposed by heat to form carbon dioxide. The residual deposit, however, is hygroscopic and forms sodium hydroxide when moisture is absorbed from the air or mixed with water from airplane flushing. Sodium hydroxide is alkaline and can cause corrosion damage to aluminum structure, electrical components, etc. Use large quantities of water for flushing in every compartment, crevice and corner, and behind electrical panels to eliminate all traces of this rather insoluble white powder.
- C. BCF and similar halogen type fire extinguishers normally leave no chemical residue to corrode parts or surfaces. However, when subjected to flame or hot surfaces, halogenated agents can decompose to produce small amounts of halogen acids.

TASK 51-00-55-200-801

2. Preventive Maintenance

A. References

Reference	Title
51-21-11 P/B 701	PAINT STRIPPING - CLEANING/PAINTING
51-21-31 P/B 701	CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING
51-21-91 P/B 701	CORROSION INHIBITING COMPOUND - CLEANING/PAINTING
737 NDT Part 6, 51-00-00, Figure 3	Investigation of Fire Damage on Aircraft Structure

B. Consumable Materials

Reference	Description	Specification
B00081	Solvent - Trichloroethylene	BMS11-6
B01000	Solvent - General Cleaning Of Metal (AMM 20-30-801/201) - Series 80	

C. Procedure

SUBTASK 51-00-55-020-001

(1) After the fire is out, do these steps:

- (a) Remove fire damaged interiors to expose structure. This includes interior trim, seats, passenger service units, linings, insulations, galleys, etc. Removal of tubing, cables, electrical wiring, etc., is not necessary if they are unaffected.
- (b) Screen or mask off areas not affected.
- (c) Open all drains, hatches and doors for drainage and ventilation. Use compressed air to blow dry all hidden recesses.

SUBTASK 51-00-55-200-001

(2) Examine the structure for these items:

- (a) Heat damage, soot, fire extinguishing material residue and corrosion.
- (b) Paint discoloration indicates temperature had exceeded 350°F (177°C) and .

NOTE: Structural analysis required if temperature exceeds 350°F (177°C).

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- (c) Look for acid contamination of the structure, control cables and wire bundles with litmus paper.

NOTE: Products of combustion or decomposed fire extinguishants may combine with moisture to form corrosive chemicals.

- (d) Flush the structure with water when necessary to remove contamination.

SUBTASK 51-00-55-030-001

- (3) Remove and replace structure damaged beyond repair.

NOTE: Use Investigation of Fire Damage on Aircraft Structure, 737 NDT Part 6, 51-00-00, Figure 3 to determine any change in heat-treat of any suspect structure.

SUBTASK 51-00-55-100-001

- (4) Remove soot by washing affected areas with Series 80 solvent, B01000solvent, B00081. Pressure gun application is suggested for flushing fay surface joints, such as stringers to body skins. An absorbent cloth held beneath the area will catch the contaminated solvent.

SUBTASK 51-00-55-280-001

- (5) Inhibit corrosion that could be caused by residue from the dry powder fire extinguisher by washing affected areas with a 10-percent-by-weight solution of sodium dichromate. The dichromate solution acts as a mild corrosion inhibitor. Thoroughly dry all treated surfaces before continuing with any other treatment. Repeat rinse and inhibition treatment if any white residue shows.

NOTE: Any remaining liquid dichromate solution will weep through seams and fastener holes during cabin pressurization and could subsequently discolor the exterior paint finish. Forced hot air used to dry the area may be necessary before further flight if humidity is high.

SUBTASK 51-00-55-211-001

- (6) Look for remaining contamination behind clips, brackets, nutplates.

SUBTASK 51-00-55-200-002

- (7) After removal of contamination, do the steps in CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING, PAGEBLOCK 51-21-31/701 when corrosion is found.

SUBTASK 51-00-55-370-001

- (8) When corrosion is removed, do the steps in PAINT STRIPPING - CLEANING/PAINTING, PAGEBLOCK 51-21-11/701.

SUBTASK 51-00-55-600-001

- (9) To apply the corrosion inhibiting compound, do the steps in CORROSION INHIBITING COMPOUND - CLEANING/PAINTING, PAGEBLOCK 51-21-91/701.

SUBTASK 51-00-55-741-001

- (10) Put the Airplane Back to Its Usual Condition.

————— **END OF TASK** —————

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PROCEDURE AFTER ALKALINE SPILLS - MAINTENANCE PRACTICES

1. General

- A. This procedure has these two tasks:
 - (1) Detection and Isolation of Alkaline Contaminated Area.
 - (2) Alkaline Spillage Cleanup.
- B. Alkaline spills are caustic and can cause corrosive damage to airplane structure unless neutralized.
- C. The primary source of alkaline spillage is in the battery compartments where alkaline electrolytes may overflow during charging or spill during battery servicing.
- D. Alkali-based corrosion removal compounds and airplane cleaners are used quite extensively during routine maintenance operations. Without thorough neutralizing and/or rinsing, a spilled alkaline compound can produce corrosion damage.
- E. Containers of alkaline compounds may be part of a cargo and may be broken during loading or unloading. Spillage from such sources are usually larger in scale than battery electrolyte spills. It is therefore recommended that the neutralization of the alkaline be accomplished as soon as possible.

TASK 51-00-56-211-801

2. Detection and Isolation of Alkaline Contaminated Area

A. Consumable Materials

Reference	Description	Specification
G50305	Sheeting - Plastic, Polyethylene	

B. Procedure

SUBTASK 51-00-56-211-001

(1) Do this step for detection of alkaline contamination:

- (a) Alkalines are clear and are not color detectable.
 - 1) A white powdery deposit (aluminum oxide) would indicate corrosion on aluminum structure.

NOTE: Around the top of nickel-cadmium battery cells, the alkaline electrolyte that has overflowed the vent caps reacts with the carbon dioxide in the air and produce a white powdery deposit. This white deposit is not corrosive and otherwise harmless but is an indication that electrolyte has spilled or otherwise escaped.

SUBTASK 51-00-56-160-001

(2) On discovery of alkaline spills, steps should be taken to contain the contaminated area. The following precautions are advised:

- (a) Do not allow alkaline spills to spread to adjacent areas that will not be cleaned.
- (b) In battery areas, protection of equipment beneath using plastic sheeting, G50305 is advised. If equipment is operating, venting should be maintained.
- (c) Consider protecting uncontaminated areas by taping down protective material such as plastic sheeting, G50305.

————— **END OF TASK** —————

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TASK 51-00-56-100-801

3. Alkaline Spillage Cleanup

A. References

Reference	Title
51-21-11 P/B 701	PAINT STRIPPING - CLEANING/PAINTING
51-21-31 P/B 701	CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING
51-21-91 P/B 701	CORROSION INHIBITING COMPOUND - CLEANING/PAINTING

B. Consumable Materials

Reference	Description	Specification
B00636	Acid, Acetic (Vinegar)	JAN-A-465
G00116	Sponge - Synthetic	
G00215	Brush - Soft Bristle Fiber	
G01659	Swab - Disposable, Cotton Or Rayon Applicator	GG-A-616
G50256	Water, Regular	
G50305	Sheeting - Plastic, Polyethylene	
G50316	Cloth - Clean, Dry, Lint-free, White, Cotton	

C. Procedure

SUBTASK 51-00-56-913-001

- (1) If equipment is adjacent to the treatment area, use plastic sheeting, G50305 to cover the equipment to prevent inadvertent splashing of alkalines or treatment fluids

SUBTASK 51-00-56-100-001

- (2) Wipe up excess fluids with cotton cloth, G50316 and discard cloth into plastic container for disposal.

SUBTASK 51-00-56-561-001

- (3) Do these steps to neutralize alkaline contamination:
 - (a) Neutralize the treatment area with a 5 percent acid, B00636 solution or full strength household vinegar applied with a brush, G00215, cotton cloth, G50316 or swab, G01659.
 - (b) Continue to apply the solution until bubbles cease. Then allow the solution to remain on the surface for an additional 5 minutes.
 - (c) Remove the neutralized mixture with a cotton cloth, G50316 or sponge, G00116.
 - (d) Rinse the affected area with generous quantities of clean water, G50256. Occasionally agitate the surface with a brush, G00215.
 - (e) Neutralization of the alkaline fluid should be determined with litmus paper.
 - (f) Wipe dry with clean cotton cloth, G50316.

SUBTASK 51-00-56-350-001

- (4) After removal of contamination, do the steps in CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING, PAGEBLOCK 51-21-31/701 when corrosion is found.

SUBTASK 51-00-56-370-001

- (5) When corrosion is removed, do the steps in PAINT STRIPPING - CLEANING/PAINTING, PAGEBLOCK 51-21-11/701, if necessary.

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SUBTASK 51-00-56-600-001

- (6) To apply the corrosion inhibiting compound, do the steps in CORROSION INHIBITING COMPOUND - CLEANING/PAINTING, PAGEBLOCK 51-21-91/701.

SUBTASK 51-00-56-741-001

- (7) Put the Airplane Back to Its Usual Condition.

————— **END OF TASK** —————

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PROCEDURE AFTER ACID SPILLS - MAINTENANCE PRACTICES

1. General

- A. This procedure has these two tasks:
(1) Detection and Isolation of Acid Contaminated Area.
(2) Acid Spillage Cleanup
B. Acid spills, unless neutralized, can rapidly corrode metallic structure.
C. The primary source of alkaline spillage is in the battery compartments where acid electrolytes may overflow during charging or spill during battery servicing.
D. Acid-based corrosion removal compounds and airplane cleaners are used quite extensively during routine maintenance and repair. Spills do occur at times and thorough neutralizing and/or rinsing is necessary to preclude corrosion damage.
E. Containers of acid concentrates or acid based chemicals may be part of a cargo and may be broken during loading or unloading. Spillage from such sources are usually larger in scale than battery electrolyte or maintenance servicing chemical spills mentioned in par. B and C. It is, therefore, advisable that the acid spillage be neutralized as soon as possible.
F. Operators should also be aware of the fact that acids may deteriorate nonmetallic materials such as fabrics, wood, leather, etc.
G. The FAA has required the removal of all lithium sulfur dioxide batteries from all U.S. civil aircraft. This is due to the fact that many incidents have been reported in which lithium sulfur dioxide batteries have burned or vented violently. Some batteries have also leaked sulfur dioxide gas, which combines with moisture to form extremely corrosive sulfurous acid.

TASK 51-00-57-211-801

2. Detection and Isolation of Acid Contaminated Area

A. Consumable Materials

Table with 3 columns: Reference, Description, Specification. Row 1: G50305, Sheeting - Plastic, Polyethylene

B. Procedure

SUBTASK 51-00-57-211-001

- (1) Do this step for detection of acid contamination:
(a) Examine for discoloration the surface for acid contamination.
1) Black, white, yellow and brown are predominant chemical reaction precipitate colors.

NOTE: Precipitate colors depend on the acid and the material on which the acid is spilled

SUBTASK 51-00-57-160-001

- (2) On discovery of acid spills, steps should be taken to contain the contaminated area. The following precautions are advised:
(a) Do not allow acid spills to spread to adjacent areas that will not be cleaned.
(b) In battery areas, protection of equipment beneath using plastic sheeting, G50305 is advised. If equipment is operating, venting should be maintained.
(c) Consider protecting uncontaminated areas by taping down protective material such as plastic sheeting, G50305.

END OF TASK

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TASK 51-00-57-100-801

3. Acid Spillage Cleanup

A. References

Reference	Title
51-21-11 P/B 701	PAINT STRIPPING - CLEANING/PAINTING
51-21-31 P/B 701	CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING
51-21-91 P/B 701	CORROSION INHIBITING COMPOUND - CLEANING/PAINTING

B. Consumable Materials

Reference	Description	Specification
B00095	Compound - Sodium Bicarbonate	ASTM D928
G00116	Sponge - Synthetic	
G00215	Brush - Soft Bristle Fiber	
G50256	Water, Regular	
G50305	Sheeting - Plastic, Polyethylene	
G50316	Cloth - Clean, Dry, Lint-free, White, Cotton	

C. Procedure

SUBTASK 51-00-57-913-001

- (1) If equipment is adjacent to the treatment area, use plastic sheeting, G50305 to cover the equipment to prevent inadvertent splashing of acids or treatment fluids

SUBTASK 51-00-57-100-001

- (2) Wipe up excess fluids with cotton cloth, G50316 and discard cloth into plastic container for disposal.

SUBTASK 51-00-57-561-001

- (3) Do these steps to neutralize acid contamination:
 - (a) Neutralize the treatment area with a 20 percent sodium bicarbonate solution applied with a brush or cloth swab. Particular attention should be given to faying surface joints. Pressure application may be required to flush the joint thoroughly.

NOTE: 16 oz (454 g) of compound, B00095 in 1.00 gal (3.79 l) of water, G50256 will give the desired mixture.

- (b) Continue to apply the solution until bubbles cease. Then allow the solution to remain on the surface for an additional 5 minutes.
- (c) Remove the neutralized mixture with a cotton cloth, G50316 or sponge, G00116.
- (d) Rinse the affected area with generous quantities of clean water, G50256. Occasionally agitate the surface with a brush, G00215.
- (e) Neutralization of the acidic fluid should be determined with litmus paper.
- (f) Wipe dry with clean cotton cloth, G50316.

SUBTASK 51-00-57-350-001

- (4) After removal of contamination, do the steps in CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING, PAGEBLOCK 51-21-31/701 when corrosion is found.

SUBTASK 51-00-57-370-001

- (5) When corrosion is removed, do the steps in PAINT STRIPPING - CLEANING/PAINTING, PAGEBLOCK 51-21-11/701, if necessary.

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SUBTASK 51-00-57-600-001

- (6) To apply the corrosion inhibiting compound, do the steps in CORROSION INHIBITING COMPOUND - CLEANING/PAINTING, PAGEBLOCK 51-21-91/701.

SUBTASK 51-00-57-741-001

- (7) Put the Airplane Back to Its Usual Condition.

————— **END OF TASK** —————

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STANDARD TREATMENT METHODS - MAINTENANCE PRACTICES

1. General

- A. In order to preclude the occurrence or recurrence of corrosion after corrosion removal or corrosion damage repair, the exposed surfaces of most metals must be immediately treated after rework. These treatments include conversion coating, plating or the application of thin protective film, i.e., oil or primer, over the base metal. The conversion coatings and primer application also enhance the surface adhesion qualities for painting, if required. Some metals, such as stainless steel and titanium, which are basically corrosion resistant do not require surface protection except for painting to match the surrounding structure, or in dissimilar metal applications when plating, painting or sealing becomes necessary.
- B. Corrosion Prevention. Although the surface finish has been restored by the treatment methods in this section to minimize the recurrence of corrosion, service experience indicates it would be advantageous to apply a corrosion inhibiting compound over the surface finish in the more susceptible areas. Refer to the applicable sections of Volume 2.

2. Surface Treatment for Aluminum and Aluminum Alloys

A. General.

- (1) Aluminum and its alloys quickly forms an invisible protective oxide film on the surface when exposed to atmosphere. The oxide will provide corrosion protection in mild environment, but since the reworked area is in a corrosion prone area further protection is required.

B. Surface Treatment.

- (1) All aluminum surfaces that have been reworked per STRUCTURES - CORROSION INSPECTIONS - MAINTENANCE PRACTICES, PAGEBLOCK 51-05-01/201 or should be cleaned and have a conversion coating applied. The coating materials chemically convert the aluminum surface into a very thin 0.00001 in. (0.00025 mm) to 0.00005 in. (0.00127 mm) non-metallic chromate film as an integral part of the metal. This film is resistant to corrosion and an excellent adherent for subsequent priming. The conversion coating can be applied by alodizing or by Iridite treatment. Solutions used in both treatments are proprietary but are readily available through most sources handling chemicals. There are several alodizing chemicals and the treatment procedure for each is presented below. The treatment procedure for Iridite is also included.

C. Alodizing.

- (1) The alodizing chemicals used for treatment are:
- (a) Alodine 1200 or 1200S (colored film)
 - (b) Alodine 1000, 1000L or 1500 (clear film)
 - (c) Nitric Acid
- (2) The colored film of parts treated with Alodine 1200 or 1200S will vary from light golden iridescent to gold-brown. Parts treated with Alodine 1000, 1000L or 1500 will have no color. For most applications Alodine 1200 or 1200S is recommended. (If the parts have BMS 10-20 primer, use only Alodine 600 because other coating materials, such as Alodine 1200 or 1200S, can cause a powdery coating if applied on cured BMS 10-20 primer. Treatment of reworked areas may be accomplished either by immersion where parts are removed from the airplane or by manual coating methods.

D. Solution Preparation.

- (1) All solutions except Alodine 1000 or 1000L shall be made up in and contained in stainless steel tanks or in tanks lined with acid resistant plastic or rubber. Alodine 1000 and 1000L solutions may be made up in and contained in mild steel tanks.

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- (2) The cleaned tank shall be half filled with make-up water. Sprinkle the powder chemicals uniformly over the surface or pour the liquid chemicals along the length of the tank, stir the solution until chemicals are completely dissolved or liquids are completely mixed, then add water to volume.
- (3) For large, long tanks, longitudinal agitation is recommended to keep solution concentrations uniform.
- (4) Prepare Alodine 1200 and 1200S solutions for immersion application in accordance with proportions and control shown in Fig. 1, Sheet 1.
- (5) Prepare Alodine 1000, 1000L and 1500 solutions for immersion applications in accordance with proportions and control shown in Fig. 1, Sheet 2.
- (6) Prepare Alodine solutions for manual application in accordance with instructions in Fig. 2.

E. Alodine Surface Treatment

- (1) Wipe with dry clean cheesecloth to remove base particles and residue from the treatment area.
- (2) Wipe with cheesecloth dampened (not saturated) with solvent, series 88 (Ref. SOPM 20-30-88). Repeat using clean cheesecloth until no visible residue transfers to the cheesecloth.
- (3) Allow to dry for a minimum of 15 minutes.

NOTE: Water break test may be used to determine cleanliness. In this method a mist of distilled water is atomized on the surface to be coated. If the water gathers and forms into droplets within 25 seconds the surface shall be considered as failing the test. If the water forms a continuous film by flashing out suddenly over a large area the surface shall also be considered as having failed the cleanliness test because of impurities on the surface. If the water drops coalesce into a continuous film of water without a sudden flash and forms a lens, then the surface shall be considered as having satisfactorily passed the water break test.

- (4) Mask off dissimilar metal inserts, except chromium, nickel, corrosion resistant steel, or titanium.
- (5) Immersion Application. Immerse part in alodine-solution for 2 to 6 minutes. Use a test sample to find the correct immersion time.
- (6) Manual Application
 - (a) Apply the alodine solution to the cleaned metal surface by brush, swab, swatches of saturated blotting paper, or a clean cellulose sponge.
 - (b) Allow solution to act on surface 1 to 5 minutes until coating is formed. Coating time will depend on temperature of the part. Maintain a continuous wet film on surface of work area.
 - (c) Where difficulty is experienced in the formation of the coating, lightly abrading with a fine or very fine aluminum oxide nylon mat soaked with the solution will help.
 - (d) Dirty surfaces may not take coating and will require rinsing off the solution, cleaning and reapplication.
 - (e) Areas with powdery coating shall be recoated with fresh solution.
- (7) Remove excess alodine by thoroughly flushing with clean water, then allow to dry at ambient temperature. Force air dry if possible.
- (8) Apply original finish.
- (9) Remove masking and protective covering.

F. Iridite Treatment.

- (1) The chemicals used in the Iridite treatment are:
 - (a) Iridite 14

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- (b) Iridite 14-2
 - (c) Nitric Acid.
- (2) Iridite treating can be controlled by length of time solution is applied to give a yellow or a clear coating. Treatment of reworked areas may be accomplished either by immersion or by manual coating methods.
- (a) Solution Preparation
 - 1) All compressed air used for solution agitation or for drying parts shall be filtered to remove oils and solid particles.
 - 2) All containers for Iridite solution shall be fabricated from or lined with stainless steel or plastic. Some suitable plastic materials are polyethylene, Koroseal, Tygon, Lucoflex and Lucite.
 - 3) Slowly add the Iridite powder to room temperature water by required concentration. Agitate the solution (clean filtered air is satisfactory) until all soluble material is dissolved.
 - 4) Prepare Iridite 14 and Iridite 14-2 solutions for immersion or manual applications in accordance with proportions and control shown in Fig. 3.
 - (b) Iridite Surface Treatment
 - 1) Wipe with dry clean cheesecloth to remove loose particles and residue from the treatment area.
 - 2) Wipe with cheesecloth dampened (not saturated) with solvent, series 88. Repeat using clean cheesecloth until no visible residue transfers to the cheesecloth.
 - 3) Allow to dry for a minimum of 15 minutes.
 - NOTE:** The water break test may be used to determine cleanliness. In this method a mist of distilled water is atomized on the surface to be coated. If the water gathers and forms into droplets within 25 seconds the surface shall be considered as failing the test. If the water forms a continuous film by flashing out suddenly over a large area the surface shall also be considered as having failed the cleanliness test because of impurities on the surface. If the water drops coalesce into a continuous film of water without a sudden flash and forms a lens, then the surface shall be considered as having satisfactorily passed the water break test.
 - 4) Mask off dissimilar metal inserts, except chromium, nickel, corrosion resistant steel, or titanium.
 - 5) Immersion Application. Immerse part in Iridite solution for 1 to 6 minutes until the desired coating is obtained. The use of test sample is recommended to ascertain the correct immersion time.
 - NOTE:** The Iridite solution will accumulate sludge. In no case shall the depth of the sludge be allowed to reach a point where it touches the work.
 - 6) Manual Application.
 - a) Apply the Iridite solution liberally and evenly with a nylon brush, cotton swab, cellulose sponge or white blotting paper.
 - b) Maintain a continuous wet film for 3 to 6 minutes if a yellow coating is required and from 30 seconds to 3 minutes if a clear coating is required.
 - 7) Remove excess Iridite by thoroughly flushing with clean water, then allow to dry at ambient temperature. Force air dry if possible.

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- 8) All powder visible on parts after treatment shall be wiped off the dry parts with clean dry rags.
- 9) Apply original finish.
- 10) Remove masking and protective covering.

3. Surface Treatment for Magnesium Alloys

A. General

- (1) Magnesium alloys are highly susceptible to corrosion when the metal surface is exposed without a protective finish. An oxide-carbonate film will normally form on an exposed magnesium alloy surface but this surface provides very little protection against corrosion. A proper protective finish is therefore required.

B. Surface Treatment.

- (1) All magnesium alloy surfaces that have been reworked per STRUCTURES - CORROSION INSPECTIONS - MAINTENANCE PRACTICES, PAGEBLOCK 51-05-01/201 or applicable methods shall be cleaned and treated with a conversion coating. The coating materials convert the magnesium alloy surface into an inhibitive passive layer on the base metal that resists corrosion. This coating is applied using the brush-on technique.

(a) Solution Preparation

- 1) The chemicals used for the solution are:
 - a) Chromic Acid (CrO₃)
 - b) Calcium Sulfate (CaSO₄.2H₂O)
- 2) The solution shall be prepared and stored in polyethylene or glass containers.
- 3) Prepare the solution using the following proportions and control. The chemicals shall be added to the water in the order given below.
 - a) Chromic Acid 1.3 oz/gal
 - b) Calcium Sulfate 1 oz/gal
 - c) Distilled Water to make 1 gal
 - d) pH 1.2-1.6

NOTE: Adjust pH with additions of sodium hydroxide or sulfuric acid as required.

- 4) Vigorously stir for 15 minutes to ensure that the solution is saturated with calcium sulfate.
- 5) Let solution stand for 15 minutes to allow undissolved calcium sulfate to settle on the bottom of the container.
- 6) Decant into another container without transferring undissolved calcium sulfate.

(b) Conversion Coating Application

- 1) Wipe treatment area with dry clean cheesecloth to remove loose particles and residue.
- 2) Wipe with cheesecloth dampened (not saturated) with solvent, series 88. Repeat using clean cheesecloth until no visible residue transfers to the cheesecloth.
- 3) Allow to dry for a minimum of 15 minutes. Refer to para.2.C.(2)(c) for water break test to determine cleanliness.
- 4) Mask off dissimilar metal inserts, except chromium, nickel, corrosion resistant steel, or titanium.

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- 5) Apply solution by swabbing with brush, swab, swatches, cellulose sponge or white blotting paper. Maintain a continuous wet film until metal surface becomes dull golden to dark brown in color.
- 6) Rinse with clean cold water.
- 7) Allow to dry at ambient temperature. Force air dry if possible.
- 8) Apply original finish.
- 9) Remove masking and protective covering.

4. Surface Treatment for Carbon Steels

A. General.

- (1) Bare surfaces of carbon (alloy) steels are highly reactive when exposed to the environment. Carbon steel is either cadmium or cadmium titanium plated after machining and heat treatment. Steel parts absorb hydrogen during processing operations and in service when hydrogen may be produced and diffused into the metal. Hydrogen absorption, can cause crack initiation and propagation and result in delayed brittle fracture when the part is under sustained tensile strength. The susceptibility of steel parts to hydrogen embrittlement increases as hardness and strength increases.

B. Surface Treatment.

- (1) Steel parts heat-treated to 180 ksi and below are not considered susceptible to hydrogen embrittlement while steel parts heat-treated to 220 ksi and above are highly susceptible to hydrogen embrittlement and must be plated by Low embrittlement processes. In order to preclude the use of conventional plating process, reworked surfaces of all carbon steel parts shall be cadmium plated by low hydrogen embrittlement cadmium plating processes.

5. Surface Treatment for Stainless Steels and Nickel-Chromium Alloys

- A. No surface treatment is required after rework on stainless steel and nickelchromium alloys. Refer to par. 7 for plated alloys. Stainless steel requires passivation after rework.

6. Surface Treatment for Titanium Alloys

- A. No surface treatment is required after rework on titanium alloys. Apply original finish. Refer to par. 7 for plated alloys.

7. Surface Treatment for Cadmium Plated or Phosphated Metals

- A. Rework of cadmium plated surfaces indicates a break in the plated surface and exposure of the base metal. Surface treatment should therefore be replating of the base metal. Use low hydrogen embrittlement stylus cadmium plating. Major rework requires stripping and replating.
- B. Phosphate coating is applied to the cadmium plating on alloy steels heat treated to 180 ksi and above that are partially cadmium plated. Surface treatment involves use of phosphoric acid to the cadmium plating. If cadmium plating is broken, plate per par. A. before coating.

Alodine Solution Preparation for Immersion Method

Material	Variable	Make-Up ^{*[1]}		Control	
		Per 1 Gallon	Per 1 Liter	Per 1 Gallon	Per 1 Liter
Alodine 1000 Powder ^{*[2]}	Concentration	0.15 ounces	35.3 milligrams	0.14 to 0.18 ounces	32.8 to 42.4 milligrams
	pH	below 4.5 ^{*[3]}			
	Temperature	140°F (60°C) to 150°F (66°C)			

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(Continued)

Material	Variable	Make-Up ^{*[1]}		Control	
		Per 1 Gallon	Per 1 Liter	Per 1 Gallon	Per 1 Liter
Alodine 1000 Liquid ^{*[4]}	Concentration	19.20 fluid ounces as Alodine 1000L	33.8 milliliters as Alodine 1000L	17.9 to 23.0 fluid ounces as Alodine 1000L	31.4 to 40.6 milliliters as Alodine 1000L
		pH below 4.5 ^{*[3]}			
	Temperature 140°F (60°C) to 150°F (66°C)				
Alodine 1200	Concentration	1.2 ounces	35.3 milligrams	1.0 to 3.0 ounces	29.3 to 105.9 milligrams
		pH 1.5 to 2.1			
	Temperature 60°F (16°C) to 100°F (38°C)				
Alodine 1200S	Concentration	1.2 ounces	35.3 milligrams	1.0 to 3.0 ounces	29.3 to 105.9 milligrams
		pH 1.3 to 1.8 ^{*[5]}			
	Temperature 60°F (16°C) to 100°F (38°C)				
Alodine 1500	Concentration	1.28 fluid ounces	33.8 milliliters	1.10 to 1.46 fluid ounces	29.1 to 38.5 milliliters
		pH below 4.0 ^{*[3]}			
	Temperature 150°F (66°C) to 160°F (71°C)				

*[1] After make-up, allow the solution to set undisturbed for 24 hours before using. The small amount of precipitate which forms will not bother the coating process.

*[2] Where powder is used, allow solution to set undisturbed 24 hours before use. The small amount of precipitation which forms will not bother the coating process.

*[3] The pH may be lowered by additions of the Alodine until the top of the concentration range is reached. Discard the solution when the pH reaches the maximum value. Do not attempt control by adding acid.

*[4] Alodine 1000L is a liquid concentrate. One gallon of concentrate is equivalent to 1 ounce of Alodine 1000 powder.

*[5] Higher concentrations will tend to have lower pH values, which will rise with age or use, generally leveling off with the ranges stated. The pH may be lowered by additions of Alodine powder, nitric acid, or both. Where hard water is used, small additions of Alodine toner may be used.

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Alodine Solution Preparation for Manual Application

Material	Preparation Instructions
1000	Add 0.4 oz (11.3 g) of powder to water for each gallon of final solution. Stir well until the powder is dissolved. Disregard any small amount of settle-out insoluble material. Allow to stand at least one hour before use.
1000L	Dilute 4 volumes of the Alodine 1000L with 6 volumes of water and stir well to produce a final concentration of 0.4 ounce of Alodine 1000 per gallon of solution.
1200	Add 3 oz (85 g) of powder to water for each gallon of final solution. Stir well until the powder is dissolved. Disregard any small amount of settled-out insoluble material. Allow to stand at least one hour before use. A pH range of 1.50 to 1.90 is required and adjusted by addition of nitric acid.
1200S	Add 2 oz (57 g) of powder to water for each gallon of final solution. Stir well until the powder is dissolved. Disregard any small amount of settled-out insoluble material. Allow to stand at least one hour before use.
1500	Add 8 fl-oz (237 ml) of Alodine 1500 to water for each gallon of final solution. Stir to get a uniform mixture.

NOTE: When a water-break free surface cannot be obtained, Ridosol 501 wetting agent (same source as Alodine) may be added to the solution. Add 0.10 to 0.50% by volume, i.e. 0.128 to 0.64 fluid ounces per gallon.

Iridite Solution Preparation

Material	Variable	Make-Up ^{*[1]}	Control
Iridite 14	Concentration		2.7 to 3.3 oz/gal
	pH		1.0 to 1.7 ^{*[2]}
	Temperature		Room temp to 95°F (35°C)
Iridite 14-2	Concentration	1.45 oz/gal	1.25 to 2.25 oz/ gal
	pH		1.1 to 16 ^{*[2]}
	Temperature		Room temp to 95°F (35°C)

*[1] After make-up, allow the solution to set undisturbed for 24 hours before using. The small amount of precipitate which forms will not bother the coating process.

*[2] Adjust the pH with nitric acid until a distinctly yellow adherent film is obtained within the 5 minute immersion time on bare 2024 aluminum alloy.

8. Treatment of Fasteners and Fastener Holes in Composites for Repairs

- A. Graphite panel installed on graphite structural component.
 - (1) Remove fasteners, if loose.
 - (2) On countersinks and in holes, apply primer BMS 10-11 type 1 or BMS 10-79 type 2.
 - (3) Install removable steel or titanium fasteners dry.
 - (4) Install permanent fasteners with wet primer or BMS 5-95 sealant.
- B. Graphite panel installed on aluminum structure, or aluminum repair plates on graphite panels.
 - (1) Remove fasteners, if loose.
 - (2) On countersinks and in holes, apply primer BMS 10-11 type 1 or BMS 10-79 type 2.

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- (3) Apply BMS 5-95 fay surface sealant on mating surfaces.
 - (4) Install fasteners with wet BMS 5-95 sealant.
 - (5) 5) Fillet seal protruding fastener heads and nuts/washers.
- C. Armada or fiberglass or graphite panels, installed in any combination.
- (1) Remove fasteners, if loose.
 - (2) On countersinks and in holes, apply primer BMS 10-11 type 1 or BMS 10-79 type 2.
 - (3) Install removable fasteners with wet BMS 10-11 type 1 or BMS 10-79 type 2 primer.
 - (4) Install permanent fasteners with wet primer or BMS 5-95 sealant.

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STANDARD PREVENTIVE MAINTENANCE PRACTICES

1. General

- A. The data contained in this subject is general. For system and model specific preventive maintenance procedures, refer to Volume 2.

2. Airplane Washing

- A. Washing helps decrease corrosion as well as maintain the appearance of the airplane. Procedures for airplane washing are in Chapter 12 of the Maintenance Manual.
- B. Washing removes corrosive deposits that collect on airplane surfaces. Dirt collects moisture that then causes corrosion. But other factors are important in a washing program:
- (1) Washing and in particular high-pressure water or steam can get moisture into areas not usually contaminated.
 - (2) The detergents used for washing can cause corrosion if they are not fully rinsed off. Rinsing can be a problem if high-pressure hoses pushed the washing solution into small cavities.
 - (3) Any washing solution that removes unwanted grease and oil will also remove the grease and oil that must stay for lubrication. Lubrication again after airplane washing will then be necessary.
 - (4) Frequent washing will in time remove corrosion inhibiting compounds, such as BMS 3-23,3-26,3-29 or 3-35. The time is a function of the frequency of washing and the strength of the detergent.
 - (5) Too much polishing of unpainted aluminum surfaces can wear away the clad surfaces.
- C. The washing frequency must agree with the operating environment and external appearance of the airplane. As a guide these frequencies are recommended:
- (1) Mild Zones--90 days
 - (2) Moderate Zones--45 days
 - (3) Severe Zones--15 days
- D. Polishes can be used on unpainted surfaces but possibly only once every 18 months or 2 years.

3. Protective Finish

- A. Maintenance of the surface finish is important to prevent corrosion problems. Damage to paint or other surface coatings should be repaired at the earliest convenient opportunity. Until you can repair the finish, use a corrosion inhibitor to minimize the risk of corrosion.
- B. Where damage to the finish is not confined to the paint, and on surfaces without paint, treat the metal per PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING, PAGEBLOCK 51-21-21/701 before you apply the paint.
- C. Examples of finish systems are shown in Fig. 1. Refer to Chapter 51 of the Maintenance Manual for details of how to remove and apply finishes.

4. Corrosion Inhibitors

- A. Corrosion inhibitors are used with finish systems and to prevent or stop corrosion when the finish system is damaged. Many can get into small cavities to push out water. Thus, they can go in between faying surfaces or between fasteners and holes, where the finish is broken.

NOTE: Make an analysis of your airplane's environment, the inhibitor used, and the application schedule to be sure of sufficient corrosion protection. Other water displacing corrosion inhibiting compounds could be satisfactory. BMS 3-29 is being introduced into Boeing production lines as shown.

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- (1) For standardization, operators are encouraged to evaluate using BMS 3-29 as a replacement for both BMS 3-23 and the "dual coat" consisting of BMS 3- 23 and BMS 3-26. However, BMS 3-23 and BMS 3-26 are still acceptable. Also, refer to the discussion of a new heavy duty CIC BMS 3-35 (paragraph 4.E.).

B. BMS 3-23 Water Displacing Corrosion Inhibiting Compound

(1) General

- (a) This is an organic compound of nonvolatile base materials in solvents to make a fluid. It does not contain silicones. Dipping, brushing, or spraying can apply this compound. The liquid carrier evaporates quickly to put a thin layer of wax-like material on the surface. The coating is not easily rubbed or worn off, but must be applied again if the surface is washed frequently.
- (b) BMS 3-23 compound stays tacky and thus will collect unwanted material. The areas where it is applied must be regularly cleaned and then more of the corrosion inhibitor must be applied. The time between applications of the compound will change with the location in the airplane. Refer to the Maintenance Planning Document for details.2) Types of BMS 3-23 are listed below.
 - 1) Type I - A transparent colorless film which is detectable only with ultraviolet light.
 - 2) Type II - A colored film which is readily detected by the unaided eye.

(2) Materials qualified under BMS 3-23:

Type	Material	Vendor
I	Boeshield T-9 (colorless)	Gibson Chemicals, Ltd.,VZ0033
	Boeshield T-9HF (colorless)	Oxy Metal Industries, V45738
II	Boeshield T-9 (colored)	Gibson Chemicals, Ltd.,VZ0033
	Boeshield T-9HF colored)	Oxy Metal Industries, V45738
	LPS-3	Holt Lloyd Corp., V66724
	Dinitrol AV8 (Replaces AV5B-2)	Dinol International, VOL040

(3) Precautions for Use of BMS 3-23

- (a) As these are hydrocarbons, these compounds can be dangerous when mixed with oxygen. Oxygen system components must be shielded to protect them from direct or indirect contamination.
- (b) Precautions must be taken when using these materials which can constitute a fire hazard when subjected to high temperature.
- (c) Mask electrical connectors where there is a possibility of contamination of electrical contacts.
- (d) The use of corrosion inhibiting compounds on control cables is not considered a suitable substitute for the cleaning and corrosion protective procedures in the airplane maintenance manual. Direct application of these compounds on control cables, pulleys, teflon-lined bearings, and lubricated surfaces should be avoided.
- (e) Be careful when you apply corrosion-inhibiting compound near door or emergency hatch seals, grease seals in bearing assemblies or rubberlined clamps for tubing or wiring. Hydraulic seals may also be affected, so these corrosion inhibitors are not suitable for use on actuator rods.

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- (f) Do not apply corrosion inhibiting compounds on grease joints or sealed bearings. These compounds dissolve greases and other lubricants. They are penetrating compounds and can get around the seals and into the bearings.
 - (g) Do not apply or let corrosion inhibiting compounds get on insulation blankets. These compounds decrease the water-repellent quality and increase flammable quality of the blankets. If corrosion inhibiting compounds get on blankets, refer to INSULATION BLANKET - REMOVAL/INSTALLATION, PAGEBLOCK 25-80-00/401 for instructions.
 - (h) Do not apply these compounds on interior materials such as cargo liners. The compounds change the flammable quality of these materials.
 - (i) Do not apply these compounds near engines, cowling, or related areas of high temperature or where firewall sealant is used. The high temperature can cause deterioration of the compounds. Corrosion inhibiting compounds can cause damage to the sealant.
 - (j) Some corrosion inhibiting compounds dry tack-free and may cause increased friction or sluggish operation between moving parts. Do not spray these compounds on areas, such as exposed actuator rods, that will come in contact with other surfaces.
- (4) Compatibility of BMS 3-23
- (a) As these materials are all usually hydrocarbons, you can apply a different compound over existent corrosion inhibitors without bad effects.
 - (b) The compound can be used on fiberglass fairings and ducts if the temperature of the duct is not hotter than 220°F (104°C).
 - (c) The compound can be used on bladder fuel tanks and fuel vapor barriers.
- (5) Cleaning before application of BMS 3-23
- (a) The surface does not have to be extremely clear before you apply these compounds. But you will get better joint penetration if you clean the area first before application. Vacuum or wipe away loose dirt or other unwanted matter. Then you can clean the surfaces where necessary, with the usual airplane cleaning agents or solvents.
- (6) Application of BMS 3-23
- (a) Obey the precautions given in step (4) above and use masks or shields to give protection to components. Do not apply corrosion inhibiting compounds to areas which will subsequently be painted or sealed.
 - (b) Statically ground the airplane per NORMAL PARKING - MAINTENANCE PRACTICES, PAGEBLOCK 10-11-01/201.
 - (c) Before you apply corrosion inhibitor near batteries, electrical contacts, electrical connectors, or other components where there could be a fire hazard, remove external power and put the battery switch in the off position.
 - (d) Let all primers or enamels cure for a minimum of 8 hours.
 - (e) Apply a continuous wet coat to permit joint penetration by capillary action. An application rate by spraying of 1.000 gal (3.785 l) per hour at a coverage rate of 15.000 ft² (1.394 m²) to 20.000 ft² (1.858 m²) per minute will produce a film thickness of 0.0003 in. (0.0076 mm). Or these materials may be brushed. Refer to step (8) for details of spraying equipment and procedures. The use of pressure equipment that applies these compounds under pressure directly to a joint or lap will improve the penetration. A soak period of 60 minutes is required before excess compound is removed to ensure maximum penetration.
 - (f) Wipe up puddles with clean gauze or rags after the 60 minute minimum soak time.
 - (g) Give the area a good flow of air until the volatile solvents are gone. Then remove the masks or shields from the area treated.

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- (h) Do not use corrosion inhibiting compounds near oxygen system components. If you find corrosion near oxygen system components:
 - 1) Clean away corrosion products and repair per the Structural Repair Manual.
 - 2) Chemical treat all bare aluminum surfaces.
 - 3) Apply one coat BMS 10-11, type 1 green primer.
 - 4) Apply one coat BMS 10-11, type 1 yellow primer.
 - 5) Apply BMS 10-11, type 2 epoxy or BMS 10-60 polyurethane enamel.
- (7) Methods of Application of BMS 3-23
 - (a) Spray Application
 - 1) Aerosol cans can be used with plastic nozzle extensions but they are not generally recommended due to cost and the amount of overspray generated.
 - 2) The preferred application method is with standard pressure pot equipment using an airless spray gun operated at low pressure 45 psi (310 kPa). Suitable spray equipment is available from the following suppliers:
 - a) Nordson Corporation, V07036 or V2R369
 - b) The DeVilbiss Company, V17431
 - c) Binks Manufacturing Company, V07334
 - d) Graco Incorporated, V25980
 - 3) Greater accessibility will be provided with the use of accessories such as spray gun extension kits and swivel adapters for variable nozzle positioning.
 - 4) Standard air atomizing equipment (siphon or pressure pot) may be used when access is sufficient to allow application of a wet coat. A spray nozzle-to-surface distance of no more than 12 in. (30 cm) is required for wet application. When spray is operated with a pressure pot, a suitable extension may be made as follows:
 - a) Remove and retain air cap.
 - b) Remove fluid tip, and solder or braze 0.125 in. (3.175 mm) annealed copper tubing of desired length on end of tip.
 - c) Make nozzle at the end of the tubing by clamping tube around a 0.010 in. (0.254 mm) diameter wire.
 - d) Do not connect air hose to spray gun.
 - e) Use 25 ± 5 psi (172 ± 35 kPa) pot pressure for spraying.
 - (b) Brush Application
 - 1) Brush application may be accomplished using an ordinary paintbrush or a clean cloth. This method is most appropriate for small confined areas or where caution is necessary to prevent corrosion inhibiting compound from getting on surrounding equipment.
 - 2) For large areas or where confinement is not a problem, spray application is the effective method to use.
- (8) Removal of Water-Displacing Corrosion Inhibiting Compounds
 - (a) Complete removal of corrosion inhibiting compounds is required before repainting is attempted. Solvent cleaning is also required before penetrant inspection. The following solvents have been successfully used to remove these compounds:
 - 1) Perchloroethylene

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- 2) Trichloroethylene
- 3) Trichloroethane
- 4) Naphtha
- 5) Magnaflux Corp. solvent (V37636)
- 6) Dry cleaning solvent, P-D-680 (Not recommended for use in lower lobe cargo compartment)

NOTE: Use of methyl ethyl ketone (MEK) or acetone is not recommended.

- 7) Biogenic SE377C cleaner (V13092)(Preferred for removal of BMS 3-23 compound from areas with faying surfaces)
 - 8) Citra Safe (VOK209)
- (b) When you use solvents to remove water-displacing corrosion inhibiting compounds, give the area a good flow of air until the solvents evaporate.
- (9) Exterior Discoloration by BMS-23
- (a) Liberal use of water displacing corrosion inhibiting compounds on the internal surfaces of the airplane can lead to discoloration of the external surface. Because of the excellent penetrating properties of these materials, a bleed-through can be expected at fasteners that are not fluid-tight. This is normal and does not indicate a requirement to replace or redrive the fasteners. The tiny passages should seal themselves within a short time.
 - (b) You can remove these compounds from the exterior surface with one of the solvents listed. These solvents will not stain or damage the exterior of the airplane or decorative finish. A noticeable difference in oxidation of the exterior surfaces can occur between those areas, which have been coated with the compound, and areas that have not. If you see this difference in color, you can buff it out with the materials listed in Chapter 20 of the Maintenance Manual.

C. BMS 3-26 Corrosion Inhibiting Compound

- (1) General
 - (a) This is an organic compound of nonvolatile base materials in solvents to make a fluid. It does not contain silicones. This compound can be dipped, brushed, or sprayed. After it dries, it makes a transparent but visible protective layer.
 - (b) Coated surfaces become dry to the touch after 24 hours. The layer is not easily rubbed or worn off, but must be applied again if the surface is washed frequently.
- (2) Types of BMS 3-26
 - (a) Type I:
 - 1) Makes a continuous layer of medium thickness with a drop melting point of 140°F (60°C) minimum.
 - (b) Type II:
 - 1) Makes a continuous thick layer with a drop melting point of 200°F (93°C) minimum.
- (3) Materials qualified under BMS 3-26

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Type	Material	Vendor
I	Ardrox 3321	Ardrox Inc., V23373
	Dinitrol AV25B	Dinol International, VOL040
	Dinitrol AV25B-2	Dinol International, VOL040
	LPS Formula B997	Holt Lloyd Corp., V66724
II	Ardrox 3322	Ardrox Inc., V23373
	Dinitrol AV100D (Replaces AV100B)	Dinol International, VOL040
	LPS Formula B1007	Holt Lloyd Corp., V66724

- (4) Precautions for Use of BMS 3-26
 - (a) Use the same precautions for BMS 3-26 that we list for BMS 3-23 water displacing compound (Ref par. 4.B(3)).
- (5) Compatibility of BMS 3-26
 - (a) As these materials are usually hydrocarbons, you can apply a different compound over existent corrosion inhibitors without bad effects.
- (6) Cleaning before Application of BMS 3-26
 - (a) The surface does not need to be extremely clean before you apply these compounds. Vacuum or wipe away loose dirt or other unwanted matter. Then you can clean the surfaces, where necessary, with the usual airplane cleaning agents or solvents.
- (7) Methods of Application of BMS 3-26
 - (a) You can use the same application procedures for BMS 3-26 that we list for BMS 3-23 water displacing compound (Ref par. 4.B.(7),(8)), with the differences noted in steps (b) and (c) below.
 - (b) Let the BMS 3-26 compound dry. Do not wipe up puddles after 60 minutes.
 - (c) If the coated surface will touch another surface (such as insulation blankets), let the coating dry tack-free.
- (8) Removal BMS 3-26
 - (a) You can use the same solvents water displacing compound these solvents: for BMS 3-26 that we list for BMS 3-23 (Ref par. 4.B.(8)).
 - (b) You may use also:

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Use on BMS 3- 26 Type	Material	Vendor
I	Varsol No. 1	Exxon Company, USA, V29700
	Shell-Sol 345	Shell Petrochemical, V86961
	Skellysolve-S	Getty Oil Co., V8H761
	Chevron 325	Chevron USA, Inc., V4H372
	Union No. 5 Thinner	Union Oil Company of California, V79003 or V8F610
	S-76 Cleaning Solvent	Union Oil Company of California, V79003 or V8F610
	Klenzine	Atlantic Richfield Company, V1E874
	Sikkens 96.126	Sikkens, VH0951
II	Skellysolve V	Getty Oil Co., V8H761
	Standard 265 Thinner	Chevron USA, Inc., V4H372
	Sikkens 96.131	Sikkens, VH0951

(9) Exterior Discoloration by BMS 3-26

- (a) Liberal use of these corrosion-inhibiting compounds on the internal surface of the airplane can lead to discoloration of the external surface. Because of the excellent penetrant properties of these materials, a "bleed through" can be expected at fasteners that are not fluid-tight. This is normal and does not indicate a requirement to replace or redrive the fasteners. The tiny passages should seal themselves within a short time.
- (b) You can remove these compounds from the exterior surface with one of the solvents listed. These solvents will not stain or damage the exterior of the airplane or decorative finish. But a noticeable difference in oxidation of the exterior surfaces can occur between those areas, which have been coated with the compound, and areas that have not. If you see this difference in color, you can buff it out with the materials listed in Chapter 20 of the Maintenance Manual.

D. BMS 3-29 Corrosion Inhibiting Compound

(1) General

- (a) This is an organic compound of nonvolatile base materials in solvents to make a fluid. It does not contain silicones. This compound can be dipped, brushed or sprayed. After it dries, it makes a transparent but visible protective layer. Coated surfaces become dry to the touch after 24 hours. The layer is not easily rubbed or worn off, but must be applied again if the surface is washed frequently.

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- (b) BMS 3-29 specifies an advanced corrosion-inhibiting compound that has the penetration characteristics of BMS 3-23 and the durability of BMS 3-26. BMS 3-29 may be used in lieu of a single coat of BMS 3- 23 or the two-coat system (dualcoat) of BMS 3-23 and BMS 3-26.

NOTE: Dinol AV-30 (BMS 3-29) weighs over 3 times as much as Dinol AV-8 (BMS 3-23) and could produce a significant weight increase when used on all areas where a single coat of corrosion inhibiting compound is recommended. This is based on the dry film weights of AV- 30 compared to AV-8 when applied at the recommended thickness. Once the coating has cured, a weight increase of approximately 1.10 lb (500.00 g) per 0.264 gal (1.000 l) of AV-30 used or 0.18 lb (80.00 g) per 10.76 ft² (1.00 m²) of surface area covered will be realized. The weight increase from AV-8 is approximately 0.73 lb (330.00 g) per 0.264 gal (1.000 l) and 0.06 lb (25.00 g) per 10.76 ft² (1.00 m²). A decrease in coating weight of approximately 40% would be realized if AV-30 is used in lieu of the BMS 3-23/ BMS 3-26 dualcoat (0.31 lb (140.00 g) per 10.76 ft² (1.00 m²)). All weights are approximations and will vary depending on actual dry film thickness.

(2) Materials qualified under BMS 3-29

Table with 2 columns: Material, Vendor. Row 1: Dinitrol AV-30, Dinol International., VOL040

(3) Precautions for Use of BMS 3-29

- (a) Use the same precautions for BMS 3-29 that we list for BMS 3-23 water displacing compound (Ref par. 4.B.(3)).

(4) Compatibility of BMS 3-29

- (a) As these materials are usually hydrocarbons, you can apply a different compound over existent corrosion inhibitors without bad effects.

(5) Cleaning before application of BMS 3-29

- (a) The surface does not need to be extremely clean before you apply these compounds. But you will get better joint penetration if you clean the area first. Vacuum or wipe away loose dirt or other unwanted matter. Then you can clean the surfaces, where necessary, with usual airplane cleaning agents or solvents.

(6) Methods of Application of BMS 3-29

- (a) You can use the same application procedures for BMS 3-29 that we list for BMS 3-23 water displacing compound (Ref par. 4.B.(7),(8)), with the differences noted in steps (b) and (c) below.
(b) Let the BMS 3-29 compound dry. Do not wipe up puddles after 60 minutes.
(c) If the coated surface will touch another surface (such as insulation blankets), let the coating dry tack-free.

(7) Removal of BMS 3-29

- (a) You can use the same solvents for BMS 3-29 that we list for BMS 3-23 water displacing compound (Ref par. 4.B.(8)). Also, use these solvents:

Table with 2 columns: Material, Vendor. Rows: Varsol No. 1, Exxon Company, USA, V29700; Shell-Sol 345, Shell Petrochemical, V86961; Skellysolve-S, Getty Oil Co., V8H761

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Material	Vendor
Chevron 325	Chevron USA, Inc., V4H372
Union No. 5 Thinner	Union Oil Company of California, V79003 or V8F610
S-76 Cleaning Solvent	Union Oil Company of California, V79003 or V8F610
Klenzine	Atlantic Richfield Company, V1E874
Sikkens 96.126	Sikkens, VH0951
Skellysolve V	Getty Oil Co., V8H761
Standard 265 Thinner	Chevron USA, Inc., V4H372
Sikkens 96.131	Sikkens, VH0951

(8) Exterior Discoloration by BMS 3-29

- (a) Liberal use of these corrosion-inhibiting compounds on the internal surface of the airplane can lead to discoloration of the external surface. Because of the excellent penetrant properties of these materials, a "bleed through" can be expected at fasteners that are not fluid-tight. This is normal and does not indicate a requirement to replace or redrive the fasteners.
- (b) You can remove these compounds from the exterior surface with one of the solvents listed. These solvents will not stain or damage the exterior of the airplane or decorative finish. But a noticeable difference in oxidation of the exterior surfaces can occur between those areas which have been coated with the compound and areas that have not.

E. BMS 3-35 Corrosion Inhibiting Compound

(1) General

- (a) A new heavy duty CIC, BMS 3-35 has been developed. Although BMS 3-35 provides crevice penetration close to that achieved with BMS 3-23, it meets the same 1500 hour salt spray corrosion protection requirement as BMS 3-29. BMS 3-35 is approved for use on all Boeing commercial model airplanes including those no longer in production.

(2) Materials qualified under BMS 3-35

Material	Vendor
Cor-Ban 3-35	Zip-Chem Products., V8E913
Dinitrol AV-15	Dinol International., VOL04

(3) Precautions or use of BMS 3-35.

- (a) Use the same precautions of BMS 3-35 as we list for BMS 3-23 (Ref par. 4.B.(3)).

(4) Compatibility of BMS 3-35

- (a) BMS 3-35 are compatible with all Boeing approved CIC's.

(5) Cleaning before application of BMS 3-35

- (a) The surface does not need to be extremely clean before you apply BMS 3-35 but better joint penetration will be obtained if you clean the area first.

(6) Methods of Application of BMS 3-35

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- (a) The application hardware and processes for BMS 3-35 are the same as applying other heavy duty CIC products. Refer to CORROSION INHIBITING COMPOUND - CLEANING/PAINTING, PAGEBLOCK 51-21-91/701 for additional CIC application details.
- F. MIL-C-16173 Corrosion Preventive Compound
- (1) Although the water-displacing corrosion inhibiting compounds are the primary corrosion inhibitors used in airplane manufacture, in certain applications where a more durable surface protection is required, solvent- dispersed corrosion inhibiting compounds per MIL-C-16173, Grade 1 are used. These materials are volatile liquids which may be sprayed or brushed on the surfaces to be treated. The liquid carrier evaporates and leaves a residue (hard grease in appearance) which will become sufficiently dry to permit handling after approximately 4 hours. The Grade 1 compound provides a hard film, but does not have the penetrating or water displacing qualities of the BMS 3-23 or similar corrosion inhibiting compounds. Applications should be limited to areas where a specific callout of this inhibitor is made.
- (2) Types of MIL-C-16173
- (a) Grade 1 compounds form a hard film like a hard grease. This coating is dry enough to touch in 4 hours. But it does not penetrate crevices or displace water.
- (b) Grade 2 compounds form a film which stays soft after it dries. This coating does not displace water.
- (c) Grade 3 compounds form a film which stays soft after it dries. This compound will displace water.
- (d) Grade 4 compounds form a transparent film. This coating is dry enough to touch in 4 hours, and is non-tacky after 24 hours.
- (e) Grade 5 compounds form a film which stays soft after it dries. The coating can be removed with low pressure steam. This compound will displace water.
- (3) Grade 1 is the most common type of MIL-C-16173 compound used for corrosion prevention. Cosmoline 1058 (V73277), referred to as Cosmoline in this manual, is the MIL-C-16173 Grade 1 material that we use in production. Refer to the Qualified Products List of MIL-C-16173 for a complete listing of approved material part numbers and vendors, for all grades.
- (4) Precautions for Use of MIL-C-16173
- (a) Use the same precautions for MIL-C-16173 that we list for water displacing corrosion inhibiting compounds (Ref par. 4.B.(3)).
- (5) Compatability of MIL-C-16173
- (a) As these materials are all usually hydrocarbons, you can apply new applications of a different compound over existing corrosion inhibitors without bad effects.
- (6) Cleaning Before Application of MIL-C-16173
- (a) The surface does not need to be extremely clean before you apply these compounds. But you will get a better continuous film if you clean the area first. Vacuum or wipe away loose dirt or other unwanted matter. Then you can clean the surfaces, where necessary, with the usual airplane cleaning agents or solvents.
- (7) Application of MIL-C-16173
- (a) You can use the same application procedures for MIL-C-16173 that we list for BMS 3-23 water displacing compound (Ref par. 4.B.(7), (8)), with the differences noted in steps (b)(c) below.
- (b) Let the MIL-C-16173 compound dry. Do not wipe up puddles after 60 minutes.

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- (c) If the coated surface will touch another surface (such as insulation blankets), let the coating dry tack-free. (Use only grades 1, 4, or 5. Grades 2 and 3 form soft films which would be damaged by such contact.)
- (8) Removal of MIL-C-16173
 - (a) You need to remove all of the compound before you try to paint the surface. Solvent cleaning is also required before penetrant inspection.
 - (b) Naptha can remove these compounds. Methyl Ethyl Ketone (MEK) or acetone is not recommended.
 - (c) When you use solvents to remove corrosion inhibitors, give the area a good flow of air until the solvents evaporate.
- G. MIL-C-11796 Corrosion-Preventive compound
 - (1) This is a petrolatum-base compound, which is applied as a hot liquid. The compound can be applied with a brush or a swab. Small parts can be dipped in the liquid. The internal surfaces of tubes or other hollow parts can be coated by a fill and drain method.
 - (2) Types of MIL-C-11796
 - (a) Grade 1 compounds form a hard film. They can penetrate 0.125 in. (3.175 mm) to 0.312 in. (7.925 mm) and have a melting point of 155°F (68°C) or higher.
 - (b) Grade 1A compounds are similar to Class 1 compounds, but will not cause an oil slick on water.
 - (c) Class 2 compounds form a medium film, and can penetrate 0.354 in. (9.000 mm) to 0.591 in. (15.000 mm) and have a melting point of 150°F (66°C).
 - (d) Class 3 compounds form a soft film that can be applied and easily removed at room temperature. They can penetrate 0.9 ± 0.1 in. (22.5 ± 2.5 mm) and have a melting point of 135°F (57°C). These compounds can mix with lubricating oil.
 - (3) Refer to the Qualified Products List of MIL-C-11796 for a complete listing of approved material part numbers and vendors for all grades.
 - (4) Precautions for Use MIL-C-11796
 - (a) Use the same precautions for MIL-C-11796 that we list for waterdisplacing corrosion inhibiting compounds (Ref par. 4.B.(3)).
 - (5) Compatibility of MIL-C-11796
 - (a) As these materials are all usually hydrocarbons, you can apply new applications of a different compound over existent corrosion inhibitors without bad effects.
 - (6) Compatibility of MIL-C-11796
 - (a) The surface does not need to be extremely clean before you apply these compounds. But you will get better continuous film if you clean the area first. Vacuum or wipe away loose dirt or other unwanted matter. Then you can clean the surfaces, where necessary, with the usual airplane cleaning agents or solvents.
 - (7) Application of MIL-C-11796
 - (a) These compounds are applied as hot liquids. During application, keep the compounds in the following temperature ranges:

Application Temperatures	
MIL-C-11796	Temperature
Class 1 or 1A	170°F (77°C) to 200°F (93°C)

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Application Temperatures	
MIL-C-11796	Temperature
Class 2	160°F (71°C) to 190°F (88°C)
Class 3	150°F (66°C) to 180°F (82°C)

- (b) Apply the compound to the surface with a brush or swab.
 - (c) To apply the compound to the internal surfaces of hollow parts, refer to CORROSION INHIBITING COMPOUND - CLEANING/PAINTING, PAGEBLOCK 51-21-91/701.
- (8) Removal of MIL-C-11796
- (a) You need to remove the entire compound before you try to paint the surface. Solvent cleaning is also required before penetrant inspection.
 - (b) Dry cleaning solvent P-D-680 can remove these compounds. Methyl Ethyl Ketone (MEK) or acetone is not recommended.
 - (c) When you use solvents to remove the compound, give the area a good flow of air until the solvents evaporate.

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TRANSPORTATION OF LIVE ANIMALS - MAINTENANCE PRACTICES

1. General

- A. Problems associated with the occasional transportation of small animals in cargo compartment are negligible, but the bulk transportation of large animals makes it advisable to ensure that adequate precautionary measures against corrosion are taken. Corrosion problems arising from the transportation of live animals occur from two main sources. One is derived from animal wastes which are corrosive. Because the effects of waste products are so well known, adequate steps are usually taken to ensure that the airplane does not become contaminated. The second problem source is the increase in humidity inside the airplane.
B. Animal Wastes
(1) It is the usual practice to dehydrate animals before transportation to minimize the amount of waste products generated.
(2) The bulk transportation of animals necessitates the use of absorbent floor coverings to contain the waste. Solids are removed after every flight and replaced with clean wood shavings. After two-round trips the floor covering is replaced.
C. Humidity
(1) Animals generate more heat than humans consequently there is a greater possibility of moisture buildup in the airplane.
(2) To permit the maximum possible circulation of air from the cabin air conditioning system the use of pens with open areas in the sidewalls is recommended.
(3) To reduce the effect of high ground temperatures it is recommended that fans be used to circulate air through the cabin while the airplane is on the ground.

TASK 51-00-60-200-801

2. Preventive Maintenance

A. General

- (1) The use of airplanes for bulk shipment of live animals necessitates periodic cleaning and deodorizing of the airplane. As this requires removal of cabin lining and insulation blankets it also provides an excellent opportunity to perform preventive maintenance.

B. References

Table with 2 columns: Reference and Title. Rows include: 25-52-00-100-801 Cargo Compartment Cleaning (P/B 701); 25-80-00 INSULATION BLANKET; 51-05-01 P/B 201 STRUCTURES - CORROSION INSPECTIONS - MAINTENANCE PRACTICES; 51-21-31 P/B 701 CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING; 51-21-91-620-802 Application of Corrosion Inhibiting Compound (P/B 701); 51-41 AIRFRAME DRAINAGE

C. Procedure

SUBTASK 51-00-60-100-001

- (1) When known animal waste spills have occurred, do this task: Cargo Compartment Cleaning, TASK 25-52-00-100-801.

NOTE: Avoid spreading the spilled fluids through floor clearances.

SUBTASK 51-00-60-160-001

- (2) At each available opportunity inspect:

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- (a) The inner skin surface and fuselage structure for signs of corrosion, refer to STRUCTURES - CORROSION INSPECTIONS - MAINTENANCE PRACTICES, PAGEBLOCK 51-05-01/201 and CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING, PAGEBLOCK 51-21-31/701 for more details.
- (b) Make sure that all drains are unobstructed and that there are no trapped liquids (AIRFRAME DRAINAGE, SECTION 51-41).
- (c) Condition of insulation blankets (INSULATION BLANKET, SUBJECT 25-80-00).
 - 1) Replace soaked insulation blankets.

SUBTASK 51-00-60-600-001

(3) After the airplane has been cleaned and deodorized do these steps:

- (a) Apply corrosion inhibiting compound to the inner skin surface and structure (Application of Corrosion Inhibiting Compound, TASK 51-21-91-620-802) as necessary.

NOTE: In the fuselage crown area, airplanes used for livestock transportation will require and receive more frequent preventive maintenance than recommended in Volume 2.

- (b) Install the equipment that you removed.

————— **END OF TASK** —————

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MICROBIAL GROWTH IN INTEGRAL FUEL TANKS - MAINTENANCE PRACTICES

1. General

- A. Corrosion of integral fuel tanks has been encountered due to microbial growth. Microorganisms enter the tank with the fuel. Airplane fuel tanks also frequently contain some water which either enters the tank with the fuel or is the result of condensation within the tank. The microbes thrive at the water/fuel interface and multiply rapidly forming a slime or matted growth within the tank. This matted growth traps water so that it cannot be removed by normal slumping procedures. Corrosion is produced when the protective finishes on the lower surfaces of the fuel tank eventually break down under continuous exposure to water soaked microbial growth mats and the by-products of microbial growth.
- (1) Refer to STORAGE - MAINTENANCE PRACTICES, PAGEBLOCK 28-10-00/201 for detection of microbial contamination and treatment procedures.

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TRANSPORTATION OF FISH - MAINTENANCE PRACTICES

1. General

- A. This information is about the corrosion problems arising from the transportation of fish that occur from spillage from the containers.
- B. This procedure has these tasks:

TASK 51-00-62-200-801

2. Preventive Maintenance

A. General

- (1) The use of airplanes for shipment of fish requires periodic cleaning and deodorizing of the airplane using locally available supplies. As this requires removal of cabin lining and insulation blankets it also provides an excellent opportunity to perform corrosion preventive maintenance.

B. References

Reference	Title
25-52-00-100-801	Cargo Compartment Cleaning (P/B 701)
25-80-00	INSULATION BLANKET
51-05-01 P/B 201	STRUCTURES - CORROSION INSPECTIONS - MAINTENANCE PRACTICES
51-21-31 P/B 701	CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING
51-21-91-620-802	Application of Corrosion Inhibiting Compound (P/B 701)
51-41	AIRFRAME DRAINAGE
53-42-11-100-801	Clean the Passenger Cabin and Cargo Compartment Track (P/B 701)

C. Procedure

SUBTASK 51-00-62-100-002

- (1) When known spills have occurred, do this task: Cargo Compartment Cleaning, TASK 25-52-00-100-801.

NOTE: Avoid spreading the spilled fluids through floor clearances.

SUBTASK 51-00-62-100-001

- (2) Do this task to clean spills on seat tracks: Clean the Passenger Cabin and Cargo Compartment Track, TASK 53-42-11-100-801.

SUBTASK 51-00-62-160-001

- (3) At each available opportunity inspect:
 - (a) The inner skin surface and fuselage structure for signs of corrosion, refer to STRUCTURES - CORROSION INSPECTIONS - MAINTENANCE PRACTICES, PAGEBLOCK 51-05-01/201 and CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING, PAGEBLOCK 51-21-31/701 for more details.
 - (b) Make sure that all drains are unobstructed and that there are no trapped liquids (AIRFRAME DRAINAGE, SECTION 51-41).
 - (c) Condition of insulation blankets (INSULATION BLANKET, SUBJECT 25-80-00).
 - 1) Replace soaked insulation blankets.

SUBTASK 51-00-62-600-001

- (4) After the airplane has been cleaned and deodorized do these steps:
 - (a) Apply corrosion inhibiting compound to the inner skin surface and structure (Application of Corrosion Inhibiting Compound, TASK 51-21-91-620-802) as necessary.

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- (b) Install the equipment that you removed.

————— **END OF TASK** —————

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STRUCTURES - CORROSION INSPECTIONS - MAINTENANCE PRACTICES

1. General

A. This procedure contains MSG-3 task card data

TASK 51-05-01-210-801

2. 737-678 Basic Task Description

A. CPCP Basic Task

SUBTASK 51-05-01-210-022

(1) CPCP Basic Task Item 1 is not applicable.

SUBTASK 51-05-01-210-023

(2) Do the CPCP Basic Task Item 2 as follows:

- (a) Prior to inspection clean the area as required to accomplish CPCP Basic Task Item 3. It is not necessary to remove normal amounts of sealant/leveling compound unless it has deteriorated to the point where moisture can penetrate down to the metal. A light uniform film of Corrosion Inhibiting Compound (CIC) that has not accumulated dirt or debris, will normally allow adequate inspection of the structure without removal. CIC may require removal if there are multiple layers and/or accumulations of dirt or debris.

SUBTASK 51-05-01-210-024

(3) Do the CPCP Basic Task Item 3 as follows:

- (a) Visually inspect all structure listed in the task description. The inspection method is as specified in each task description. Use Additional non-destructive inspections or visual inspections following partial disassembly if there are indications of hidden corrosion, such as bulging skins or corrosion running into splices, or under fittings, etc. In the task area, check the integrity of any sealant/leveling compound to determine if removal is required, and any corrosion inhibiting compound, particularly at faying surfaces, to determine if additional application is required per CPCP Basic Task Item 6.

SUBTASK 51-05-01-210-025

(4) Do the CPCP Basic Task item 4 as follows:

- (a) Remove all corrosion, evaluate damage and repair or replace all discrepant structure as required, including application of protective finishes per Boeing Corrosion Prevention Manual (CPM) D6-82560 Section 20-50-00, or 737 Structural Repair Manual (SRM) D634A200, (-600), D634A201 (-700), D634A210 (-800), D634A211(-900), D634A333 (BBJ), or related service bulletin, as appropriate. Surface oxidation of ferrous metal fasteners may be handled by normal or existing maintenance practices.

SUBTASK 51-05-01-210-026

(5) CPCP Basic Task Item 5 is not applicable.

SUBTASK 51-05-01-210-027

(6) Do the CPCP Basic Task item 6 as follows:

- (a) Apply suitable approved water displacing / anti-corrosion compound as necessary.
- 1) The minimum requirement for all areas (except as noted in CPCP Basic Task 6 (1) (a) 3)) is single coat of water displacing / anti-corrosion compound that penetrates faying surfaces and displaces moisture, e.g. a single coat of BMS 3-29 or BMS 3-23, where the initial or previous coat has been disturbed or removed.
 - 2) Not applicable
 - 3) List of areas / items where water displacing/anti-corrosion compounds should not be applied:

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Water displacing / anti-corrosion compounds should not be applied in the following areas:

- Cables, pulleys, wiring, plastics, elastomers, oxygen systems.
- Lubricated or Teflon surfaces (E.g. greased joints, sealed bearings).
- Over Cosmoline 1058 (or Equivalent per MIL-C-16173 Grade 1).
- Adjacent to tears / holes in insulation blankets (water repelling characteristics are diminished).
- Areas with electrical arc potential.
- Interior materials, including cargo liners (change of flammability properties).
- Fiber-glass ducts where temperature exceeds 220 degrees F.
- Selected areas noted in baseline program.

SUBTASK 51-05-01-210-028

- (7) CPCP Basic Task Item 7 is not applicable.

————— **END OF TASK** —————

TASK 51-05-01-210-802

3. 737-678 Basic Task Description

A. CPCP Basic Task

SUBTASK 51-05-01-210-029

- (1) Do the CPCP Basic Task Item 1 as follows:

- (a) Remove all systems, equipment and interior furnishings, etc. (e.g. toilets, galleys, linings, installation) as necessary to accomplish CPCP Basic Task Item 3. It is not necessary to remove bushings unless specified in the Task Description, or if there is an indication of corrosion, or that the bushing has migrated.

SUBTASK 51-05-01-210-030

- (2) Do the CPCP Basic Task Item 2 as follows:

- (a) Prior to inspection clean the area as required to accomplish CPCP Basic Task Item 3. It is not necessary to remove normal amounts of sealant/leveling compound unless it has deteriorated to the point where moisture can penetrate down to the metal. A light uniform film of Corrosion Inhibiting Compound (CIC) that has not accumulated dirt or debris, will normally allow adequate inspection of the structure without removal. CIC may require removal if there are multiple layers and/or accumulations of dirt or debris.

SUBTASK 51-05-01-210-031

- (3) Do the CPCP Basic Task Item 3 as follows:

- (a) Visually inspect all structure listed in the task description. The inspection method is as specified in each task description. Use Additional non-destructive inspections or visual inspections following partial disassembly if there are indications of hidden corrosion, such as bulging skins or corrosion running into splices, or under fittings, etc. In the task area, check the integrity of any sealant/leveling compound to determine if removal is required, and any corrosion inhibiting compound, particularly at faying surfaces, to determine if additional application is required per CPCP Basic Task Item 6.

SUBTASK 51-05-01-210-032

- (4) Do the CPCP Basic Task item 4 as follows:

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- (a) Remove all corrosion, evaluate damage and repair or replace all discrepant structure as required, including application of protective finishes per Boeing Corrosion Prevention Manual (CPM) D6-82560 Section 20-50-00, or 737 Structural Repair Manual (SRM) D634A200, (-600), D634A201 (-700), D634A210 (-800), D634A211(-900), D634A333 (BBJ), or related service bulletin, as appropriate. Surface oxidation of ferrous metal fasteners may be handled by normal or existing maintenance practices.

SUBTASK 51-05-01-210-033

- (5) CPCP Basic Task Item 5 is not applicable.

SUBTASK 51-05-01-210-034

- (6) Do the CPCP Basic Task item 6 as follows:

- (a) Apply suitable approved water displacing / anti-corrosion compound as necessary.

- 1) The minimum requirement for all areas (except as noted in CPCP Basic Task 6 (1) (a) 3)) is single coat of water displacing / anti-corrosion compound that penetrates faying surfaces and displaces moisture, e.g. a single coat of BMS 3-29 or BMS 3-23, where the initial or previous coat has been disturbed or removed.

- 2) Not applicable

- 3) List of areas / items where water displacing/anti-corrosion compounds should not be applied:

Water displacing / anti-corrosion compounds should not be applied in the following areas:

- Cables, pulleys, wiring, plastics, elastomers, oxygen systems.
- Lubricated or Teflon surfaces (E.g. greased joints, sealed bearings).
- Over Cosmoline 1058 (or Equivalent per MIL-C-16173 Grade 1).
- Adjacent to tears / holes in insulation blankets (water repelling characteristics are diminished).
- Areas with electrical arc potential.
- Interior materials, including cargo liners (change of flammability properties).
- Fiber-glass ducts where temperature exceeds 220 degrees F.
- Selected areas noted in baseline program.

SUBTASK 51-05-01-210-035

- (7) CPCP Basic Task Item 7 is not applicable.

————— **END OF TASK** —————

TASK 51-05-01-210-803

4. 737-678 Basic Task Description

A. CPCP Basic Task

SUBTASK 51-05-01-210-036

- (1) Do the CPCP Basic Task Item 1 as follows:

- (a) Remove all systems, equipment and interior furnishings, etc. (e.g. toilets, galleys, linings, installation) as necessary to accomplish CPCP Basic Task Item 3. It is not necessary to remove bushings unless specified in the Task Description, or if there is an indication of corrosion, or that the bushing has migrated.

SUBTASK 51-05-01-210-037

- (2) Do the CPCP Basic Task Item 2 as follows:

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- (a) Prior to inspection clean the area as required to accomplish CPCP Basic Task Item 3. It is not necessary to remove normal amounts of sealant/leveling compound unless it has deteriorated to the point where moisture can penetrate down to the metal. A light uniform film of Corrosion Inhibiting Compound (CIC) that has not accumulated dirt or debris, will normally allow adequate inspection of the structure without removal. CIC may require removal if there are multiple layers and/or accumulations of dirt or debris.

SUBTASK 51-05-01-210-038

- (3) Do the CPCP Basic Task Item 3 as follows:

- (a) Visually inspect all structure listed in the task description. The inspection method is as specified in each task description. Use Additional non-destructive inspections or visual inspections following partial disassembly if there are indications of hidden corrosion, such as bulging skins or corrosion running into splices, or under fittings, etc. In the task area, check the integrity of any sealant/leveling compound to determine if removal is required, and any corrosion inhibiting compound, particularly at faying surfaces, to determine if additional application is required per CPCP Basic Task Item 6.

SUBTASK 51-05-01-210-039

- (4) Do the CPCP Basic Task item 4 as follows:

- (a) Remove all corrosion, evaluate damage and repair or replace all discrepant structure as required, including application of protective finishes per Boeing Corrosion Prevention Manual (CPM) D6-82560 Section 20-50-00, or 737 Structural Repair Manual (SRM) D634A200, (-600), D634A201 (-700), D634A210 (-800), D634A211(-900), D634A333 (BBJ), or related service bulletin, as appropriate. Surface oxidation of ferrous metal fasteners may be handled by normal or existing maintenance practices.

SUBTASK 51-05-01-210-040

- (5) CPCP Basic Task Item 5 is not applicable.

SUBTASK 51-05-01-210-041

- (6) CPCP Basic Task Item 6 is not applicable.

SUBTASK 51-05-01-210-042

- (7) CPCP Basic Task Item 7 is not applicable.

————— **END OF TASK** —————

TASK 51-05-01-210-804

5. 737-678 Basic Task Description

A. CPCP Basic Task

SUBTASK 51-05-01-210-043

- (1) Do the CPCP Basic Task Item 1 as follows:

- (a) Remove all systems, equipment and interior furnishings, etc. (e.g. toilets, galleys, linings, installation) as necessary to accomplish CPCP Basic Task Item 3. It is not necessary to remove bushings unless specified in the Task Description, or if there is an indication of corrosion, or that the bushing has migrated.

SUBTASK 51-05-01-210-044

- (2) Do the CPCP Basic Task Item 2 as follows:

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- (a) Prior to inspection clean the area as required to accomplish CPCP Basic Task Item 3. It is not necessary to remove normal amounts of sealant/leveling compound unless it has deteriorated to the point where moisture can penetrate down to the metal. A light uniform film of Corrosion Inhibiting Compound (CIC) that has not accumulated dirt or debris, will normally allow adequate inspection of the structure without removal. CIC may require removal if there are multiple layers and/or accumulations of dirt or debris.

SUBTASK 51-05-01-210-045

- (3) Do the CPCP Basic Task Item 3 as follows:

- (a) Visually inspect all structure listed in the task description. The inspection method is as specified in each task description. Use Additional non-destructive inspections or visual inspections following partial disassembly if there are indications of hidden corrosion, such as bulging skins or corrosion running into splices, or under fittings, etc. In the task area, check the integrity of any sealant/leveling compound to determine if removal is required, and any corrosion inhibiting compound, particularly at faying surfaces, to determine if additional application is required per CPCP Basic Task Item 6.

SUBTASK 51-05-01-210-046

- (4) Do the CPCP Basic Task item 4 as follows:

- (a) Remove all corrosion, evaluate damage and repair or replace all discrepant structure as required, including application of protective finishes per Boeing Corrosion Prevention Manual (CPM) D6-82560 Section 20-50-00, or 737 Structural Repair Manual (SRM) D634A200, (-600), D634A201 (-700), D634A210 (-800), D634A211(-900), D634A333 (BBJ), or related service bulletin, as appropriate. Surface oxidation of ferrous metal fasteners may be handled by normal or existing maintenance practices.

SUBTASK 51-05-01-210-047

- (5) Do the CPCP Basic Task Item 5 as follows:

- (a) Clear any blocked holes or gaps that may hinder drainage, as applicable.

SUBTASK 51-05-01-210-048

- (6) Do the CPCP Basic Task item 6 as follows:

- (a) Apply suitable approved water displacing / anti-corrosion compound as necessary.
- 1) The minimum requirement for all areas (except as noted in CPCP Basic Task 6 (1) (a) 3)) is single coat of water displacing / anti-corrosion compound that penetrates faying surfaces and displaces moisture, e.g. a single coat of BMS 3-29 or BMS 3-23, where the initial or previous coat has been disturbed or removed.
 - 2) Not applicable
 - 3) List of areas / items where water displacing/anti-corrosion compounds should not be applied:
Water displacing / anti-corrosion compounds should not be applied in the following areas:
 - Cables, pulleys, wiring, plastics, elastomers, oxygen systems.
 - Lubricated or Teflon surfaces (E.g. greased joints, sealed bearings).
 - Over Cosmoline 1058 (or Equivalent per MIL-C-16173 Grade 1).
 - Adjacent to tears / holes in insulation blankets (water repelling characteristics are diminished).
 - Areas with electrical arc potential.
 - Interior materials, including cargo liners (change of flammability properties).
 - Fiber-glass ducts where temperature exceeds 220 degrees F.

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- Selected areas noted in baseline program.

SUBTASK 51-05-01-210-049

- (7) CPCP Basic Task Item 7 is not applicable.

————— **END OF TASK** —————

TASK 51-05-01-210-805

6. 737-678 Basic Task Description

A. CPCP Basic Task

SUBTASK 51-05-01-210-050

- (1) Do the CPCP Basic Task Item 1 as follows:

- (a) Remove all systems, equipment and interior furnishings, etc. (e.g. toilets, galleys, linings, installation) as necessary to accomplish CPCP Basic Task Item 3. It is not necessary to remove bushings unless specified in the Task Description, or if there is an indication of corrosion, or that the bushing has migrated.

SUBTASK 51-05-01-210-051

- (2) Do the CPCP Basic Task Item 2 as follows:

- (a) Prior to inspection clean the area as required to accomplish CPCP Basic Task Item 3. It is not necessary to remove normal amounts of sealant/leveling compound unless it has deteriorated to the point where moisture can penetrate down to the metal. A light uniform film of Corrosion Inhibiting Compound (CIC) that has not accumulated dirt or debris, will normally allow adequate inspection of the structure without removal. CIC may require removal if there are multiple layers and/or accumulations of dirt or debris.

SUBTASK 51-05-01-210-052

- (3) Do the CPCP Basic Task Item 3 as follows:

- (a) Visually inspect all structure listed in the task description. The inspection method is as specified in each task description. Use Additional non-destructive inspections or visual inspections following partial disassembly if there are indications of hidden corrosion, such as bulging skins or corrosion running into splices, or under fittings, etc. In the task area, check the integrity of any sealant/leveling compound to determine if removal is required, and any corrosion inhibiting compound, particularly at faying surfaces, to determine if additional application is required per CPCP Basic Task Item 6.

SUBTASK 51-05-01-210-053

- (4) Do the CPCP Basic Task item 4 as follows:

- (a) Remove all corrosion, evaluate damage and repair or replace all discrepant structure as required, including application of protective finishes per Boeing Corrosion Prevention Manual (CPM) D6-82560 Section 20-50-00, or 737 Structural Repair Manual (SRM) D634A200, (-600), D634A201 (-700), D634A210 (-800), D634A211(-900), D634A333 (BBJ), or related service bulletin, as appropriate. Surface oxidation of ferrous metal fasteners may be handled by normal or existing maintenance practices.

SUBTASK 51-05-01-210-054

- (5) Do the CPCP Basic Task Item 5 as follows:

- (a) Clear any blocked holes or gaps that may hinder drainage, as applicable.

SUBTASK 51-05-01-210-055

- (6) CPCP Basic Task Item 6 is not applicable.

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SUBTASK 51-05-01-210-056

(7) Do the CPCP Basic Task Item 7 as follows:

NOTE: The term “local corrosion” and “light corrosion” are model specific and will be determined by the manufacturer and published in the appropriate maintenance documents.

An effective CPCP program is one that controls corrosion of all structure listed in the Baseline Program to Level 1 or better.

(a) Corrosion Level 1:

- 1) Corrosion occurring between successive inspections that is local and can be reworked / blended-out within manufacturers’ allowable limits (e.g., SRM, Service Bulletin, etc.), or;
- 2) Corrosion occurring between successive inspections exceeds allowable limits but is local and can be attributed to an event not typical of operator usage of other airplanes in the same fleet (e.g., Mercury spill), or;
- 3) Operator experience over several inspections has demonstrated only light corrosion between each scheduled inspection but the latest inspection and cumulative blend-out now exceeds allowable limits:

(b) Corrosion Level 2:

- 1) Corrosion occurring between successive inspections that requires a single reworked / blend-out which then exceed allowable limits, requiring a repair / reinforcement, or complete or partial replacement of structure listed in the Baseline Program, or;
- 2) Corrosion occurring between successive inspections that is widespread and requires a single blend-out approaching allowable rework limits.

NOTE: LEVEL 2 corrosion findings in an area require a program adjustment to reduce damage to Level 1 or better.

(c) Corrosion Level 3:

- 1) Corrosion found during the first and subsequent inspections, which is determined (normally by the operator) to be an urgent airworthiness concerns, requiring expeditious action.
- 2) Level 3 findings require timely inspections to verify the structural integrity of the remaining airplanes in the operator’s fleet. Reporting of CPCP findings is per FAR 121.703.
 - a) When Level 3 corrosion is found, consideration should be given to action required on other airplanes in the operator’s fleet. Details of the corrosion finding and planned action(s) should be expeditiously reported to the appropriate regulatory authority.

————— END OF TASK —————

TASK 51-05-01-210-806

7. 737-678 Basic Task Description

A. CPCP Basic Task

SUBTASK 51-05-01-210-057

(1) CPCP Basic Task Item 1 is not applicable.

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SUBTASK 51-05-01-210-058

(2) Do the CPCP Basic Task Item 2 as follows:

- (a) Prior to inspection clean the area as required to accomplish CPCP Basic Task Item 3. It is not necessary to remove normal amounts of sealant/leveling compound unless it has deteriorated to the point where moisture can penetrate down to the metal. A light uniform film of Corrosion Inhibiting Compound (CIC) that has not accumulated dirt or debris, will normally allow adequate inspection of the structure without removal. CIC may require removal if there are multiple layers and/or accumulations of dirt or debris.

SUBTASK 51-05-01-210-059

(3) Do the CPCP Basic Task Item 3 as follows:

- (a) Visually inspect all structure listed in the task description. The inspection method is as specified in each task description. Use Additional non-destructive inspections or visual inspections following partial disassembly if there are indications of hidden corrosion, such as bulging skins or corrosion running into splices, or under fittings, etc. In the task area, check the integrity of any sealant/leveling compound to determine if removal is required, and any corrosion inhibiting compound, particularly at faying surfaces, to determine if additional application is required per CPCP Basic Task Item 6.

SUBTASK 51-05-01-210-060

(4) Do the CPCP Basic Task item 4 as follows:

- (a) Remove all corrosion, evaluate damage and repair or replace all discrepant structure as required, including application of protective finishes per Boeing Corrosion Prevention Manual (CPM) D6-82560 Section 20-50-00, or 737 Structural Repair Manual (SRM) D634A200, (-600), D634A201 (-700), D634A210 (-800), D634A211(-900), D634A333 (BBJ), or related service bulletin, as appropriate. Surface oxidation of ferrous metal fasteners may be handled by normal or existing maintenance practices.

SUBTASK 51-05-01-210-061

(5) Do the CPCP Basic Task Item 5 as follows:

- (a) Clear any blocked holes or gaps that may hinder drainage, as applicable.

SUBTASK 51-05-01-210-062

(6) Do the CPCP Basic Task item 6 as follows:

- (a) Apply suitable approved water displacing / anti-corrosion compound as necessary.
 - 1) The minimum requirement for all areas (except as noted in CPCP Basic Task 6 (1) (a) 3)) is single coat of water displacing / anti-corrosion compound that penetrates faying surfaces and displaces moisture, e.g. a single coat of BMS 3-29 or BMS 3-23, where the initial or previous coat has been disturbed or removed.
 - 2) Not applicable
 - 3) List of areas / items where water displacing/anti-corrosion compounds should not be applied:

Water displacing / anti-corrosion compounds should not be applied in the following areas:

 - Cables, pulleys, wiring, plastics, elastomers, oxygen systems.
 - Lubricated or Teflon surfaces (E.g. greased joints, sealed bearings).
 - Over Cosmoline 1058 (or Equivalent per MIL-C-16173 Grade 1).
 - Adjacent to tears / holes in insulation blankets (water repelling characteristics are diminished).
 - Areas with electrical arc potential.

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- Interior materials, including cargo liners (change of flammability properties).
- Fiber-glass ducts where temperature exceeds 220 degrees F.
- Selected areas noted in baseline program.

SUBTASK 51-05-01-210-063

- (7) CPCP Basic Task Item 7 is not applicable.

————— END OF TASK —————

TASK 51-05-01-210-807

8. 737-678 Basic Task Description

A. CPCP Basic Task

SUBTASK 51-05-01-210-064

- (1) CPCP Basic Task Item 1 is not applicable.

SUBTASK 51-05-01-210-065

- (2) Do the CPCP Basic Task Item 2 as follows:

- (a) Prior to inspection clean the area as required to accomplish CPCP Basic Task Item 3. It is not necessary to remove normal amounts of sealant/leveling compound unless it has deteriorated to the point where moisture can penetrate down to the metal. A light uniform film of Corrosion Inhibiting Compound (CIC) that has not accumulated dirt or debris, will normally allow adequate inspection of the structure without removal. CIC may require removal if there are multiple layers and/or accumulations of dirt or debris.

SUBTASK 51-05-01-210-066

- (3) Do the CPCP Basic Task Item 3 as follows:

- (a) Visually inspect all structure listed in the task description. The inspection method is as specified in each task description. Use Additional non-destructive inspections or visual inspections following partial disassembly if there are indications of hidden corrosion, such as bulging skins or corrosion running into splices, or under fittings, etc. In the task area, check the integrity of any sealant/leveling compound to determine if removal is required, and any corrosion inhibiting compound, particularly at faying surfaces, to determine if additional application is required per CPCP Basic Task Item 6.

SUBTASK 51-05-01-210-067

- (4) Do the CPCP Basic Task item 4 as follows:

- (a) Remove all corrosion, evaluate damage and repair or replace all discrepant structure as required, including application of protective finishes per Boeing Corrosion Prevention Manual (CPM) D6-82560 Section 20-50-00, or 737 Structural Repair Manual (SRM) D634A200, (-600), D634A201 (-700), D634A210 (-800), D634A211(-900), D634A333 (BBJ), or related service bulletin, as appropriate. Surface oxidation of ferrous metal fasteners may be handled by normal or existing maintenance practices.

SUBTASK 51-05-01-210-068

- (5) Do the CPCP Basic Task Item 5 as follows:

- (a) Clear any blocked holes or gaps that may hinder drainage, as applicable.

SUBTASK 51-05-01-210-069

- (6) CPCP Basic Task Item 6 is not applicable.

SUBTASK 51-05-01-210-070

- (7) CPCP Basic Task Item 7 is not applicable.

————— END OF TASK —————

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TASK 51-05-01-210-808

9. 737-678 Basic Task Description

A. CPCP Basic Task

SUBTASK 51-05-01-210-071

(1) Do the CPCP Basic Task Item 1 as follows:

- (a) Remove all systems, equipment and interior furnishings, etc. (e.g. toilets, galleys, linings, installation) as necessary to accomplish CPCP Basic Task Item 3. It is not necessary to remove bushings unless specified in the Task Description, or if there is an indication of corrosion, or that the bushing has migrated.

SUBTASK 51-05-01-210-072

(2) Do the CPCP Basic Task Item 2 as follows:

- (a) Prior to inspection clean the area as required to accomplish CPCP Basic Task Item 3. It is not necessary to remove normal amounts of sealant/leveling compound unless it has deteriorated to the point where moisture can penetrate down to the metal. A light uniform film of Corrosion Inhibiting Compound (CIC) that has not accumulated dirt or debris, will normally allow adequate inspection of the structure without removal. CIC may require removal if there are multiple layers and/or accumulations of dirt or debris.

SUBTASK 51-05-01-210-073

(3) Do the CPCP Basic Task Item 3 as follows:

- (a) Visually inspect all structure listed in the task description. The inspection method is as specified in each task description. Use Additional non-destructive inspections or visual inspections following partial disassembly if there are indications of hidden corrosion, such as bulging skins or corrosion running into splices, or under fittings, etc. In the task area, check the integrity of any sealant/leveling compound to determine if removal is required, and any corrosion inhibiting compound, particularly at faying surfaces, to determine if additional application is required per CPCP Basic Task Item 6.

SUBTASK 51-05-01-210-074

(4) Do the CPCP Basic Task item 4 as follows:

- (a) Remove all corrosion, evaluate damage and repair or replace all discrepant structure as required, including application of protective finishes per Boeing Corrosion Prevention Manual (CPM) D6-82560 Section 20-50-00, or 737 Structural Repair Manual (SRM) D634A200, (-600), D634A201 (-700), D634A210 (-800), D634A211(-900), D634A333 (BBJ), or related service bulletin, as appropriate. Surface oxidation of ferrous metal fasteners may be handled by normal or existing maintenance practices.

SUBTASK 51-05-01-210-075

(5) Do the CPCP Basic Task Item 5 as follows:

- (a) Clear any blocked holes or gaps that may hinder drainage, as applicable.

SUBTASK 51-05-01-210-076

(6) Do the CPCP Basic Task item 6 as follows:

- (a) Apply suitable approved water displacing / anti-corrosion compound as necessary.
 - 1) The minimum requirement for all areas (except as noted in CPCP Basic Task 6 (1) (a) 3)) is single coat of water displacing / anti-corrosion compound that penetrates faying surfaces and displaces moisture, e.g. a single coat of BMS 3-29 or BMS 3-23, where the initial or previous coat has been disturbed or removed.
 - 2) Not applicable

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- 3) List of areas / items where water displacing/anti-corrosion compounds should not be applied:

Water displacing / anti-corrosion compounds should not be applied in the following areas:

- Cables, pulleys, wiring, plastics, elastomers, oxygen systems.
- Lubricated or Teflon surfaces (E.g. greased joints, sealed bearings).
- Over Cosmoline 1058 (or Equivalent per MIL-C-16173 Grade 1).
- Adjacent to tears / holes in insulation blankets (water repelling characteristics are diminished).
- Areas with electrical arc potential.
- Interior materials, including cargo liners (change of flammability properties).
- Fiber-glass ducts where temperature exceeds 220 degrees F.
- Selected areas noted in baseline program.

SUBTASK 51-05-01-210-077

- (7) Do the CPCP Basic Task Item 7 as follows:

NOTE: The term "local corrosion" and "light corrosion" are model specific and will be determined by the manufacturer and published in the appropriate maintenance documents.

An effective CPCP program is one that controls corrosion of all structure listed in the Baseline Program to Level 1 or better.

- (a) Corrosion Level 1:

- 1) Corrosion occurring between successive inspections that is local and can be reworked / blended-out within manufacturers' allowable limits (e.g., SRM, Service Bulletin, etc.), or;
- 2) Corrosion occurring between successive inspections exceeds allowable limits but is local and can be attributed to an event not typical of operator usage of other airplanes in the same fleet (e.g., Mercury spill), or;
- 3) Operator experience over several inspections has demonstrated only light corrosion between each scheduled inspection but the latest inspection and cumulative blend-out now exceeds allowable limits:

- (b) Corrosion Level 2:

- 1) Corrosion occurring between successive inspections that requires a single reworked / blend-out which then exceed allowable limits, requiring a repair / reinforcement, or complete or partial replacement of structure listed in the Baseline Program, or;
- 2) Corrosion occurring between successive inspections that is widespread and requires a single blend-out approaching allowable rework limits.

NOTE: LEVEL 2 corrosion findings in an area require a program adjustment to reduce damage to Level 1 or better.

- (c) Corrosion Level 3:

- 1) Corrosion found during the first and subsequent inspections, which is determined (normally by the operator) to be an urgent airworthiness concerns, requiring expeditious action.

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- 2) Level 3 findings require timely inspections to verify the structural integrity of the remaining airplanes in the operator's fleet. Reporting of CPCP findings is per FAR 121.703.
 - a) When Level 3 corrosion is found, consideration should be given to action required on other airplanes in the operator's fleet. Details of the corrosion finding and planned action(s) should be expeditiously reported to the appropriate regulatory authority.

————— **END OF TASK** —————

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INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING

1. General

A. This procedure has one task:

- (1) Airplane surface preparation for application of finish.

TASK 51-21-00-100-801

2. Airplane Surface Preparation for Application of Finish

A. References

Reference	Title
51-21-11-150-801	Paint Stripping (P/B 701)
51-21-31-350-801	Removal and Control of Corrosion for Aluminum and Aluminum Alloys (P/B 701)
51-21-31-350-802	Removal and Control of Corrosion for Magnesium Alloys (P/B 701)
51-21-31-350-803	Removal and Control of Corrosion for Carbon Steel (P/B 701)
51-21-31-350-804	Removal and Control of Corrosion for Stainless Steel and Nickel-Chromium Alloys (P/B 701)
51-21-31-350-805	Removal and Control of Corrosion for Titanium Alloys (P/B 701)
51-21-31-350-806	Removal and Control of Corrosion for Plated or Phosphated Surfaces (P/B 701)
SRM 51-70-14	Structural Repair Manual

B. Consumable Materials

Reference	Description	Specification
B00166	Abrasive - pumice	
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B00402	Cleaner - Aerospace Equipment	MIL-PRF-87937
G02088	Abrasive - Silicon Carbide, Waterproof Paper	ANSI B74.18
G02222	Abrasive - Dry, Blasting	BAC5748

C. Prepare the surface

SUBTASK 51-21-00-100-001

- (1) Before you apply finish to a surface, you must correctly prepare the surface, as follows:

CAUTION: DO NOT USE PAINT STRIPPER ON COMPOSITE MATERIALS. IF YOU USE PAINT STRIPPERS ON COMPOSITE MATERIALS, THE COMPOSITE MATERIALS WILL BE STRUCTURALLY DAMAGED.

- (a) To remove the damaged finish, do this task: Paint Stripping, TASK 51-21-11-150-801.
 - 1) Use approved compounds to remove the damaged finishes.
 - a) Solvents are used to remove paint from small areas.
 - b) Stripping Compounds are used to remove paint from large areas or disassembled parts.
 - c) Mechanical Strippers are used to remove paint from composite materials.
- (b) To remove the corrosion, do one of the following tasks:
 - 1) for Aluminum and Aluminum Alloys, do this task: Removal and Control of Corrosion for Aluminum and Aluminum Alloys, TASK 51-21-31-350-801.
 - 2) for Magnesium Alloys, do this task: Removal and Control of Corrosion for Magnesium Alloys, TASK 51-21-31-350-802.

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- 3) for Carbon Steel, do this task: Removal and Control of Corrosion for Carbon Steel, TASK 51-21-31-350-803.
 - 4) for Stainless Steel and Nickel-Chromium Alloys, do this task: Removal and Control of Corrosion for Stainless Steel and Nickel-Chromium Alloys, TASK 51-21-31-350-804.
 - 5) for Titanium Alloys, do this task: Removal and Control of Corrosion for Titanium Alloys, TASK 51-21-31-350-805.
 - 6) for Plated or Phosphated Surfaces, do this task: Removal and Control of Corrosion for Plated or Phosphated Surfaces, TASK 51-21-31-350-806.
 - 7) Listed below are more than one approved method of corrosion removal:
 - a) chemical treatments
 - b) hand sanding with abrasive paper or metal wool
 - c) mechanical sanding with abrasive mats
 - d) dry abrasive blasting.
 - 8) The procedures you use must agree with the type of material and the quantity of the corrosion.
- (c) Clean the surface with one or more of these approved methods:

NOTE: To get satisfactory results, you must make sure the surface is fully clean before you apply paints or finishes.

- 1) Use solvent, B00184, or
- 2) Use cleaner, B00402, or

CAUTION: BE CAREFUL WHEN YOU USE ABRADING MATERIAL. ABRADING MATERIAL CAN EXPOSE OR DAMAGE FIBERGLASS, ARAMID, OR GRAPHITE FIBERS. DAMAGED OR EXPOSED FIBERS WILL CAUSE THE COMPONENT TO BE REJECTED.

- 3) Use 150 grit or finer abrasive, G02088 by hand, or

NOTE: You can also do dry abrasive blasting with abrasive, G02222 if necessary.

- 4) Scrub the area thoroughly with a slurry of pumice abrasive, B00166 powder 4F and water.

- (d) Apply a conversion coating (on some surfaces).
- 1) Some conversion coatings are applied to make a protective layer on metal surfaces to prevent damage.
 - 2) The layer is formed by a chemical procedure which will change the surface metal into an oxide layer.
 - 3) Different conversion coating applications are used with different metals.
 - 4) Chromic acid or an equivalent oxidizing agent will make a thin tight layer and prevent corrosion.

SUBTASK 51-21-00-380-001

- (2) To apply flame-sprayed aluminum, (SRM 51-70-14).

————— END OF TASK —————

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PAINT STRIPPING - CLEANING/PAINTING

1. General

A. This procedure has one task:

- (1) Paint stripping.

TASK 51-21-11-150-801

2. Paint Stripping

A. General

(1) This task tells how to remove:

- (a) paints
- (b) primers
- (c) adhesive primers
- (d) rain erosion coating from fiberglass

(2) You can remove paint from metal surfaces with paint strippers or solvents.

- (a) You can usually use a solvent to remove small quantities of paint.
- (b) Do not use paint strippers on these materials:

NOTE: Only use approved solvents on these materials.

- 1) plastic laminates
- 2) composites
- 3) aerodynamic smoother
- 4) edges of metal bonds
- 5) rubber parts

CAUTION: DO NOT USE PAINT STRIPPERS ON COMPOSITE PANELS. PAINT STRIPPERS CAN CAUSE DAMAGE TO THE COMPOSITE PANELS.

(3) Use mechanical tools to remove the paint from the composite surfaces.

(4) You can use a pressure sprayer gun, STD-447 or a brush to apply the paint strippers.

- (a) The brush-on procedure is frequently used for line maintenance.

(5) Before you remove the paint with the stripping procedure, make sure the surface is clean and dry.

- (a) Make sure the ambient temperature is between 50°F (10°C) and 100°F (38°C).

NOTE: Do not use the stripping procedure in hot or wet weather.

(6) You can use the materials that follow to clean the surface before it is stripped.

- (a) alkaline solvent
- (b) emulsion cleaning agents
- (c) degreasing solvents
- (d) vapor degreasers
- (e) manual cleaning

(7) Make sure the components in the paint stripper mixture are fully mixed.

- (a) Keep the container of paint stripper fully closed when it is not being used.

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CAUTION: DO NOT LET PAINT STRIPPERS FALL ON TEFLON LINED SELF-LUBRICATED BEARINGS, ELECTRICAL TERMINAL PLUGS, NYLON-COATED WIRES AND NYLON BUSHINGS. THE CHEMICAL COMPOUNDS IN THE PAINT STRIPPERS CAN CAUSE DAMAGE TO THE AIRPLANE COMPONENTS.

- (8) You must protect the surfaces and parts which are easily damaged by paint strippers.
 - (a) Put the applicable tape or covers on the parts below:
 - 1) lubricated parts
 - 2) rubber parts
 - 3) laminated plastics surfaces or parts
 - 4) composite surfaces or parts
 - 5) aerodynamic smoothers
 - 6) and metal bonded edges
- (9) Apply not less than 1.00 in. (25.40 mm) of tape to all adjacent access doors, fairings, and wing leading and trailing edges.
 - (a) Apply the tape to the areas that are adjacent to the area being stripped.
- (10) Apply the tape on the drain holes and vents.
- (11) Apply the tape on the pressurized drain valves.
- (12) Make sure the paint strippers do not fall on the joints.
- (13) Do not use paint strippers in the fuel tanks.
- (14) Strippers that you apply with a brush or with a spray gun contain agents that make a solution thick.
 - (a) Apply these strippers on vertical and horizontal surfaces.
- (15) Strippers that you apply with a cloth are used to remove temporary finishes, waxes, and oversprays.
- (16) Strippers should meet the requirements of Standard Overhaul Practices Manual (SOPM) 20-30-02. In addition to this procedure, Boeing specifications BAC 5725 and BAC 5771 provide procedures for paint stripping.

B. References

Reference	Title
20-30-31-910-801	Cleaners and Polishes (P/B 201)
20-30-83-910-801	General Cleaning of Composites (Series 83) (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved (Part #: 1-6390-A, Supplier: 63318, A/P Effectivity: 737-ALL) (Part #: 10810, Supplier: \$0855, A/P Effectivity: 737-ALL) (Part #: 234350, Supplier: \$0857, A/P Effectivity: 737-ALL) (Part #: 311, Supplier: KA861, A/P Effectivity: 737-ALL) (Part #: 411B60, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: 411B90, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: DAD5013, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: DFD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: J5-0275-2010, Supplier: 435R8, A/P Effectivity: 737-ALL) (Part #: SCD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: ST982LF, Supplier: 3Z323, A/P Effectivity: 737-ALL) (Part #: TS1275-4, Supplier: 1DWR5, A/P Effectivity: 737-ALL)
STD-133	Brush - Stiff Bristle, Non-metallic
STD-447	Gun - Pressure Sprayer
STD-763	Scraper
STD-1080	Brush - Paint

D. Consumable Materials

Reference	Description	Specification
B00047	Acid, Technical Grade, Nitric (61%-68.2% Purity)	A-A-59105
B00068	Alcohol - Ethyl (Denatured)	AMS 3002F (MIL-E-51454, Type II)
B00074	Solvent - Degreasing	MIL-PRF-680 (Supersedes P-D-680)
B00083	Solvent - Aliphatic Naphtha (For Acrylic Plastics)	TT-N-95 Type II, ASTM D-3735 Type III
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00130	Alcohol - Isopropyl	TT-I-735
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00151	Solvent - Methyl Isobutyl Ketone	ASTM D1153
B00153	Solvent - Toluene, Nitration	JAN-T-171, Grade A
B00342	Alcohol - N-Butyl (Butanol)	ASTM D304
B00344	Solvent - Xylene, Nitration Grade	ASTM D843
B01003	Solvent - General Cleaning Of Composites (AMM 20-30-83/201) - Series 83	
B01040	Cleaner - Oakite Isoprep 177	
C00167	Acid, Chromic (Chromium Trioxide)	A-A-55827
E00002	Stripper - Paint - Turco 5351	
E00003	Stripper - Paint - Turco 4338	
E00130	Compound - Polysulfide, Polyurethane, And Epoxy Paint Remover	BAC5725
E00229	Compound - Epoxy Paint Remover	BAC5725
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00116	Sponge - Synthetic	
G00365	Paper	
G02145	Tape - Aluminum Foil	BMS8-289

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Reference	Description	Specification
G02428	Abrasive - Aluminum Oxide Paper, 150 grit	A-A-1048
G50077	Abrasive - Aluminum Oxide Paper, 240 grit or finer	

E. Prepare to do the Paint Stripping

SUBTASK 51-21-11-950-001

- (1) Apply masking tape, G02145 to the areas that you will not strip, or to the areas that will be damaged by the stripper.
 - (a) Put applicable plastic coated paper, G00365 covers on areas which are easily damaged by the strippers.

NOTE: You can use equivalent plastic sheeting which is resistant to paint strippers.

- 1) Use some of the materials that follow to protect the surface:
 - a) paper masking tape
 - b) plastic coated paper
 - c) plastic sheeting
 - d) wrapping paper, chemically neutral

SUBTASK 51-21-11-110-001

- (2) Do the steps that follow to clean the area:

NOTE: Use solvent, B00083 or solvent, B00074 for this step.

- (a) Remove the loose dirt, grease, and oil with solvent, B00074 or solvent, B00083.

NOTE: Be careful not to put solvent on a larger area than it is necessary.

- (b) Clean the surface with a cotton wiper, G00034, soft paint brush, STD-1080, or a sponge, G00116 that is moist with solvent, B00074 or solvent, B00083.

NOTE: You can use a spray gun to help clean the surface.

- (c) Flush the surface with clean solvent, B00074 or solvent, B00083.

- 1) Rub the surface with a clean cotton wiper, G00034.

- (d) Remove all unwanted solvent.

- (e) Let the surface dry.

SUBTASK 51-21-11-110-002

- (3) Do these steps to clean the area again:

CAUTION: YOU MUST FULLY CLEAN THE SURFACE BEFORE YOU STRIP PAINTS OR ADHESIVES. USE ALIPHATIC NAPHTHA IN THE LAST STEP OF THE PROCEDURE TO CLEAN THE SURFACE. DO NOT USE P-D-680, TYPE I FOR THE LAST STEP OF THE PROCEDURE TO CLEAN THE SURFACE. DAMAGE TO THE SURFACE CAN OCCUR IF P-D-680, TYPE I IS USED IN THE LAST STEP.

- (a) Use a spray bottle to apply the solvent, B00083 on the surface.
- (b) Clean the surface with a clean cotton wiper, G00034 until all large pieces of dirt are removed.

NOTE: Use a soft bristle brush for the cleaning if it is necessary.

- (c) Clean the surface again until no signs of the dirt are found on a clean cotton wiper, G00034.

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- (d) Dry the area with a clean dry cotton wiper, G00034.

NOTE: Do not let drops of solvent dry on the surface.

F. Brush-on or Spray Paint Stripping

SUBTASK 51-21-11-150-001

WARNING: DO NOT GET ORGANIC-PAINT STRIPPERS IN YOUR MOUTH, IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. DO NOT BREATHE THE FUMES FROM THE ORGANIC-PAINT STRIPPERS. MAKE SURE THE AIR FLOWS FREELY THROUGH THE WORK AREA. USE CHEMICAL-RESISTANT GLOVES, HATS, COATS, GOGGLES OR PLASTIC FACE SHIELDS WHEN YOU USE THE ORGANIC-PAINT STRIPPERS. IMMEDIATELY USE WATER TO REMOVE THE ORGANIC-PAINT STRIPPER THAT TOUCHES YOUR SKIN. KEEP THE ORGANIC-PAINT STRIPPERS AWAY FROM SPARKS, FLAME, AND TEMPERATURES ABOVE THE FLASHPOINT. THE ORGANIC-PAINT STRIPPERS ARE HAZARDOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT. REFER TO THE APPLICABLE FIRE, INDUSTRIAL HYGIENE, AND SAFETY STANDARDS FOR THE SAFE USE OF ORGANIC-PAINT STRIPPERS.

- (1) Do the paint stripping (see Table I for the approved stripping materials).

NOTE: Strip only an area that can be worked at one time.

- (a) Fully mix the strippers.

NOTE: Refer to the manufacturer's instructions to mix the paint stripper.

- (b) Apply large quantities of the stripper on the paint.

NOTE: Keep the surface wet with the stripper.

- 1) Put the stripper on with a natural bristle paint brush, STD-1080 or a non-atomizing spray.
- 2) Add more layers of the stripper if it is necessary.

- (c) Let the stripper stay on the surface a sufficient time for the finish to become soft and become wrinkled.

CAUTION: DO NOT USE ABRASIVE PADS (SCOTH-BRITE), OR ABRASIVE PAPER ON THE ALUMINUM SURFACE UNLESS THE SCRIBE LINE INSPECTIONS WERE MADE. ABRASIVE PADS CAN SMOOTH THE ALUMINUM SURFACE AND HIDE THE SCRIBE LINE MARKS. IF YOU USE ABRASIVE PADS TO REMOVE THE PAINT OR REQUIRED TO DO REPEAT INSPECTIONS BASED ON THE SCRIBE LINE INSPECTION SERVICE BULLETIN.

CAUTION: ONLY USE APPROVED SCRAPERS ON THE AIRPLANE SKIN. SCRAPERS THAT ARE NOT APPROVED CAN MAKE SCRATCHES ON THE SKIN, AND CAUSE FATIGUE CRACKS.

- (d) Remove the loosened material with a bristle paint brush, STD-1080 or with a sealant removal tool, COM-2481 before the stripper becomes dry.
- (e) Flush the area fully with clean water to remove the remaining stripper and loose finish.
- (f) Dry the surface with a cotton wiper, G00034.
- 1) Make sure the surface is fully dry.

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G. Remove the Epoxy Adhesives and Adhesive Primers

SUBTASK 51-21-11-150-002

CAUTION: MAKE SURE THAT YOU REFER TO THE MANUFACTURER INSTRUCTIONS WHEN YOU APPLY THE STRIPPER THE SURFACE. IF YOU DO NOT FOLLOW THE MANUFACTURER'S INSTRUCTIONS, DAMAGE CAN OCCUR TO THE SURFACE.

(1) Do the epoxy adhesive and adhesive primer stripping (see Table I for the approved stripping materials).

(a) Fully mix the strippers.

NOTE: Refer to the manufacturer's instructions to mix the adhesive stripper.

(b) Apply the stripper on the surface to be removed.

NOTE: Keep the surface wet with the stripper.

(c) Apply a small quantity of stripper on the adhesive or the primer with a paint brush, STD-1080.

(d) Let the stripper absorb the adhesive or the primer for not more than 30 minutes.

NOTE: Do not let the stripper touch or fall on aluminum surfaces.

CAUTION: DO NOT USE ABRASIVE PADS (SCOTH-BRITE), OR ABRASIVE PAPER ON THE ALUMINUM SURFACE UNLESS THE SCRIBE LINE INSPECTIONS WERE MADE. ABRASIVE PADS CAN SMOOTH THE ALUMINUM SURFACE AND HIDE THE SCRIBE LINE MARKS. IF YOU USE ABRASIVE PADS TO REMOVE THE PAINT OR REQUIRED TO DO REPEAT INSPECTIONS BASED ON THE SCRIBE LINE INSPECTION SERVICE BULLETIN.

CAUTION: ONLY USE APPROVED SCRAPERS ON THE AIRPLANE SKIN. SCRAPERS THAT ARE NOT APPROVED CAN MAKE SCRATCHES ON THE SKIN, AND CAUSE FATIGUE CRACKS.

(e) Remove the stripper and loosened adhesive, or the primer with a cotton wiper, G00034, or a sealant removal tool, COM-2481.

(f) Apply the stripper again, if it is necessary, to remove all unwanted adhesive or the primer.

(g) Flush the surface with a sponge, G00116 that is soaked with clean water.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. SOLVENTS MAY BE FLAMMABLE OR HARMFUL TO THE ENVIRONMENT. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

1) As an alternative to water, you can use Series 83 solvent, B01003 (TASK 20-30-83-910-801) to clean the surface.

(h) Dry the surface fully with a clean dry cotton wiper, G00034.

H. Dry Abrasive Stripping of Composites

SUBTASK 51-21-11-150-003

(1) Do the stripping to the composite substrates.

(a) Remove the enamel or topcoat with 150 grit abrasive paper, G02428 or finer paper.

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- 1) Abrade (sand) the topcoat equally down to the primer surface.

NOTE: It is not necessary to remove the primers for the reapplication of primer, enamels, or a topcoat.

- (b) Abrade (sand) and feather the primer and enamel layers with 240 grit or finer abrasive paper, G50077.

NOTE: Do not damage the fiber of the composite substrate.

NOTE: If the substrate has a conductive coating, abrade (sand) off all of the layers in the area to be repainted. This is to get a constant conductivity after the paint touch-up.

I. Stripping of High Temperature Primer

SUBTASK 51-21-11-150-004

- (1) Do the stripping of the High Temperature Primer (see Table I for the approved stripping materials).

CAUTION: DO NOT USE WATER UNTIL THE PRIMER IS REMOVED. WATER MAKES THE EPOXY HARD. DAMAGE TO THE SURFACE CAN OCCUR IF THE EPOXY BECOMES HARD.

- (a) Apply a thick layer of stripper, full strength, with a paint brush, STD-1080.
 - 1) Do not use force to apply the paint stripper on the primer.
- (b) Permit sufficient time to loosen the primer (20 minutes to 1 hour).
- (c) When the primer is loose, fully rub the area with a rigid bristle paint brush, STD-1080.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. SOLVENTS MAY BE FLAMMABLE OR HARMFUL TO THE ENVIRONMENT. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (d) Clean the area with Series 83 solvent, B01003 (TASK 20-30-83-910-801).
 - 1) Use a brush or spray gun to clean the area.
- (e) Dry the surface fully with a clean dry cotton wiper, G00034.

J. Remove the Rain Erosion Coating from Fiberglass

SUBTASK 51-21-11-150-005

- (1) Do the stripping to remove the rain erosion coating.

WARNING: DO NOT GET TOLUENE IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM TOLUENE. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE TOLUENE. KEEP TOLUENE AWAY FROM SPARKS, FLAME, AND TEMPERATURES ABOVE THE FLASHPOINT. TOLUENE IS A HAZARDOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Put clean cloths that are moist with toluene (solvent, B00153) on the rain erosion coating.

CAUTION: MAKE SURE THE TOLUENE DOES NOT STAY ON THE FIBERGLASS FOR MORE THAN 2 HOURS. DAMAGE TO THE SURFACE CAN OCCUR IF THE STRIPPER STAYS ON THE SURFACE FOR MORE THAN 2 HOURS.

- (b) If it is necessary, add more toluene solvent, B00153 to keep the cloths moist.
 - 1) Permit sufficient time to loosen the coating from the fiberglass (20 minutes to 1 hour).

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- (c) Remove the loosened rain erosion coating with a bristle brush, STD-133 or a wood scraper, STD-763 before the toluene solvent, B00153 dries.
- (d) Lightly abrade (sand) the surface with 240 grit (minimum) abrasive paper (abrasive cloth, B00102).
- (e) Clean the area with xylene solvent (solvent, B00344).
- (f) Dry the surface fully with a clean, dry cheesecloth (cotton wiper, G00034).

K. Selection of Strippers

SUBTASK 51-21-11-150-006

- (1) Find the appropriate stripper in this table.

Table 701/51-21-11-993-801 SELECTION OF STRIPPERS

ORGANIC MATERIAL TO BE REMOVED	SUBSTRATE MATERIAL	APPROVED STRIPPER	OPERATING TEMPERATURE
Epoxy primers, topcoats	Alloy Steels - above 220 ksi	Cee Bee A-215 (MIL-R-81294D)	55-90 deg. F 13-32 deg. C Recommended 65-80 deg. F 18.3-26.7 deg. C
	Aluminum and Aluminum Alloys	Turco 5351 - Thick (T.O. 1-1-8)	50-100 deg. F 10-37.8 deg. C Recommended 65-80 deg. F 18.3-26.7 deg. C
Polyurethanes	Corrosion Resistant Alloy	Turco 5469 - Thick (MIL-R-81294)	50-100 deg. F 10-37.8 deg. C Recommended 65-80 deg. F 18.3-26.7 deg. C
Alkyds	Nickel/Cobalt Based Alloy	Turco 5469 (MIL-R-81294)	50-100 deg. F 10-37.8 deg. C Recommended 65-80 deg. F 18.3-26.7 deg. C
Polysulfides	Titanium and Titanium Alloys, except Magnesium	Turco 5469 (MIL-R-81294)	50-100 deg. F 10-37.8 deg. C Recommended 65-80 deg. F 18.3-26.7 deg. C
Epoxy primers, topcoats	Aluminum	Cee Bee A-202 (AMS 1376)	50-100 deg. F 10-37.8 deg. C Recommended 65-80 deg. F 18.3-26.7 deg. C
	Aluminum and Aluminum Alloys	Chromic Acid (O-C-303) / Nitric Acid (O-N-350) mix	165 +/- 10 deg. F 73.9 +/- 5.6 deg. C
	Titanium	Chromic Acid (O-C-303) / Nitric Acid mix (O-N-350)	165 +/- 10 deg. F 73.9 +/- 5.6 deg. C

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ORGANIC MATERIAL TO BE REMOVED	SUBSTRATE MATERIAL	APPROVED STRIPPER	OPERATING TEMPERATURE
High Temperature Coating for Titanium	Titanium (Immersion Only)	Isoprep 177 Turco 4338	185 +/- 5 deg. F 85 +/- 2.8 deg. C
Temporary markings, temporary coatings, waxes, and uncured overspray	All, including composites	Use an applicable stripper from Cleaners and Polishes, TASK 20-30-31-910-801 .	
All epoxies, alkyds, polyurethanes, other coatings, primers, topcoats	Magnesium	Dry Abrasive Blast with MIL-G-5634, Type I, II or III	
Bonding adhesives, adhesive primers for bonding	Aluminum	Turco 5351 - Thick (T.O. 1-1-8)	50-100 deg. F 10-37.8 deg. C Recommended 65-80 deg. F 18.3-26.7 deg. C
		Turco 5469 - Thin (MIL-R-81294)	50-100 deg. F 10-37.8 deg. C Recommended 65-80 deg. F 18.3-26.7 deg. C
	Titanium	Chromic Acid (O-C 303) / Nitric Acid (O-C-350)	165 +/- 10 deg. F 73.9 +/- 10 deg. C
	All Stainless Steel	Turco 5351 - Thick (T.O. 1-1-8)	50-100 deg. F 10-37.8 deg. C Recommended 65-80 deg. F 18.3-26.7 deg. C

(a) List of approved materials for stripping:

- 1) Abrasive, MIL-G-5634, Type I, II, and III (or an applicable equivalent)
- 2) Oakite Isoprep 177 cleaner, B01040 (or an applicable equivalent)
- 3) Turco 5469, (paint removing compound, E00130)
- 4) Turco 5351 stripper, E00002 -Thick, T.O.1-1-8 (or an applicable equivalent)
- 5) Turco 4338 stripper, E00003 (or an applicable equivalent)
- 6) Cee Bee R-256A, (paint removing compound, E00130)
- 7) Ethyl Alcohol, (alcohol, B00068)
- 8) Cee Bee A-202 (paint removing compound, E00229)
- 9) Chromic Acid, (acid, C00167)
- 10) Nitric Acid, (acid, B00047)
- 11) Butyl Alcohol, (alcohol, B00342)
- 12) Isopropyl Alcohol, (alcohol, B00130)
- 13) Aliphatic Naphtha, (solvent, B00083)

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- 14) Dry Cleaning Solvent, (solvent, B00074)
- 15) Methyl Ethyl Ketone (MEK), (solvent, B00148)
- 16) Methyl Isobutyl Ketone (MIBK), (solvent, B00151)

————— **END OF TASK** —————

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HEAT AND CORROSION RESISTANT FINISH - CLEANING/PAINTING

1. General

A. This section contains three procedures:

- (1) Repair of Heat and Corrosion Resistant Coating BMS14-4, TYPE I (coating, C00250)
- (2) Repair of Heat and Corrosion Resistant Coating BMS14-4, TYPE II (coating, C00251)
- (3) Repair of Heat and Corrosion Resistant Coating BMS14-4, TYPE III (coating, C00939)

B. The coating, C00251 is a silicate base water dispersed coating pigmented with aluminum - zinc powder. It is a catalyzed coating which cures at ambient temperature.

C. You must shake the coating, C00251 for a long time before you use the material to keep it from settling and clumping.

D. While you apply the coating, C00251, you must continuously shake the material to keep it from settling and clumping.

E. The relative humidity must be between 35 and 65 percent when you apply the coating, C00251.

F. Make sure you follow the manufacturers instruction to apply the coating, C00251.

TASK 51-21-12-370-801

2. Repair the BMS14-4 Type I Corrosion Resistant Coating

A. References

Reference	Title
20-30-84-910-801	Final Cleaning of Metal Prior to Painting (Series 84) (P/B 201)
51-21-99-300-801	Decorative Exterior Paint System Application (P/B 701)

B. Tools/Equipment

Reference	Description
STD-1080	Brush - Paint
STD-1133	Gun - Spray, Paint, with Interchangeable Nozzles

C. Consumable Materials

Reference	Description	Specification
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B01004	Solvent - Final Cleaning Of Metal Prior To Painting (AMM 20-30-84/201) - Series 84	
C00250	Coating - Inorganic, Heat, Weather And Oil Resistant Protective Coating (Elevated Temperature Cure)	BMS14-4, Type I
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G02222	Abrasive - Dry, Blasting	BAC5748

D. Prepare the Surface

SUBTASK 51-21-12-120-001

- (1) Dry abrasive blast the damaged area to bare, clean metal with a clean (preferably new) 80, 100, or 120 grit aluminum oxide abrasive, G02222.
 - (a) Blow the area with clean dry air to remove the remaining abrasive material.
 - (b) Do not touch the clean parts with your bare hands to prevent contamination of the surface.

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- (c) Protect the parts that were abrasive blasted until the parts are coated with coating, C00250.

NOTE: The BMS14-4 Type I must be applied in less than four hours after the dry abrasive blast.

SUBTASK 51-21-12-120-002

- (2) Use abrasive cloth, B00102 or abrasive mat, G00251 to abrade (sand) the area to feather the edges of the damaged coating.
- (a) Scuff an area approximately 1/2 inch in width around the edge of the bare metal.

SUBTASK 51-21-12-100-001

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. PUT ON A RESPIRATOR, PROTECTIVE SPLASH GOGGLES, AND GLOVES WHEN YOU USE SOLVENTS. KEEP THE SOLVENTS AWAY FROM SPARKS, FLAME, AND HEAT. SOLVENTS ARE POISONOUS AND FLAMMABLE. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (3) Clean the surface with Series 84 solvent, B01004 (TASK 20-30-84-910-801).

E. Apply the coating, BMS14-4, Type I

NOTE: Use spray painting equipment that continuously stirs the material to be sprayed and which is free from organic contaminants. Coat the parts with the BMS14-4, Type I material to get an equal, smooth, wet coating.

SUBTASK 51-21-12-390-001

- (1) Apply the coating, C00250 with a spray paint spray gun with interchangeable nozzles, STD-1133 or a paint brush, STD-1080.
- (a) Apply the coating to the surface with one of the steps that follow:
- 1) Apply the coating with one pass of the spray gun.
 - 2) Apply two or three thin coats in 1 to 5 minutes of the other, at right angles to the previous pass.
- NOTE:** This is necessary to prevent cracks or sags, and to keep the orange peel to a minimum.
- (b) The coating may be applied to the areas of the part that are not easy to spray paint with the items listed below followed immediately by spray coating the remaining areas of the part with the spray gun.
- 1) stencil gun
 - 2) airbrush
 - 3) hand brush.
- (c) Do not apply too much of the coating, C00250 because it will cause, runs, beads, drips, or curtains.
- 1) The conditions above can cause blistering, pitting, flaking, glazing, or heavy green discoloration during curing.
- (d) Make sure the coating is not too dry when it is applied because it will give a rough or sandy texture.
- 1) These rough areas are porous and can cause decreased corrosion protection and a decrease in the coating bond.
- (e) Dry the parts coated with coating, C00250 for at least 15 minutes and then dry for 15 to 30 minutes at 175 ± 25°F.

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- 1) The coating must be smooth and not have any fish eyes.
2) The coating must have a smooth grey color after it is dry.
3) Cure the coating for 4 hours at 300 +/- 50°F.
4) You must see no lumps or runs in the cured coating.
5) The total coating must be 0.0015 to 0.0035 inches thick.

NOTE: When is not at this specified thickness, you must apply more coats of the BMS14-4 Type I to get the specified thickness.

- (f) To apply the specified overcoat systems, do this task: Decorative Exterior Paint System Application, TASK 51-21-99-300-801.

END OF TASK

TASK 51-21-12-370-802

3. Repair the BMS14-4 Type II Heat and Corrosion Resistant Coating

A. References

Table with 2 columns: Reference, Title. Row 1: 20-30-84-910-801, Final Cleaning of Metal Prior to Painting (Series 84) (P/B 201)

B. Tools/Equipment

Table with 2 columns: Reference, Description. Row 1: STD-1080, Brush - Paint. Row 2: STD-1133, Gun - Spray, Paint, with Interchangeable Nozzles

C. Consumable Materials

Table with 3 columns: Reference, Description, Specification. Row 1: B00102, Abrasive - Aluminum Oxide Coated Cloth, ANSI B74.18. Row 2: B01004, Solvent - Final Cleaning Of Metal Prior To Painting (AMM 20-30-84/201) - Series 84. Row 3: C00251, Coating - Inorganic, Heat, Weather And Oil Resistant Protective Coating (Room Temperature Catalytic Cure), BMS14-4, Type II

D. Prepare the Surface

SUBTASK 51-21-12-120-003

- (1) Use aluminum oxide abrasive cloth, B00102 to abrade (sand) the damaged area to bare, clean metal with 180 grit or finer.
(a) Abrade (sand) the area if it is necessary to feather the edges of the not damaged coating.

SUBTASK 51-21-12-100-002

- (2) Clean the surface with Series 84 solvent, B01004 (TASK 20-30-84-910-801).

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E. Apply the coating, BMS14-4, Type II

SUBTASK 51-21-12-390-002

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. PUT ON A RESPIRATOR, PROTECTIVE SPLASH GOGGLES, AND GLOVES WHEN YOU USE SOLVENTS. KEEP THE SOLVENTS AWAY FROM SPARKS, FLAME, AND HEAT. SOLVENTS ARE POISONOUS AND FLAMMABLE. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Apply the coating, C00251 with a spray paint spray gun with interchangeable nozzles, STD-1133 or a paint brush, STD-1080 as follows.
(a) Areas of the part that are not easy to spray paint can be done with a stencil gun, airbrush, or hand brush first.
1) Follow this immediately by spray coating the remaining areas of the part with a spray gun.
(b) Do not apply too much of the coating, C00251 because it will cause, runs, beads, drips, or curtains.
1) The conditions above can cause blistering, pitting, flaking, glazing, or heavy green discoloration during curing.
(c) Make sure the coating is not too dry when it is applied because it will produce a rough or sandy texture.
1) These rough areas are porous and can cause decreased corrosion protection and a decrease in the coating bond.
(d) Dry the coated parts for 30 to 45 minutes at ambient temperature.
1) The coating must be smooth and not have any fish eyes.
2) The coating must have a equal gray color after it is dry.
(e) Apply one coat of coating, C00251 catalyst to the coated area.
1) Let the catalyst cure for a minimum of 16 hours at ambient temperature.

NOTE: Do not pre-mix the coating with the catalyst, and do not let the catalyst touch the adjacent surfaces.

a) As an alternative, you can cure the catalyst for 4 hours at 300 ± 50°F.

- 2) You must see no lumps or runs in the cured coating.
3) The total coating must be 0.0015 to 0.0035 inches thick.

NOTE: When is not at the specified thickness, you must apply more coats to get the specified thickness.

END OF TASK

TASK 51-21-12-370-803

4. Repair the BMS14-4 Type III Corrosion Resistant Coating

A. References

Table with 2 columns: Reference, Title. Rows include 20-30-84-910-801 (Final Cleaning of Metal Prior to Painting) and 51-21-99-300-801 (Decorative Exterior Paint System Application).

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B. Tools/Equipment

Reference	Description
STD-1080	Brush - Paint
STD-1133	Gun - Spray, Paint, with Interchangeable Nozzles

C. Consumable Materials

Reference	Description	Specification
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B01004	Solvent - Final Cleaning Of Metal Prior To Painting (AMM 20-30-84/201) - Series 84	
C00250	Coating - Inorganic, Heat, Weather And Oil Resistant Protective Coating (Elevated Temperature I Cure)	BMS14-4, Type I
C00939	Coating - Inorganic, Heat, Weather And Oil Resistant Protective Coating (375F Catalytic Cure)	BMS14-4, Type III
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G02222	Abrasive - Dry, Blasting	BAC5748

D. Prepare the Surface

SUBTASK 51-21-12-120-004

- (1) Dry abrasive blast the damaged area to bare, clean metal with a clean (preferable new) 80, 100, or 120 grit aluminum oxide abrasive, G02222.
 - (a) Blow the area with clean dry air to remove the remaining abrasive material.
 - (b) Do not touch the clean parts with your bare hands because you can contaminate the surface.
 - (c) Put covers on the parts that were abrasive blasted until the parts are coated with coating, C00250 or coating, C00939.

NOTE: The BMS14-4 Type I must be applied in less than four hours after the dry abrasive blast.

SUBTASK 51-21-12-120-005

- (2) Use abrasive cloth, B00102 or abrasive mat, G00251 to abrade (sand) the area to feather the edges of the damaged coating.
 - (a) Also this is to scuff an area approximately 1/2 inch in width around the edge of the bare metal.

SUBTASK 51-21-12-100-003

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. PUT ON A RESPIRATOR, PROTECTIVE SPLASH GOGGLES, AND GLOVES WHEN YOU USE SOLVENTS. KEEP THE SOLVENTS AWAY FROM SPARKS, FLAME, AND HEAT. SOLVENTS ARE POISONOUS AND FLAMMABLE. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (3) Clean the surface with Series 84 solvent, B01004 (TASK 20-30-84-910-801).

E. Apply the coating, BMS14-4, Type III

NOTE: Use continuously stirred spray painting equipment which is free from organic contaminants. Coat the parts with the BMS14-4, Type III material until a equal, smooth, wet coating is obtained.

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SUBTASK 51-21-12-390-003

- (1) Apply the uncatalyzed coating, C00939 with a spray paint spray gun with interchangeable nozzles, STD-1133 or a paint brush, STD-1080.
 - (a) Apply the coating to the surface with one of the steps that follow:
 - 1) Apply the coating with a single pass of the spray gun.
 - 2) Apply two or three thin coats in 1 to 5 minutes of each other, at right angles to each other.

NOTE: This is necessary to prevent cracks or sags, and to keep the orange peel to a minimum.
 - (b) The coating may be applied to the areas of the part that are not easy to spray paint with the items listed below followed immediately by spray coating the remaining areas of the part with the spray gun.
 - 1) stencil gun
 - 2) airbrush
 - 3) hand brush.
 - (c) Do not apply too much of the coating, C00939 because it will cause, runs, beads, drips, or curtains.
 - 1) The conditions above can cause blistering, pitting, flaking, glazing, or heavy green discoloration during curing.
 - (d) Make sure the coating is not too dry when it is applied because it will produce a rough or sandy texture.
 - 1) These rough areas are porous and can cause decreased corrosion protection and a decrease in the coating bond.
 - (e) Dry the parts coated with coating, C00939 for at least 15 minutes at ambient temperature.
 - 1) The coating must be smooth and not have any fish eyes.
 - 2) The coating must have a smooth grey color after it is dry.
 - 3) Cure the coating for 1 hour at $375 \pm 25^{\circ}\text{F}$.
 - 4) You must see no lumps or runs in the cured coating.
 - 5) The total coating must be 0.0015 to 0.0035 inches thick.

NOTE: When is not at this specified thickness, you must apply more coats of the BMS14-4 Type III to get the specified thickness.
 - (f) Apply one coat of coating, C00939 catalyst to the coated area.
 - (g) Dry the parts coated with coating, C00939 for at least 15 minutes at ambient temperature.
 - 1) The coating must be smooth and not have any fish eyes.
 - 2) The coating must have a smooth grey color after it is dry.
 - 3) Let the catalyst cure for a minimum of 1 hour at $375 \pm 25^{\circ}\text{F}$.

NOTE: Do not pre-mix the coating with the catalyst, and do not let the catalyst touch the adjacent surfaces.
 - (h) To apply the specified overcoat systems, do this task: Decorative Exterior Paint System Application, TASK 51-21-99-300-801.

————— **END OF TASK** —————

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PREPAINT CLEANING AND TREATMENT - CLEANING/PAINTING

1. General

A. This procedure has these tasks:

- (1) Clean the Surface to be Painted
- (2) Prepare the Surface to be Painted
- (3) Cleaning and Preparation of Internal and External Plastic Surfaces.

B. The surface preparations in this document have different preparation procedures, and cleaning materials for the different types of surface materials.

C. All airplane surfaces must be cleaned and correctly prepared before you apply the paint.

D. The initial abrade (sanding) of laminates that are not covered with Tedlar is to provide a slight roughening of the surface.

NOTE: Do not abrade (sand) the laminate to make the surface smooth; but, apply a surface primer before you paint and then do the sanding.

- (1) The rough surface is to provide for a better bonding of the paint.

TASK 51-21-21-100-801

2. Clean the Surface to be Painted

A. References

Reference	Title
51-21-11-150-801	Paint Stripping (P/B 701)
51-31-00-160-801	Prepare For Sealing (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1080	Brush - Paint

C. Consumable Materials

Reference	Description	Specification
B00074	Solvent - Degreasing	MIL-PRF-680 (Supersedes P-D-680)
B00083	Solvent - Aliphatic Naphtha (For Acrylic Plastics)	TT-N-95 Type II, ASTM D-3735 Type III
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00116	Sponge - Synthetic	

D. Clean the Surface

SUBTASK 51-21-21-110-001

- (1) Do the steps that follow to clean the surface:

NOTE: Use solvent, B00083 or solvent, B00074 for this step.

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WARNING: DO NOT GET ALIPHATIC NAPHTHA OR DRY CLEANING SOLVENT IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE ALIPHATIC NAPHTHA OR DRY CLEANING SOLVENT. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE ALIPHATIC NAPHTHA OR DRY CLEANING SOLVENT. KEEP ALIPHATIC NAPHTHA OR DRY CLEANING SOLVENT AWAY FROM SPARKS, FLAME, AND TEMPERATURES ABOVE THE FLASHPOINT. ALIPHATIC NAPHTHA OR DRY CLEANING SOLVENT IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Remove the loose dirt, grease, and oil with cotton wiper, G00034 that is moist with solvent, B00074 or solvent, B00083.

NOTE: Be careful not to put solvent on an area that is larger than is necessary.

- (b) Clean the surface with a cotton wiper, G00034, soft paint brush, STD-1080, or a sponge, G00116 that is moist with solvent, B00074 or solvent, B00083.

NOTE: You can use a spray gun to help clean the surface.

- (c) Flush the surface with clean solvent, B00074 or solvent, B00083.
- 1) Rub the surface with a clean cotton wiper, G00034 to remove all of the dirt.
- (d) Remove all unwanted solvent.
- (e) Let the surface dry.

SUBTASK 51-21-21-110-002

- (2) Do the steps that follow to clean the area again:

WARNING: DO NOT GET ALIPHATIC NAPHTHA IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE ALIPHATIC NAPHTHA. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE ALIPHATIC NAPHTHA. KEEP ALIPHATIC NAPHTHA AWAY FROM SPARKS, FLAME, AND TEMPERATURES ABOVE THE FLASHPOINT. ALIPHATIC NAPHTHA IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY PERSONS AND DAMAGE TO EQUIPMENT.

CAUTION: YOU MUST FULLY CLEAN THE SURFACE BEFORE YOU APPLY PAINTS OR ADHESIVES. USE ALIPHATIC NAPHTHA IN THE LAST STEP OF THE PROCEDURE TO CLEAN THE SURFACE. DO NOT USE P-D-680 TYPE I FOR THE LAST STEP OF THE PROCEDURE TO CLEAN THE SURFACE. DAMAGE TO THE SURFACE CAN OCCUR IF P-D-680 TYPE I IS USED IN THE LAST STEP.

- (a) Use a spray bottle to apply the Aliphatic Naphtha solvent, B00083 to the surface.
- (b) Clean the surface with a clean cotton wiper, G00034 until all large pieces of dirt are removed.

NOTE: Use a soft bristle brush to clean if it is necessary.

- (c) Clean the surface again until no signs of the dirt are found on a clean cotton wiper, G00034.
- (d) Dry the area with a clean dry cotton wiper, G00034.

NOTE: Do not let drops of solvent dry on the surface.

E. Removal of the Temporary Finishes

SUBTASK 51-21-21-150-001

- (1) Remove the applicable temporary finishes if it is necessary, do this task: Paint Stripping, TASK 51-21-11-150-801.

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SUBTASK 51-21-21-390-001

(2) Repair all damaged sealant, do this task: Prepare For Sealing, TASK 51-31-00-160-801.

————— **END OF TASK** —————

TASK 51-21-21-370-801

3. Prepare the Surface to be Painted

A. References

Reference	Title
20-30-84-910-801	Final Cleaning of Metal Prior to Painting (Series 84) (P/B 201)
20-30-85-910-801	Final Cleaning of All Organic Coatings Prior to Painting (Series 85) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1080	Brush - Paint

C. Consumable Materials

Reference	Description	Specification
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B00314	Compound - Aircraft Surface Cleaning	MIL-C-43616
B00402	Cleaner - Aerospace Equipment	MIL-PRF-87937
B00635	Solvent - Cleaning Compound, Mixtures	A-A-59281
B01004	Solvent - Final Cleaning Of Metal Prior To Painting (AMM 20-30-84/201) - Series 84	
B01005	Solvent - Final Cleaning Of All Organic Coatings Prior To Painting (AMM 20-30-85/201) - Series 85	
C00175	Primer - Urethane Compatible, Corrosion Resistant (Less Than 1% Aromatic Amines)	BMS10-79, Type III
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I
C00260	Coating - Chemical And Solvent Resistant Finish, Epoxy Resin Enamel	BMS10-11, Type II
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20, Type II
C00319	Primer - Urethane Compatible, Corrosion Resistant	BMS10-79, Type II
C00346	Primer - Corrosion Inhibiting, Chemical & Solvent Resistant Epoxy, High Solids	MIL-PRF-23377
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00116	Sponge - Synthetic	

D. Prepare the Surface to be Painted

SUBTASK 51-21-21-110-003

(1) Prepare the metal surfaces to be painted as follows:

(a) The recommended procedure to prepare the metals surfaces listed below is to solvent clean:

1) Aluminum - Anodized or chemical treated

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- 2) Aluminum (metal sprayed) - chemical treated
- 3) Magnesium - Dow treated
- 4) Titanium - Phosphate fluoride treated
- 5) Steel (except CRES) - plated or phosphated

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- a) Solvent clean with Series 84 solvent, B01004 (TASK 20-30-84-910-801).
- (b) Use this optional procedure to prepare the metal surfaces below:
 - 1) Titanium
 - 2) Corrosion resistant Steel (CRES)
 - 3) Copper
 - 4) Nickel and Cobalt Alloys
 - a) Abrasive blast clean the metal with an approved abrasive for the type of material.

SUBTASK 51-21-21-110-004

(2) Prepare the materials listed below for painting by solvent clean:

- (a) Adhesive (except adhesive primers and adhesives flashes)
- (b) Sealant - Cured to its full hardness

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- 1) Solvent clean with Series 85 solvent, B01005 (TASK 20-30-85-910-801).
 - a) solvent, B00184

SUBTASK 51-21-21-100-002

(3) Epoxy Coatings listed below that have dried for less than 48 hours, do the procedures 1 or 2:

- (a) primer, C00259
- (b) coating, C00260
- (c) coating, C00307
- (d) primer, C00346
- (e) primer, C00319
- (f) primer, C00175
- (g) Do the Procedure 1 as follows:
 - 1) Manual solvent clean the surface.
 - 2) Use abrasive cloth, B00102, 240 grit or finer, to abrade (sand) the surface when it is necessary.

NOTE: Make sure you do not cause the substrate to show.

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WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- 3) Manually solvent clean the surface with Series 85 solvent, B01005 (TASK 20-30-85-910-801).

(h) Do the Procedure 2 as follows:

NOTE: Use the cleaners compound, B00314 or cleaner, B00402. Dilute the cleaners to 1 part cleaner to 10 parts of water by volume.

- 1) Clean the surface with cotton wiper, G00034, soft paint brush, STD-1080, or a sponge sponge, G00116 that is moist with cleaners compound, B00314 or cleaner, B00402.

NOTE: Do not clean too large an area at one time.

- 2) Let the cleaner soak for approximately 5 minutes.

NOTE: Do not let the cleaner dry on the surface because it can cause the surface to be stained.

- 3) Flush the area thoroughly with clean warm water (120°F maximum).

- a) Apply the water by pressure spray if it is available.
- b) Flush the area to remove cleaner residue.

- 4) Make sure all of the cleaner is removed.

- 5) Reclean the area if it is necessary to make sure all of the dirt has been removed.

- a) Pressure clean with a non-atomizing spray gun.

NOTE: You must use a minimum impingement time of 5 seconds, with a maximum stand time of 15 minutes.

NOTE: Do not let the cleaner dry on the surface.

- 6) Flush the surface thoroughly with clean water (hot water preferred) to remove all of the cleaner residues.

NOTE: Pressure spray or an air-water rinse is recommended.

- a) Make sure that all of the cleaner has been removed with a check of the run-off with pH paper.

NOTE: The pH must be the same as tap water.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- 7) Manual solvent clean the surface with Series 85 solvent, B01005 (TASK 20-30-85-910-801).

- 8) Less than 48 hours after you have cleaned the surface with alkaline cleaners, clean the surface with one of the steps that follow:

NOTE: Use a 1 to 1 solution of De Soto Oxsolv and water (or an applicable equivalent).

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- a) Manually clean the surface.
- b) Pressure clean the surface with a non-atomizing spray gun.

NOTE: You must use a minimum impingement time of 5 seconds, with a maximum stand time of 2 minutes.

NOTE: Do not let the cleaner dry on the surface.

- 9) Use cotton wiper, G00034 to remove wet solvent.
- 10) Solvent clean with PR-148 (clear) Adhesion Promoter solvent, B00635 with one of the steps that follow:

- a) Manually clean the surface.
- b) Pressure clean the surface with a non-atomizing spray gun.

NOTE: You must use a minimum impingement time of 5 seconds, with a maximum stand time of 2 minutes.

- 11) Blow dry the surface with filtered compressed air.

- (i) Do the Procedure 3 as follows:

- 1) Clean the surface.

NOTE: Abrasive pads (Scotch-brite) are recommended as an aid to remove stubborn dirt.

- a) Flush the surface with water until you get a water break-free surface.

NOTE: A water break-free surface will let a continuous layer of water stay on the surface for 30 seconds.

- b) Make sure you flush all unwanted material from the joints and fasteners.

- 2) Thoroughly flush the surface with clean water to remove all remaining sanded and cleaner material.

NOTE: If you do not get a water-break-free surface, clean the surface again.

- 3) If the substrate shows, use the applicable specifications to apply a new surface layer.
- 4) Thoroughly dry the surface before it is painted.

SUBTASK 51-21-21-100-004

- (4) Prepare all adhesive primers with one of the three procedures that follow:.

- (a) Do the Procedure 1.

- 1) Manually solvent clean the surface.
- 2) Abrasive clean with 320 grit or finer aluminum oxide abrasive cloth, B00102.

NOTE: Make sure you do not cause the substrate to show.

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- 3) Manual solvent clean the surface with Series 85 solvent, B01005 (TASK 20-30-85-910-801).

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(b) Do the Procedure 2 as follows:

NOTE: Use the cleaners MIL-C-43616 or cleaner, B00402. Dilute the cleaners with 1 part cleaner and 10 parts of water by volume.

- 1) Clean the surface with a cotton wiper, G00034, soft paint brush, STD-1080, or a sponge, G00116 that is moist with cleaner compound, B00314 or cleaner, B00402.

NOTE: Do not clean too large an area at one time.

- 2) Let the cleaner soak for approximately 5 minutes.

NOTE: Do not let the cleaner dry on the surface because it can cause the surface to be stained.

- 3) Flush the area thoroughly with clean warm water (120°F maximum).

a) Apply the water by pressure spray if it is applicable.

b) Flush the area a minimum of 3 times.

- 4) Make sure all of the cleaner is removed.

- 5) Reclean the area if it is necessary to make sure all of the dirt has been removed.

a) Pressure clean with a non-atomizing spray gun.

NOTE: You must use a minimum impingement time of 5 seconds, with a maximum stand time of 15 minutes.

NOTE: Do not let the cleaner dry on the surface.

- 6) Flush the surface thoroughly with clean water (hot water preferred) to remove all of the cleaner residues.

NOTE: Pressure spray or an air-water rinse is recommended.

a) Make sure that all of the cleaner has been removed with a check of the run-off with pH paper.

NOTE: The pH must be the same as tap water.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- 7) Solvent clean the surface with Series 85 solvent, B01005 (TASK 20-30-85-910-801).

NOTE: Blue stains from the leak detection paint do not have to be totally removed.

- 8) Less than 48 hours after you cleaned the surface with alkaline cleaners, clean the surface with one of the procedures that follow:

NOTE: Use a 1 to 1 solution of De Soto Oxsolv and water (or an applicable equivalent).

a) Manually clean the surface.

b) Pressure clean the surface with a non-atomizing spray gun.

NOTE: You must use a minimum impingement time of 5 seconds, with a maximum stand time of 2 minutes.

NOTE: Do not let the cleaner dry on the surface.

- 9) Use cotton wiper, G00034 to remove wet solvent.

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- 10) Solvent clean with PR-148 (clear) Adhesion Promoter solvent, B00635 with one of the steps that follow:
 - a) Manual clean the surface.
 - b) Pressure clean the surface with a non-atomizing spray gun.
- 11) Blow dry the surface with filtered compressed air.
- (c) Do the Procedure 3 as follows:
 - 1) Clean the surface.

NOTE: Abrasive pads (Scotch-brite) are recommended as an aid to remove stubborn dirt.
 - 2) Clean the surface with abrasive cloth, B00102 that are moist with cleaner compound, B00314 or cleaner, B00402 to make the surface rough.

NOTE: Dilute the cleaners with 1 part cleaner with 10 parts of water by volume.

 - a) Flush the surface with water until you get a water break-free surface.

NOTE: A water break-free surface will let a continuous layer of water stay on the surface for 30 seconds.
 - b) Make sure you flush all unwanted material from the joints and fasteners.
 - 3) Thoroughly flush the surface with clean water to remove all remaining sanding and cleaner material.

NOTE: If you do not get a water-break-free surface, clean the surface again.
 - 4) If the substrate shows, use the applicable specification to apply a new surface layer.
 - 5) Thoroughly dry the surface before it is painted.

SUBTASK 51-21-21-100-005

- (5) Prepare the adhesive flashes with one of the two procedures that follow.
 - (a) Do the Procedure 1 as follows:

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- 1) Solvent clean the surface with Series 85 solvent, B01005 (TASK 20-30-85-910-801).
- 2) Less than 48 hours after you cleaned the surface with alkaline cleaners, clean the surface with one of the procedures that follow:

NOTE: Use a 1 to 1 solution of De Soto Oxsolv and water (or an applicable equivalent).

- a) Manually clean the surface.
- b) Pressure clean the surface with a non-atomizing spray gun.

NOTE: You must use a minimum impingement time of 5 seconds, with a maximum stand time of 2 minutes.

NOTE: Do not let the cleaner dry on the surface.

- 3) Use cotton wiper, G00034 to remove wet solvent.

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- 4) Solvent clean with PR-148 (clear) Adhesion Promoter solvent, B00635 with one of the steps that follow:
a) Manual clean the surface.
b) Pressure clean the surface with a non-atomizing spray gun.
5) Blow dry the surface with filtered compressed air.
(b) Do the Procedure 2 as follows:
1) Abrade (sand) the surface with 240 grit or finer abrasive cloth, B00102.

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- 2) Manual solvent clean the surface with Series 85 solvent, B01005 (TASK 20-30-85-910-801).

END OF TASK

TASK 51-21-21-100-802

4. Cleaning and Preparation of Internal and External Plastic Surfaces

A. References

Table with 2 columns: Reference, Title. Rows include 20-30-87-910-801 (Final Cleaning of Composites Prior to Painting) and 51-21-99-300-801 (Decorative Exterior Paint System Application).

B. Consumable Materials

Table with 3 columns: Reference, Description, Specification. Rows include A00028 (Adhesive - Modified Epoxy), B00062 (Solvent - Acetone), B00102 (Abrasive - Aluminum Oxide Coated Cloth), B00148 (Solvent - Methyl Ethyl Ketone), B00184 (Solvent - Presealing), B01007 (Solvent - Final Cleaning), and G00034 (Cotton Wiper).

C. Cleaning and Preparation of External Plastic Surfaces

SUBTASK 51-21-21-100-007

- (1) Prepare the Carbon Epoxy and Fiberglass/Epoxy surfaces for paint.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (a) Clean the surface with a clean Series 87 solvent, B01007 (TASK 20-30-87-910-801).

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- (b) Abrade (sand) the surface with one of the steps that follow:

CAUTION: USING COARSE GRIT ABRASIVES CAN CAUSE DAMAGE TO THE SUBSTRATE FIBERS IF THE GRIT COMES IN CONTACT WITH THE RESIN COATING OF THE COMPOSITE SUBSTRATE. TO REDUCE THE POSSIBILITY OF DAMAGE TO THE COMPOSITE SUBSTRATE, ONCE THE TOPCOAT HAS BEEN REMOVED, USE PROGRESSIVELY FINER GRITS TO OBTAIN THE REQUIRED SURFACE FINISH.

- 1) Manually abrade (sand) the surface with 150 grit or finer abrasive cloth, B00102.

NOTE: It is optional to use coarse grit abrasives for expedient cleaning and material removal to the first paint topcoat layer.

- 2) Abrade (sand) the surface with an air-driven orbital sander with 150 grit or finer abrasive cloth, B00102.

NOTE: It is optional to use coarse grit abrasives for expedient cleaning and material removal to the first paint topcoat layer.

- (c) Remove the sanding residue with one of the steps that follow:

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- 1) Clean the surface with a clean cotton wiper, G00034 that is moist with Series 87 solvent, B01007 (TASK 20-30-87-910-801).

a) Use compressed air to help remove the remaining loose material before the final cleaning.

- 2) Clean the surface again if it is necessary.

- 3) Dry the surface with a clean cotton wiper, G00034 before the solvent becomes dry.

- (d) Examine the surface to determine if a pin hole filler or surfacer is necessary.

- (e) Apply the Static Conditioner Filler 28-C-1 (or an applicable equivalent) to fill the pinholes if it is necessary.

NOTE: You must use Static Conditioner Filler 28-C-1 (or an applicable equivalent) only to fill the pinholes. Do not apply a continuous layer of pinhole filler because it will cause an unsatisfactory paint bond.

- (f) If it is necessary, apply Primer-Surfacer 825X466 (or an applicable equivalent) or Surfacer adhesive, A00028 to fill:

NOTE: The surfacers are to be used only in the area of the pits in the surface or depressions. The surfacers are usually not used on the full part.

- 1) pits in the surface,

- 2) areas with resin missing, and

- 3) other minor depressions that cannot be filled with the pinhole fillers.

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WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (g) Do the final cleaning of the surface with a clean cotton wiper, G00034 that is moist with Series 87 solvent, B01007 (TASK 20-30-87-910-801).
 - 1) Fully dry the surface with a clean cotton wiper, G00034 before the solvent becomes dry.
- (h) Do this task: Decorative Exterior Paint System Application, TASK 51-21-99-300-801.

NOTE: Do this before a maximum time of 24 hours.

D. Cleaning and Preparation of Internal Plastic Surfaces

SUBTASK 51-21-21-100-008

- (1) Solvent clean the internal plastic surfaces.
 - (a) Clean the surface with a clean cotton wiper, G00034 that is moist with solvent, B00148, solvent, B00062, or alcohol.
 - 1) Clean BMS8-317 surfaces with presealing cleaning solvent, B00184.

SUBTASK 51-21-21-370-002

- (2) Prepare the internal decorative surfaces for paint.
 - (a) Manually abrade (sand) the internal decorative surfaces with 150 grit or finer abrasive cloth, B00102.
 - (b) Remove the sanding residue with the step that follows:
 - 1) Clean the surface with a clean cotton wiper, G00034 that is moist with solvent, B00148, solvent, B00062, or alcohol.
 - (c) Examine the surface to determine if a surfacer is necessary.
 - (d) Apply the Static Conditioner Filler 28-C-1 (or an applicable equivalent) to fill the pinholes if it is necessary.

NOTE: You must use Static Conditioner Filler 28-C-1 (or an applicable equivalent) only to fill the pinholes. Do not apply a continuous layer of pinhole filler because it will cause an unsatisfactory paint bond.
 - (e) If it is necessary, apply Primer-Surfacer 825X466 (or an applicable equivalent) or Surfacer adhesive, A00028 to fill:

NOTE: The surfacers are to be used only in the area of the pits in the surface or depressions. Usually, surfacers are not used on the full part.

- 1) pits in the surface,
 - 2) areas with resin missing, and
 - 3) other minor depressions that cannot be filled with the pinhole fillers.
 - (f) Do the final cleaning of the surface with a clean cotton wiper, G00034 that is moist with solvent, B00148, solvent, B00062, or alcohol.
 - (g) Fully dry the surface with a clean cotton wiper, G00034 before the cleaner becomes dry.

SUBTASK 51-21-21-370-003

- (3) Prepare the internal non-decorative surfaces for paint.
 - (a) Manually abrade (sand) the internal non-decorative surfaces with 150 grit or finer abrasive cloth, B00102.
 - (b) Remove the sanding residue with the step that follows:

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- 1) Clean the surface with a clean cotton wiper, G00034 that is moist with solvent, B00148, solvent, B00062, or alcohol.
- (c) Examine the surface to determine if a surfacer is necessary.
- (d) Apply the Static Conditioner Filler 28-C-1 (or an applicable equivalent) to fill the pinholes if it is necessary.

NOTE: You must use Static Conditioner Filler 28-C-1 (or an applicable equivalent) only to fill the pinholes. Do not apply a continuous layer of pinhole filler because it will cause an unsatisfactory paint bond.

- (e) If it is necessary, apply Primer-Surfacer 825X466 (or an applicable equivalent) or Surfacer adhesive, A00028 to fill:

NOTE: The surfacers are to be used only in the area of the pits in the surface or depression. Usually, surfacers are not used on the full part.

- 1) pits in the surface,
 - 2) areas with resin missing, and
 - 3) other minor depressions that cannot be filled with the pinhole fillers.
- (f) Do the final cleaning of the surface with a clean cotton wiper, G00034 that is moist with solvent, B00148.
 - (g) Fully dry the surface with a clean cotton wiper, G00034 before the cleaner becomes dry.

————— **END OF TASK** —————

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CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING

1. General

- A. This procedure contains these tasks:
 - (1) Corrosion Removal and Control for Aluminum and Aluminum Alloys
 - (2) Corrosion Removal and Control for Magnesium Alloys
 - (3) Corrosion Removal and Control for Carbon Steel
 - (4) Corrosion Removal and Control for Stainless Steel and Chromium Alloys
 - (5) Corrosion Removal and Control for Titanium Alloys
 - (6) Corrosion Removal and Control for Plated or Phosphated Surfaces
 - (7) Corrosion Removal and Control - After Mercury Spillage
- B. Graphite panels installed on graphite panels or on graphite structural components must use CRES or titanium fasteners. Using aluminum fasteners in graphite or hybrid aramid/graphite structures may result in corrosion.
- C. Carefully examine all structural parts where corrosion can occur.
- D. Complete removal of corrosion is important. If it is allowed to remain, corrosion will continue. Repair corroded parts when you find them if it is possible. Replace the corroded parts if it is necessary. For limits of corrosion removal, refer to the Structural Repair Manual.
- E. Corrosion can be removed by mechanical or chemical procedures. The specific procedure changes with the type and amount of corrosion. In most cases of corrosion damage, mechanical procedures are recommended.
- F. Corrosion removal and control procedures are applicable to all areas. Use these procedures only for small quantities of corrosion. To remove large quantities of corrosion, refer to the Structural Repair Manual.
- G. Make the regular inspection to prevent or find the start of corrosion. Missing fasteners, white powdery, or other corrosion deposits are signs of corrosion. Initiate the corrosion prevention practices to decrease the occurrence of corrosion.
- H. Following cleaning of suspected areas, a visual inspection using bright lighting and mirror is effective for finding corrosion.
- I. Periodic inspection is required in areas identified as susceptible to corrosion and should be consistent to the schedules specified in the Maintenance Planning Document. Operators must be aware of reported problems and areas of occurrences.
- J. If you cannot immediately remove corrosion from an area, prepare the area with corrosion inhibiting compound, G00009 or compound, C00915, (TASK 51-21-91-620-802). The corrosion inhibiting compound, G00009 or compound, C00915 is used to inhibit corrosion.
- K. Remove oil, grease, dirt, and paint from the surface or the part before corrosion removal.
- L. Remove any nearby fasteners before removing corrosion.

TASK 51-21-31-350-801

2. Removal and Control of Corrosion for Aluminum and Aluminum Alloys

(Table 701, Table 702)

A. References

Reference	Title
51-21-41 P/B 701	ALODINE COATING - CLEANING/PAINTING
51-21-91-620-801	Surface Preparation for Corrosion Inhibiting Compound (P/B 701)

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B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Table with 2 columns: Reference, Description. Rows include COM-2481 (Tool - Sealant Removal), COM-4746 (Handle - Sealant Removal Tool), and COM-4747 (Pneumatic Scraper Sharpener).

C. Consumable Materials

Table with 3 columns: Reference, Description, Specification. Rows include B00046 (Acid, Corrosion Removing), B00102 (Abrasive - Aluminum Oxide Coated Cloth), B00166 (Abrasive - pumice), E50003 (Compound - Corrosion Removal), G00116 (Sponge - Synthetic), G00251 (Abrasive - Mat, Non-Woven, Non-Metallic), G00268 (Brush - Soft Bristle, Paint), G00291 (Tape - Aluminum Foil, Scotch 425), G00834 (Cloth - Lint-free Cotton), G02414 (Brush - Stainless Steel), G50077 (Abrasive - Aluminum Oxide Paper, 240 grit or finer), G50138 (Cloth - Soft Cotton), G50256 (Water, Regular), G50260 (Sandpaper - Aluminum Oxide, 220 Grit), G50261 (Sandpaper - Aluminum Oxide, 400 Grit), G50262 (Wiper - Cleaning), G50590 (Metallic Wool - Aluminum).

D. Prepare For The Removal Of Corrosion

SUBTASK 51-21-31-160-002

- (1) Make sure that all areas that are prepared for corrosion inhibiting compounds are clean.

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- (2) Remove oil, grease, dirt, and paint from the surface or the part.
- (3) Make sure you remove all corrosion material from the surfaces or parts. Failure to remove all corrosion material can permit corrosion to start again. For limits of corrosion removal, refer to the Structural Repair Manual.
- (4) If you cannot immediately remove corrosion from an area, do this task: Surface Preparation for Corrosion Inhibiting Compound, TASK 51-21-91-620-801.

E. Procedure (Chemical)

SUBTASK 51-21-31-913-001

- (1) Do the steps that follow to prepare the airplane for chemical corrosion removal from the external surface of the airplane:
 - (a) If necessary, put the airplane in an area where you can fully flush all the surfaces with water, G50256 quickly.
 - (b) Apply Scotch 425 Aluminum Foil Tape, G00291 tape to hinges, mating surfaces, access doors and other openings that can allow the corrosion removing compound, E50003 to damage other metal types.
 - (c) Apply Scotch 425 Aluminum Foil Tape, G00291 to areas of magnesium, steel and cadmium plated parts.

NOTE: This will prevent the accidental corrosion of different metal types.

SUBTASK 51-21-31-150-001

- (2) Do the steps that follow to remove aluminum corrosion from the external surface of the airplane with corrosion removing compound, E50003:
 - (a) Apply corrosion removing compound, E50003 with any of the items that follow:
 - 1) Use a brush, G00268 to apply the compound.
 - 2) Use a sponge, G00116 to apply the compound.
 - 3) Use a lint-free cloth, G00834 to apply the compound.
 - (b) Apply the compound at the lowest area and work up into a circular movement.

NOTE: This will give a good layer and dwell time for the compound on the surface.

- (c) Let the compound to stay on the surface for approximately 12 minutes and do the step that follows:

NOTE: Compound applied warm (140°F (60°C) maximum temperature) on the surface gives better results.

- 1) Rinse with water, G50256.
- 2) Do again this procedure to remove more corrosion, if necessary.
- 3) Dry the treated surface and do the steps in ALODINE COATING - CLEANING/PAINTING, PAGEBLOCK 51-21-41/701.

SUBTASK 51-21-31-150-002

- (3) Do the steps that follow, to remove small quantities of aluminum corrosion from the external surface of the airplane with acid, B00046:

NOTE: This procedure is optional.

- (a) Fully flush the surface with water.

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WARNING: DO NOT ADD WATER TO ACID. ALWAYS ADD ACID TO WATER. ACID IS EXPLOSIVE WHEN WATER IS ADDED TO IT. IF YOU ADD WATER TO ACID, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (b) Add 1 part (by volume) of the corrosion remover, phosphoric acid, B00046 to 3 parts (by volume) of water, G50256.
- (c) Apply corrosion remover phosphoric acid, B00046 on the surface.
- (d) Fully flush all of the prepared area and the adjacent areas, with water, G50256.

NOTE: Make sure that you flush out all the phosphoric acid corrosion remover from the areas that follow: the skin seams, and all openings or holes on the surface.

- (e) Do again this procedure to remove more corrosion, if necessary.
- (f) Dry the treated surface and do the steps in ALODINE COATING - CLEANING/PAINTING, PAGEBLOCK 51-21-41/701.

F. Procedure (Mechanical Method)

SUBTASK 51-21-31-913-002

- (1) Do the steps that follow to prepare the airplane for mechanical corrosion removal from the external surface of the airplane:
 - (a) If necessary, put the airplane in an area where you can fully flush all the surfaces with water, G50256 quickly.
 - (b) Apply Scotch 425 Aluminum Foil Tape, G00291 tape to hinges, mating surfaces, access doors and other openings that can allow the corrosion by-products to damage other metal types.
 - (c) Apply Scotch 425 Aluminum Foil Tape, G00291 to areas of magnesium, steel and cadmium plated parts.

SUBTASK 51-21-31-160-003

- (2) Do any of the steps that follow to remove aluminum corrosion from the external surface of the airplane (Non-powered tools and materials):
 - (a) Use a abrasive mat, G00251 to rub away corrosion.
 - (b) Use a abrasive cloth, B00102 to rub away corrosion.
 - (c) Use a 240 grit or finer abrasive paper, G50077 to rub away corrosion.
 - (d) Use aluminum wool, G50590 to rub away corrosion.

NOTE: Metallic wools are available in five grades, ranging from very fine to extra coarse.

- (e) Use a brush, G02414 to brush away corrosion.

CAUTION: DO NOT USE ABRASIVE PADS (SCOTH-BRITE), OR ABRASIVE PAPER ON THE ALUMINUM SURFACE UNLESS THE SCRIBE LINE INSPECTIONS WERE MADE. ABRASIVE PADS CAN SMOOTH THE ALUMINUM SURFACE AND HIDE THE SCRIBE LINE MARKS. IF YOU USE ABRASIVE PADS TO REMOVE THE PAINT OR REQUIRED TO DO REPEAT INSPECTIONS BASED ON THE SCRIBE LINE INSPECTION SERVICE BULLETIN.

- 1) Remove the corrosion with a linear motion; do not crosshatch. This will unnecessarily damage the surface.
- 2) After wire brushing soft metal (such as aluminum or magnesium) the surface areas must be polished with a abrasive mat, G00251 or abrasive cloth, B00102.

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- (f) Use pumice abrasive, B00166 to brush away corrosion.
1) Mix with water, G50256 and rub over the area with a soft cotton cloth, G50138.
2) After drying, the pumice abrasive, B00166 powder is wiped off.

CAUTION: ONLY USE APPROVED SCRAPERS ON THE AIRPLANE SKIN. SCRAPERS THAT ARE NOT APPROVED CAN MAKE SCRATCHES ON THE SKIN, AND CAUSE FATIGUE CRACKS.

- (g) Scrapers are used primarily for the initial removal of heavy corrosion deposits in corners and crevices that cannot be reached with other equipment.
1) A sealant removal tool, COM-2481 and sealant tool removal handle, COM-4746 may be used on any metal surface.
a) If necessary, do these steps to sharpen the scraper:
< 1 > Sharpen the scraper with Sandpaper, G50260 or finer by hand or by metal sharpening wheel (scraper sharpener, COM-4747).
< 2 > If you sharpen the scraper by hand, rub the sharpened scraper on wiper, G50262 to remove loose sanding particles.
< 3 > If you use a metal sharpening wheel, rub the sharpened scraper on Sandpaper, G50261 or finer aluminum oxide paper to remove debris, and then rub it on wiper, G50262 to remove loose sanding particles.
2) Aluminum scrapers shall be used only on aluminum or magnesium surfaces.
3) Steel scrapers shall be used only on steel surfaces.

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- (3) After the removal of the corrosion, do the steps that follow:
(a) Rinse with water, G50256.
(b) Dry the treated surface and do the steps in ALODINE COATING - CLEANING/PAINTING, PAGEBLOCK 51-21-41/701.

END OF TASK

TASK 51-21-31-350-802

3. Removal and Control of Corrosion for Magnesium Alloys

(Table 701, Table 702)

A. References

Table with 2 columns: Reference, Title. Rows include 51-21-21-100-801 (Clean the Surface to be Painted), CPM 20-50-00 (Corrosion Prevention Manual), SRM 51-10-02 (Structural Repair Manual).

B. Tools/Equipment

Table with 2 columns: Reference, Description. Row includes STD-3911 (Brush - Bristle, Medium Nylon).

C. Consumable Materials

Table with 3 columns: Reference, Description, Specification. Rows include B00047 (Acid, Technical Grade, Nitric) and B00102 (Abrasive - Aluminum Oxide Coated Cloth).

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Reference	Description	Specification
B00137	Abrasive - Garnet Coated Paper	ANSI B74.18
B00166	Abrasive - pumice	
C00167	Acid, Chromic (Chromium Trioxide)	A-A-55827
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G02222	Abrasive - Dry, Blasting	BAC5748
G02414	Brush - Stainless Steel	

D. Procedure

SUBTASK 51-21-31-350-003

WARNING: SMALL PARTICLES AND FINE SHAVINGS OF MAGNESIUM START FIRES EASILY AND ARE EXTREMELY FLAMMABLE. MAGNESIUM DUST CAN CAUSE EXPLOSIONS. WATER IN CONTACT WITH BURNING MAGNESIUM IS A STEAM EXPLOSION HAZARD. EXTINGUISH FIRES WITH VERY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE BY APPLYING THE POWDER TO A DEPTH OF 1/2 INCH OR MORE OVER THE BURNING METAL. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, OR CARBON DIOXIDE TO EXTINGUISH FIRES OF MAGNESIUM. MAGNESIUM FIRES CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do these steps to mechanically remove magnesium alloy corrosion from the airplane:
 - (a) Make sure the metal is a magnesium alloy.
 - (b) During the removal process, protect the surrounding area from the corrosion dust.
 - (c) Remove any grease, oil, or paint from the area; do this task: Clean the Surface to be Painted, TASK 51-21-21-100-801.
 - (d) Measure the corroded area to find the amount of corrosion damage.

NOTE: Light corrosion will measure a maximum depth of 0.001 inch (0.025 mm).
Moderate corrosion will measure a maximum depth of 0.010 inch (0.254 mm).
Heavy corrosion will measure deeper than 0.010 inch (0.254 mm).

- (e) Remove loose corrosion with aluminum wool.
- (f) Remove the corrosion, based on the amount of damage:

CAUTION: DO NOT USE A CARBON STEEL BRUSH OR STEEL WOOL OR SILICONE CARBIDE ABRASIVE ON MAGNESIUM SURFACES. TINY DISSIMILAR METAL PARTICLES WILL CAUSE FURTHER CORROSION.

- 1) Remove light corrosion by hand sanding with an aluminum oxide abrasive cloth, B00102 or a garnet abrasive, B00137.
- 2) Remove light corrosion with pumice abrasive, B00166 paste.
 - a) Mix the pumice abrasive, B00166 with water to make the paste.
 - b) Use a clean cotton wiper, G00034 to apply and gently rub the pumice paste on the surface.
 - c) When the pumice abrasive, B00166 is a dry, white powder, wipe off with a clean, dry cotton wiper, G00034.
 - d) Remove the remaining corrosion with #600 grit abrasive cloth, B00102 and water.

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CAUTION: DO NOT USE EXCESSIVE RUBBING. HEAVY, CONTINUOUS RUBBING (SUCH AS WITH POWER-DRIVEN WIRE BRUSHES) CAN MAKE ENOUGH HEAT TO CAUSE CHANGES IN METALLIC PROPERTIES. CHANGES IN METALLIC PROPERTIES CAN CAUSE MORE CORROSION.

- 3) Use one of these steps to remove moderate and heavy corrosion :
- #400 grit abrasive cloth, B00102
 - Use a brush, G02414 with bristles no more than 0.003 inch (0.076 mm) diameter and no less than 1.0 inch (25.4 mm) long.

NOTE: After using the brush, polish the surface with #400 grit abrasive cloth, B00102 and then #600 grit abrasive cloth, B00102.

CAUTION: DO NOT USE TOO MUCH PRESSURE FOR ABRASIVE BLASTING. AIR PRESSURE FOR ABRASIVE BLASTING ON MAGNESIUM ALLOYS MUST BE 10 TO 35 PSI (69-241 KPA). TOO MUCH PRESSURE CAN CAUSE DAMAGE TO PARTS.

- Glass bead dry blasting abrasive, G02222 (170 to 400 grit).

WARNING: DO NOT GET CHROMIC ACID IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. PUT ON AN APRON, SPLASH GOGGLES, AND GLOVES WHEN YOU USE CHROMIC ACID. CHROMIC ACID CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

WARNING: DO NOT ADD WATER TO ACID. ALWAYS ADD ACID TO WATER. IF YOU ADD WATER TO ACID, YOU CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- After removing all corrosion that can be seen, apply a corrosion treating solution of chromium trioxide acid, C00167 or sodium dichromate with nitric acid, B00047, (SOPM 20-43-02).
- Rinse the part well with clean water.
- Smooth out repaired areas using Corrosion Damage and Rework Limits (SRM 51-10-02).
- Clean the repaired area.
- Measure the depth of the blends using Corrosion Damage and Rework Limits (SRM 51-10-02).
- Treat the repaired area using Standard Treatment Methods (CPM 20-50-00).

SUBTASK 51-21-31-350-004

- (2) Do the following steps to chemically remove the magnesium alloy corrosion from the external surface of the airplane:
- Make sure the metal is a magnesium alloy.
 - Remove any grease, oil, and loose paint from the area, do this task: Clean the Surface to be Painted, TASK 51-21-21-100-801.
 - Protect the areas surrounding the corroded area.

NOTE: Protect rubber parts, bearings, cast or pressed inserts, cracks, and plated steel.

WARNING: DO NOT GET CHROMIC ACID IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. PUT ON AN APRON, SPLASH GOGGLES, AND GLOVES WHEN YOU USE CHROMIC ACID. CHROMIC ACID CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

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WARNING: DO NOT ADD WATER TO ACID. ALWAYS ADD ACID TO WATER. IF YOU ADD WATER TO ACID, YOU CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(d) Prepare one of these chromic acid solutions according to manufacturer's directions, (SOPM 20-43-02):

- 1) Chromium trioxide acid, C00167, or
- 2) Sodium dichromate with nitric acid, B00047.

(e) Apply with acid resistant medium nylon bristle brush, STD-3911.

NOTE: Start from the lower surfaces and work upward to prevent runs and streaks. Apply with circular movement.

(f) Keep the solution on the surface for 15 minutes. Wipe dry.

NOTE: While the solution is on the surface, continue to brush over the surface again with a short fiber brush to prevent the solution from drying and streaking.

(g) Rinse with water while scrubbing with brush. Wipe dry.

NOTE: Repeat this sequence until the bright metallic color of the metal is shown.

(h) Smooth out repaired areas using Corrosion Damage and Rework Limits (SRM 51-10-02).

(i) Measure the depth of the repaired area using Corrosion Damage and Rework Limits (SRM 51-10-02).

(j) Treat the repaired area using Standard Treatment Methods (CPM 20-50-00).

————— **END OF TASK** —————

TASK 51-21-31-350-803

4. Removal and Control of Corrosion for Carbon Steel

(Table 701, Table 702)

A. References

Reference	Title
51-21-21-100-801	Clean the Surface to be Painted (P/B 701)
CPM 20-50-00	Corrosion Prevention Manual
SRM 51-10-02	Structural Repair Manual

B. Consumable Materials

Reference	Description	Specification
B00046	Acid, Corrosion Removing, Metal Conditioning, Phosphoric	MIL-C-10578
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
G02222	Abrasive - Dry, Blasting	BAC5748
G02414	Brush - Stainless Steel	

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C. Procedure

SUBTASK 51-21-31-350-005

- (1) Do these steps to mechanically remove corrosion from carbon steel parts of the airplane:

NOTE: When the heat-treat value of a part is unknown, repair the part as if it was heat-treated over 220,000 psi (1516847 kPa).

- (a) Make sure the metal is carbon steel and find its heat treat value.
- (b) During the removal process, protect the surrounding area from the corrosion dust.
- (c) Remove any grease, oil, and loose paint from the area; do this task: Clean the Surface to be Painted, TASK 51-21-21-100-801.

WARNING: YOU SHOULD BE VERY CAREFUL WHEN USING TOOLS ON HIGH STRENGTH STEEL SO THAT THE STEEL SURFACE DOES NOT GET TOO HOT. HOT STEEL CAN CAUSE INJURY TO PERSONS.

- (d) Remove corrosion by any of these methods:

NOTE: Hand-held power tools must not be used on high strength steels heat-treated to 220,000 psi (1516847 kPa) and above.

- 1) Use a brush, G02414 with bristles no larger than 0.010 inch (0.254 mm) in diameter,

NOTE: After using the brush, polish the surface with #400 grit abrasive cloth, B00102 and then #600 grit abrasive cloth, B00102.

- 2) Grinding with an abrasive wheel,

CAUTION: AIR PRESSURE MUST BE 40 TO 70 PSI (276-483 KPA) FOR ABRASIVE BLASTING ON CARBON STEEL HEAT-TREATED TO 220,000 PSI (1516847 KPA) AND ABOVE. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- 3) Glass bead dry blasting abrasive, G02222, or

- 4) Motor-driven wire brush.

- (e) Make sure all corrosion is removed.
- (f) Smooth out repaired areas using Corrosion Damage and Rework Limits (SRM 51-10-02).
- (g) Measure the depth of the repaired areas using Corrosion Damage and Rework Limits (SRM 51-10-02).
- (h) Treat the repaired area using Standard Treatment Methods (CPM 20-50-00).

SUBTASK 51-21-31-350-006

- (2) Do the following steps to chemically remove corrosion from carbon steel parts of the airplane:

NOTE: When the heat-treat value of a part is unknown, repair the part as if it was heat-treated over 220,000 psi (1516847 kPa).

NOTE: The use of acid can cause hydrogen embrittlement on steel parts heat-treated above 220,000 psi (1516847 kPa). The use of acid is not allowed on steel parts heat-treated above 220,000 psi (1516847 kPa).

- (a) Make sure the metal is carbon steel and find its heat treat value.
- (b) During the removal process, protect the surrounding area from the corrosion dust.
- (c) Remove any grease, oil, and loose paint from the area, do this task: Clean the Surface to be Painted, TASK 51-21-21-100-801.
- (d) Remove heavy rust by hand using a chipper or a brush, G02414.

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WARNING: DO NOT GET PHOSPHORIC ACID IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. WEAR AN APRON, GOGGLES, AND ACID RESISTANT GLOVES WHEN YOU USE PHOSPHORIC ACID. PHOSPHORIC ACID CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

WARNING: DO NOT ADD WATER TO ACID. ALWAYS ADD ACID TO WATER. IF YOU ADD WATER TO ACID, YOU CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(e) Use one of the following methods for chemical removal of corrosion:

- 1) Inhibited phosphoric acid, B00046 - (Brush-on Method)

NOTE: Acid type removers are used for removing rust or black oxide.

- 2) Inhibited phosphoric acid, B00046 - (Soak-in Method)

NOTE: Acid type removers are used for removing rust or black oxide.

NOTE: This method is used for removing heavy rust from parts removed from the airplane and where the corroded area can be put fully into the acid base.

WARNING: THE ALKALI RUST REMOVER IS HIGHLY ALKALINE AND HARMFUL TO SKIN AND EYES. WEAR RUBBER GLOVES, APRONS, AND GOGGLES WHEN WORKING WITH THIS MATERIAL. MAKE SURE THAT THE AREA WHERE YOU WILL USE THIS MATERIAL HAS GOOD AIRFLOW. THE ALKALI RUST REMOVER CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- 3) Alkali Type Rust Remover - (Soak-in Method)

NOTE: Alkali type removers are used for removing red rust.

- (f) If there is any remaining corrosion, do the rust removing method again.
- (g) Smooth out repaired areas using Corrosion Damage and Rework Limits (SRM 51-10-02).
- (h) Measure the depth of the repaired areas using Corrosion Damage and Rework Limits (SRM 51-10-02).
- (i) Treat the repaired area using Standard Treatment Methods (CPM 20-50-00).

————— **END OF TASK** —————

TASK 51-21-31-350-804

5. Removal and Control of Corrosion for Stainless Steel and Nickel-Chromium Alloys

(Table 701, Table 702)

A. Procedure

SUBTASK 51-21-31-350-007

CAUTION: ABRASIVE BLASTING OR GRINDING SHALL NOT BE USED ON THIN WALL TUBES OR THIN WEBS LESS THAN 0.0625 INCH (1.5875 MM) THICK. THESE METHODS CAN DAMAGE THE STRUCTURE.

- (1) Remove corrosion mechanically by using the same general procedures as for carbon steel; do this task: Removal and Control of Corrosion for Carbon Steel, TASK 51-21-31-350-803.

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SUBTASK 51-21-31-350-008

- (2) Remove corrosion chemically by using the same general procedures as for carbon steel; do this task: Removal and Control of Corrosion for Carbon Steel, TASK 51-21-31-350-803.

NOTE: Only use chemical removers on stainless steel and nickel-chromium alloys in very corroded areas and where the chemicals will not be trapped in cracks, lap joints, crevices, and other such areas.

————— END OF TASK —————

TASK 51-21-31-350-805

6. Removal and Control of Corrosion for Titanium Alloys

(Table 701, Table 702)

A. References

Reference	Title
51-21-21-100-801	Clean the Surface to be Painted (P/B 701)
CPM 20-50-00	Corrosion Prevention Manual

B. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

C. Procedure

SUBTASK 51-21-31-350-009

WARNING: SMALL CHIPS OR SLIVERS OF A TITANIUM ALLOY, CAUSED BY A MACHINING PROCESS ARE VERY FLAMMABLE. EXTINGUISH THESE FIRES WITH VERY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. DO NOT USE WATER, CARBON DIOXIDE, CARBON TETRACHLORIDE OR THE ORDINARY CHEMICAL FIRE EXTINGUISHER. TITANIUM FIRES CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Remove corrosion mechanically from a titanium alloy by these steps:
 - (a) Make sure the metal is a titanium alloy.
 - (b) Remove any grease, oil, or paint from the area, do this task: Clean the Surface to be Painted, TASK 51-21-21-100-801.
 - (c) Apply aluminum polish by hand with a cotton wiper, G00034. Do this until all corrosion is removed.
 - (d) Remove the polish with a clean cotton wiper, G00034.
 - (e) Treat repaired area using Standard Treatment Methods (CPM 20-50-00).

SUBTASK 51-21-31-350-010

- (2) Removal of corrosion by chemicals is not allowed on titanium alloys.

NOTE: Titanium can become brittle when exposed to acid solutions. Chemical removers are not allowed.

————— END OF TASK —————

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TASK 51-21-31-350-806

7. Removal and Control of Corrosion for Plated or Phosphated Surfaces

(Table 701, Table 702)

A. References

Reference	Title
51-21-21-100-801	Clean the Surface to be Painted (P/B 701)
CPM 20-50-00	Corrosion Prevention Manual

B. Consumable Materials

Reference	Description	Specification
B00046	Acid, Corrosion Removing, Metal Conditioning, Phosphoric	MIL-C-10578
C00167	Acid, Chromic (Chromium Trioxide)	A-A-55827
G02414	Brush - Stainless Steel	

C. Procedure

SUBTASK 51-21-31-350-011

(1) Remove corrosion from cadmium plated surfaces by the following steps:

- (a) During the removal process, protect the surrounding area from the corrosion dust and contamination.
- (b) Remove any grease, oil, or paint from the area, do this task: Clean the Surface to be Painted, TASK 51-21-21-100-801.
- (c) If corrosion is only on the plated surface, repair as follows (if corrosion has gone through the plated surface, refer to steps below):
 - 1) Rub gently with stainless steel wool.

NOTE: Removal work on plated surfaces should be kept to a minimum. This will make sure of the preservation of the adjacent plating.

WARNING: DO NOT GET CHROMIC ACID IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. PUT ON AN APRON, SPLASH GOGGLES, AND GLOVES WHEN YOU USE CHROMIC ACID. CHROMIC ACID CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

WARNING: DO NOT ADD WATER TO ACID. ALWAYS ADD ACID TO WATER. IF YOU ADD WATER TO ACID, YOU CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- 2) Apply the solution of chromic acid, C00167 and allow to stay on the corroded surface for 30 to 60 seconds.

NOTE: The solution strength shall be 4 ounces (.12 liter) of chromium trioxide to 1 U.S. gallon (3.8 liters) of water.

- 3) Rinse part with clean water and air dry.

(d) If corrosion has gone through the plated surface, repair as follows:

- 1) Decide if the part should be repaired or replaced.
- 2) If the part can be repaired, identify the base metal and remove corrosion according to the base metal's applicable procedure.

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(e) Treat repaired area using Standard Treatment Methods (CPM 20-50-00).

SUBTASK 51-21-31-350-012

(2) Remove corrosion from plated surfaces (that are NOT cadmium plated) by the following steps:

- (a) During the removal process, protect the surrounding area from the contaminants.
- (b) Remove any grease, oil, and loose paint from the area, do this task: Clean the Surface to be Painted, TASK 51-21-21-100-801.
- (c) Remove heavy rust by hand using a chipper or a brush, G02414 .

WARNING: DO NOT GET PHOSPHORIC ACID IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. PUT ON AN APRON, SPLASH GOGGLES, AND GLOVES WHEN YOU USE PHOSPHORIC ACID. PHOSPHORIC ACID CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

WARNING: DO NOT ADD WATER TO ACID. ALWAYS ADD ACID TO WATER. IF YOU ADD WATER TO ACID, YOU CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(d) Apply phosphoric acid, B00046 to corroded area.

NOTE: Allow the acid solution to stay on the corroded surface only long enough to remove the corrosion.

NOTE: Mix the acid on a 1:1 ratio.

(e) Rinse the part with clean water and air dry.

(f) Treat repaired area using Standard Treatment Methods (CPM 20-50-00).

SUBTASK 51-21-31-350-013

(3) To repair phosphated cadmium surfaces refer to the procedures for cadmium plated surfaces.

SUBTASK 51-21-31-350-014

(4) To repair phosphated ferrous alloy surfaces refer to the procedures for carbon steel.

Table 701/51-21-31-993-801 Abrasive Paper or Cloth Use for Corrosion Removal

Metals or Materials to be Processed	Restrictions	Operation	Abrasive Paper or Cloth		
			Aluminum Oxide	Silicon Carbide	Garnet
Ferrous Alloys Heat Treated 220 ksi or Higher	Do not use acid base rust removers. Do not use handheld power tools.	Corrosion Removal and Smooth-out	150-Finer	150-Finer	
		Finishing	400		
Ferrous Alloys	Does not apply to steel heat treated to strengths 220 ksi or higher	Corrosion Removal and Smooth-out	150-Finer	180-Finer	
		Finishing	400		
Aluminum Alloys Except Clad Aluminum	Do not use silicon carbide abrasive	Corrosion Removal and Smooth-out	150-Finer		7/0-Finer
		Finishing	400		

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Metals or Materials to be Processed	Restrictions	Operation	Abrasive Paper or Cloth		
			Aluminum Oxide	Silicon Carbide	Garnet
Clad Aluminum	Sanding limited to the removal of minor scratches	Corrosion Removal and Smooth-out	240-Finer		7/0-Finer
		Finishing	400		
Magnesium Alloys		Corrosion Removal and Smooth-out	240-Finer		
		Finishing	400		
Titanium		Cleaning and Finishing	150-Finer	180-Finer	
Plated or Phosphated Surfaces		Refer to the applicable base metal for removal method			

Table 702/51-21-31-993-802 More Abrasives and Abrasive Wheel Use for Corrosion Removal

Metals or Materials Processed to be Processed	Restrictions	Operation	Abrasive Fabric or Pad	Wool		Pumice 350 Mesh or Finer	Abrasive Wheel
				Aluminum	Stainless Steel		
Ferrous Alloys Heat Treated 220 ksi or Higher	Do not use acid base rust removers. Do not use handheld tools.	Corrosion Removal & Smooth-out	Fine to ultra-fine	X	X	X	
		Finishing		X	X	X	
Ferrous Alloys	Does not apply to steel heat treated to strengths 220 ksi or higher.	Corrosion Removal & Smooth-out	Fine to ultra-fine	X	X	X	X
		Finishing		X	X	X	
Aluminum Alloys Except Clad Aluminum	Do not use silicon carbide abrasive.	Corrosion Removal & Smooth-out	Very fine & ultra-fine	X		X	X
		Finishing		X		X	

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Metals or Materials Processed to be Processed	Restrictions	Operation	Abrasive Fabric or Pad	Wool		Pumice 350 Mesh or Finer	Abra- sive Wheel
				Alum- inum	Stain- less Steel		
Clad Aluminum	Sanding limited to the removal of minor scratches.	Corrosion Removal & Smooth-out	Very fine & ultra- fine			X	X
		Finishing				X	
Magnesium Alloys		Corrosion Removal & Smooth-out	Very fine & ultra- fine	X		X	
		Finishing		X		X	
Titanium		Cleaning and Finishing			X	X	X
Plated or Phosphated Surfaces		Refer to the applicable base metal for removal method.			X		

————— **END OF TASK** —————

TASK 51-21-31-350-807

8. Cleanup After Mercury Spillage

A. References

Reference	Title
05-51-14-210-801	Mercury Spillage Conditional Inspection (P/B 201)

B. Procedure

SUBTASK 51-21-31-160-001

- (1) For corrosion clean-up and control after mercury spills, do this task: Mercury Spillage Conditional Inspection, TASK 05-51-14-210-801.

————— **END OF TASK** —————

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ALODINE COATING - CLEANING/PAINTING

1. General

- A. This procedure contains three tasks:
 - (1) The first task is to apply Alodine 1000 solution.
 - (2) The second task is to apply Alodine 600, 1200 or 1200S solution.
 - (3) The third task is to apply Alodine 1132 Coating, C50079.
- B. Alodine is used for protection. It is a paint base. Alodine 600, 1000, 1200, and 1200S, solutions are used to give the chemical coating.
- C. In areas where Alodine may come in contact with BMS 10-20 primer only Alodine 600 should be used. BMS 10-20 is typically used on the fuel tank wing structure.
- D. When you use Alodine 600, 1000, 1200, 1200S and 1132 obey the precautions for chemicals that can cause corrosion. Wear respirators and rubber or neoprene gloves when you mix and apply Alodine solutions. Follow the necessary precautions and do not get Alodine solutions on your skin.
- E. Do not let the papers or cloths dry after you apply Alodine solutions. They can cause a fire when they are dry. After you use the cloths or paper, soak them in water before you discard them.
- F. Use Alodine 1132 Coating, C50079 for touch-up and rework of anodized, chemical conversion coated or painted parts and assemblies except those to be painted or previously painted with BMS10-20 fuel tank coating and those parts and assemblies to be sealed with BMS5-26 or BMS5-45 sealant.

TASK 51-21-41-370-801

2. Apply Alodine 1000 Solution

A. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
SRM 51-20-05	Structural Repair Manual

B. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle
STD-1104	Bottle - Polyethylene, Capacity 1 Pint, with Polyethylene Screw Cap and Seal
STD-1117	Container - Clear, Plastic or Glass, 1 Gallon (4 Liters)

C. Consumable Materials

Reference	Description	Specification
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00151	Solvent - Methyl Isobutyl Ketone	ASTM D1153
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88/201) - Series 88	
C00064	Coating - Aluminum Chemical Conversion	BAC5719, Type II, Class A (MIL-C-5541, Class A)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054

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Reference	Description	Specification
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)

D. Prepare the surface for coating.

NOTE: Use coating, C00064.

SUBTASK 51-21-41-950-001

- (1) Apply Scotch Flatback Masking Tape 250, G00270 to all adjacent areas. Do not let the Alodine solution fall on surfaces that have no tape.

NOTE: You do not have to apply tape on anodized surfaces.

SUBTASK 51-21-41-390-001

- (2) Seal all holes and clearances on assemblies that have honeycomb or foam plastic. Use the applicable sealing or caulking material or use rubber plugs to prevent entrance of the Alodine solution.

SUBTASK 51-21-41-140-001

- (3) Clean the surface with a liquid solvent grease remover. Use a clean soft bristle brush, STD-123 or cotton wiper, G00034. Dry the surface with warm air or rub it.

SUBTASK 51-21-41-140-002

- (4) Remove the organic, inorganic and hydraulic fluid resistant finishes from the repair area. Use the subsequent materials:

- (a) abrasive mat, G00251 or abrasive cloth, B00102

SUBTASK 51-21-41-140-003

- (5) Remove all the material (organic, inorganic) from the area until you get a clean and shiny aluminum surface.

SUBTASK 51-21-41-140-004

- (6) Clean the surface with a dry, clean cotton wiper, G00034 to remove all loose and remaining particles from the area.

SUBTASK 51-21-41-110-001

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (7) Rub the surface with a cotton wiper, G00034. Make the cotton wiper, G00034 moist (not soaked) with Series 88 solvent, B01008 (TASK 20-30-88-910-801) or with solvent, B00151. Clean the surface with a clean cotton wiper, G00034 until no remaining particles are found.

SUBTASK 51-21-41-910-001

- (8) Let the surface dry for a minimum of 15 minutes.

SUBTASK 51-21-41-100-001

- (9) Remove all corrosion material found on the surface.

SUBTASK 51-21-41-100-002

- (10) For information on the installation of sealant in the integral fuel tanks, (SRM 51-20-05).

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E. Prepare Coating Solution

NOTE: Use coating, C00064.

NOTE: In areas where the coating may come in contact with BMS 10-20 primer, only Alodine 600 should be used.

SUBTASK 51-21-41-370-001

WARNING: DO NOT GET ALODINE SOLUTION IN YOUR MOUTH, IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. AIR MUST FLOW FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL IS POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) To prepare the Alodine 1000 solution, do these steps:
 - (a) If you are using Alodine 1000L, do the steps that follow:
 - 1) Put 6 parts (by volume) of water in a clean 1 U.S.-gal (4 l) plastic or glass, clear container, STD-1117.
 - 2) Add 4 parts (by volume) of Alodine 1000L liquid concentrate to the water.
 - (b) If you are using Alodine 1000 powder, add 0.4 ounces (0.12 liter) of Alodine 1000 powder to water for each gallon (3.8 liters) of final solution.
 - (c) Fully mix the Alodine solution.
 - (d) Let the solution stay for an hour before it is used.
 - (e) Put the Alodine 1000 solution in clean polyethylene bottle (1 pint), STD-1104.
 - (f) Identify the bottles with a label. Write the date when the solution was mixed and the date when the pot life ends.

NOTE: The pot life of the Alodine 1000 solution is 14 days. Because the Alodine 1000 solution is sensitive to all types of contamination, make sure all containers are fully clean before they are used.

F. Procedure - Apply Alodine 1000 Solution

NOTE: In areas where the Alodine may come in contact with BMS 10-20 primer, only Alodine 600 should be used.

SUBTASK 51-21-41-370-002

WARNING: DO NOT GET ALODINE SOLUTION IN YOUR MOUTH, IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. AIR MUST FLOW FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL IS POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Apply Alodine 1000 solution with a clean cotton wiper, G00034.

NOTE: Keep the room temperature above 65°F (18.3°C).

SUBTASK 51-21-41-370-003

- (2) Keep the part wet with the Alodine 1000 solution for 3 to 5 minutes.

NOTE: Do not let the papers or cloths dry after you apply Alodine solutions. They can cause a fire when they are dry. After you use the cloths or paper soak them in water before you discard them.

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SUBTASK 51-21-41-170-001

(3) Flush the surface with water.

SUBTASK 51-21-41-910-002

CAUTION: DO NOT TOUCH THE PART UNTIL IT IS FULLY DRY. THE WET ALODINE SOLUTION IS EASILY DAMAGED.

(4) Air dry the surface.

NOTE: Dry at 120 degrees F (48.9 C) (optimum), 130 degrees F (54.4 C) (maximum).

————— **END OF TASK** —————

TASK 51-21-41-370-802

3. Apply Alodine 600, 1200 or 1200S Solution

A. Tools/Equipment

Reference	Description
STD-1052	Container - Acid Resistant
STD-1086	Gloves - Rubber
STD-1118	Container - Stainless Steel, 1 Gallon (4 Liters)
STD-3911	Brush - Bristle, Medium Nylon

B. Consumable Materials

Reference	Description	Specification
C00064	Coating - Aluminum Chemical Conversion	BAC5719, Type II, Class A (MIL-C-5541, Class A)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

C. Prepare Coating.

NOTE: Use coating, C00064.

NOTE: In areas where the Alodine may come in contact with BMS 10-20 primer, only Alodine 600 should be used.

SUBTASK 51-21-41-370-004

WARNING: DO NOT GET ALODINE SOLUTION IN YOUR MOUTH, IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. AIR MUST FLOW FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL IS POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Put Alodine 600, 1200 or 1200S on paper and use a roller to make the powder smooth.

SUBTASK 51-21-41-370-005

(2) Mix the solution in a stainless steel container (1 gal) (4 Liters), STD-1118 or acid resistant container, STD-1052.

NOTE: Do not use lead or glass.

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SUBTASK 51-21-41-370-006

- (3) For Alodine 600 or 1200, add 3 ounces (0.06 liter) of powder for each gallon (3.8 liters) of final solution.

SUBTASK 51-21-41-370-007

- (4) For Alodine 1200S, add 2 ounces (0.09 liter) of powder for each gallon (3.8 liters) of final solution.

SUBTASK 51-21-41-370-008

- (5) Fully mix the solution.

SUBTASK 51-21-41-910-003

- (6) Do not move the solution for a minimum of 1 hour.

NOTE: A dirty solution is unsatisfactory. Prepare the solution in small quantities and discard it when it is dirty. If water that is not distilled is used, add nitric acid to control the pH range from 1.50 to 2.00 for Alodine 1200 or 1200s. For Alodine 600 add 2 percent by volume of Alodine Toner 22 and stir to adjust the pH to between 1.5 and 2.0. Do a pH check. Use pHDrion paper #60781. Do not add wetting agents or other materials to this solution.

D. Procedure - Apply Alodine 600, 1200 or 1200S solution.

NOTE: In areas where the Alodine may come in contact with BMS 10-20 primer, only Alodine 600 should be used.

SUBTASK 51-21-41-370-009

WARNING: DO NOT GET ALODINE SOLUTION IN YOUR MOUTH, IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. AIR MUST FLOW FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL IS POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT. DO NOT LET THE CLOTHS YOU USE TO DRY. THESE CLOTHS, WHEN DRY, CAN CAUSE A FIRE.

- (1) Apply Alodine 600, 1200 or 1200S equally with a medium nylon bristle brush, STD-3911 or a clean cotton wiper, G00034. Start from the bottom.

SUBTASK 51-21-41-370-010

- (2) Let the solution stay on the surface until a given color is found. Keep the area wet. Apply small quantities of solution with a cotton wiper, G00034.

NOTE: Do not let the Alodine 600, 1200, or 1200S solution dry until the color of the surface changes.

SUBTASK 51-21-41-140-005

- (3) Carefully flush the surface with a clean cotton wiper, G00034 that is moist with water. Start from the bottom.

NOTE: Be careful when you rub or dry the surface. Do not remove the coating or cause scratches on the surface.

SUBTASK 51-21-41-140-006

- (4) Lightly rub the surface with a clean dry cotton wiper, G00034 to remove unwanted liquid. Rub the surface until the liquid is gone.

SUBTASK 51-21-41-100-003

- (5) Immediately after use, fully clean the cloths in water and keep them in a container filled with water.

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SUBTASK 51-21-41-910-004

(6) Air dry the surface.

NOTE: Dry at 120 degrees F (48.9 C) (optimum), 130 degrees F 54.4 C) (maximum).

SUBTASK 51-21-41-370-011

(7) Apply the last finish or start adhesive bonding (Chapter 51 of the Structural Repair Manual). Touch the parts or surface with clean rubber gloves, STD-1086 and keep the parts or surface dry and clean to prevent surface contamination.

END OF TASK

TASK 51-21-41-370-803

4. Apply Alodine 1132

A. Consumable Materials

Reference	Description	Specification
C50079	Coating - Chemical Conversion, Alodine 1132	

B. Procedure

SUBTASK 51-21-41-370-012

(1) Remove the cap of the Alodine 1132 Coating, C50079, and hold the pen with the applicator tip downwards.

SUBTASK 51-21-41-840-001

(2) Activate the pen by pressing the applicator tip against a firm surface. This will open the valve allowing the premixed solution to flow to the applicator tip. A new pen should take 30 to 45 seconds for the tip to be wet. When the tip is wet, release pressure. The pen is ready for use.

SUBTASK 51-21-41-200-001

(3) Ensure that surface to be coated is dry before proceeding.

SUBTASK 51-21-41-370-013

(4) Apply Alodine 1132 coating to the part surface in smooth even strokes. Fifty percent overlap of strokes usually gives proper coating weight. Do not allow the Alodine 1132 to puddle. Puddling will increase the time required for drying, and thick uneven areas in the coating cause performance failures.

SUBTASK 51-21-41-370-014

(5) Wait until coating dries and repeat the application in a cross hatch pattern. Do not water rinse. Water rinse degrades corrosion resistance and paint adhesion.

SUBTASK 51-21-41-370-015

(6) Ambient air dry or force air dry coating at 130 F maximum sufficiently to evaporate water.

END OF TASK

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MAGNESIUM - CLEANING/PAINTING

1. General

A. This procedure has one task:

- (1) Application of conversion coating to magnesium parts.

TASK 51-21-51-100-801

2. Airplane Surface Finish Application

WARNING: CLEANING AND CONVERSION COATING SOLUTIONS CONTAIN HAZARDOUS AND FLAMMABLE MATERIALS. THESE SOLUTIONS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

A. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle

B. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00116	Sponge - Synthetic	
G00744	Cloth - Emery	

C. Apply the Conversion Coating

SUBTASK 51-21-51-120-001

WARNING: MAGNESIUM POWDER CAN CAUSE A FIRE. INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Rub the surface with a emery cloth, G00744, #240 grit.

SUBTASK 51-21-51-100-001

(2) Clean the surface as follows:

- (a) Remove all loose particles from the surface with a soft-bristle soft bristle brush, STD-123 or rub the surface with clean cotton wiper, G00034

CAUTION: PROTECT ALL SURFACES THAT YOU DO NOT WANT TO CLEAN. CLEANER CAN CAUSE DAMAGE TO CADMIUM OR ALUMINUM FINISHES.

- (b) Apply protection to all areas that you do not want to clean.

NOTE: Use a material that will resist cleaning and conversion coating solutions.

- (c) To prepare the cleaning solution, mix 10 volumes of water to 1 volume of Kelite 28.

CAUTION: DO NOT LET THE CLEANING SOLUTION INTO FAYING SURFACES. DAMAGE TO THE FAYING SURFACES CAN OCCUR IF YOU PERMIT THE CLEANING SOLUTION TO STAY ON THE SURFACE.

- (d) Apply the cleaning solution to the surface using a cotton wiper, G00034, soft bristle brush, STD-123, or a sponge, G00116

NOTE: Let the solution soak for five minutes.

NOTE: Do not let the cleaner dry on the surface.

- (e) Thoroughly flush the surface with a clean wet sponge, G00116 or cotton wiper, G00034 to completely remove cleaner residue.

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- (f) Apply a thin film of water to part surface and inspect for a water break-free surface.

NOTE: A water break-free surface will have a continuous layer of water for 30 seconds.

- (g) Clean the surface with a mixture of magnesium oxide and water to remove the water break.
(h) Dry the surface with a clean cotton wiper, G00034.
(i) Flush the surface again with a clean wet cotton wiper, G00034 or sponge, G00116.

SUBTASK 51-21-51-110-001

- (3) Mix the Dow 19 conversion coating as follows:

- (a) In a clean 1 gallon (3.8 liters) glass or polyethylene container:
- 1) add 9/10 gallon (3.4 liters) water,
 - 2) add 1 1/3 ounce (0.04 liter) chromic acid,
 - 3) add 1 ounce (0.03 liter) calcium sulphate, and
 - 4) add water to fill the container to the 1 gallon (3.8 liter) level.
- (b) Mix the solution for a minimum of 15 minutes.

NOTE: Let the particles in the solution go to the bottom of the container.

NOTE: The solution must be free of all particles when it is applied.

- (c) Measure the 'pH' of the solution and check that it is between 1.2 and 1.6.
(d) If the 'pH' is not correct, do the following:
- 1) Use sulfuric acid to lower the 'pH'.
 - 2) Use sodium hydroxide to increase the 'pH'.

SUBTASK 51-21-51-110-002

- (4) Apply the conversion coating solution.

- (a) Apply a sufficient quantity of the solution to wet the metal surface until the surface is gold to dark brown in color.
(b) Flush the surface with clean cold water.
(c) Dry the surface with air that is no more than 180 degrees F (82.2 C).
(d) Make sure that all of the surface is coated.
(e) Make sure there are no scratches, powder or lines on the surface.
(f) If there is any scratches or powder on the surface do the following:
- 1) Rub the surface with a clean cotton wiper, G00034 and apply the conversion coating again.

SUBTASK 51-21-51-370-001

- (5) As soon as possible, apply the correct protective finish to prevent contamination of the surface or the start of corrosion.

————— **END OF TASK** —————

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HYDRAULIC-FLUID-RESISTANT FINISH - CLEANING/PAINTING

1. General

A. This procedure has one task:

- (1) Hydraulic-fluid-resistant finish application

TASK 51-21-61-390-801

2. Hydraulic Fluid Resistant Finish Application

A. General

- (1) This task tells how to prepare and clean the surface, and how to apply the hydraulic fluid resistant finish.
- (2) This task also tells how to mix the material, establish a pot life, and gives general information about the catalyst and base compound.

B. Consumable Materials

Reference	Description	Specification
B00005	Cleaner - Alkaline - Cee Bee 280	
B00083	Solvent - Aliphatic Naphtha (For Acrylic Plastics)	TT-N-95 Type II, ASTM D-3735 Type III
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00402	Cleaner - Aerospace Equipment	MIL-PRF-87937
B00571	Coating - Clear Hydraulic Fluid Resistant Topcoat	BAC5710, Type 41
B01005	Solvent - Final Cleaning Of All Organic Coatings Prior To Painting (AMM 20-30-85/201) - Series 85	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054

C. Prepare the Surface

SUBTASK 51-21-61-120-001

- (1) Rub the high gloss plastic or painted surface lightly with abrasive mat, G00251 or abrasive cloth, B00102.

NOTE: Do not rub the painted surface around decals when the hydraulic fluid resistant coating is used to seal the edges.

SUBTASK 51-21-61-140-001

(2) Clean the surface as follows:

- (a) For decals, placards, and stencils, apply cleaner, B00402 with a cotton wiper, G00034.
 - 1) Rub the area until it is clean.
 - 2) Dry the area with a clean cotton wiper, G00034.

NOTE: Make sure the area is clean.

- 3) Fully clean the area again if it is necessary.

- (b) For plastic (thermoplastic) surfaces, apply Cee Bee 280 cleaner, B00005 with a cotton wiper, G00034.

NOTE: When a solvent is necessary, use Series 85 solvent, B01005.

- 1) Rub the area until it is fully clean.

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2) Dry the area with a clean cotton wiper, G00034.

NOTE: Make sure the area is clean.

3) Clean the area again if it is not fully clean.

(c) For all other surfaces:

1) Fully clean the surface with a clean cotton wiper, G00034 that is moist with solvent, B00083.

2) Before the solvent dries, rub dry the surface with a clean dry cotton wiper, G00034.

3) Clean the area again if it is not fully clean.

SUBTASK 51-21-61-350-001

(3) Repair all the damaged hydraulic fluid resistant finish.

(a) Fully clean the area again.

D. Prepare (Mix) the Hydraulic Fluid Resistant Finish

SUBTASK 51-21-61-390-001

CAUTION: USE CLEAN SOLVENT RESISTANT CONTAINERS WHEN YOU MIX THE HYDRAULIC FLUID RESISTANT FINISH. RECOMMENDED CONTAINERS ARE METAL, POLYETHYLENE AND POLYPROYLENE. DO NOT USE CONTAINERS THAT CONTAIN ORGANIC COATINGS. DIRTY CONTAINERS AND ORGANIC COATINGS CAN CAUSE CONTAMINATION OF THE MIXTURE.

(1) Fully mix 1 part (by volume) of the Catalyst (X-310) to 2 parts (by volume) of the base (683-3-2) to make coating, B00571.

(a) Mix the base component continuously, when you add the catalyst.

(b) Immediately after you mix the compound, identify the container with a label.

NOTE: The compound has a pot life of 4 hours at 70°F (21.1°C). Do not use the compound when its pot life has ended. The use of the compound when its pot life has ended, will decrease its performance.

NOTE: Keep the materials that were not mixed, at a temperature between 40°F and 90°F (4.4-32.2°C). You can keep the materials that were not mixed for 12 months from the date of manufacture.

1) Write the date and the hour when the compound was mixed,

2) Write the date and hour when the pot life ends.

E. Apply the Hydraulic Fluid Resistant Finish

SUBTASK 51-21-61-350-002

(1) Do the steps that follow to Apply the Hydraulic Fluid Resistant Finish:

(a) Before you apply the hydraulic fluid resistant finish on sealants, permit the sealant to become fully dry.

(b) Make sure the surface is fully clean before you apply the hydraulic fluid resistant finish.

(c) Apply the hydraulic fluid resistant finish with a spray gun or brush until the finish is 1 to 2 mils (0.001 to 0.002 inch) (0.025-0.051 mm) thick.

NOTE: The temperature must be more than 65°F (18.3°C) and the relative humidity must be less than 85 percent for best results.

(d) Apply the hydraulic fluid resistant finish on the decals.

1) Make sure you apply a 1/4 inch (6.35 mm) overlap of sealant to the decal.

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- a) A 1/4 inch (6.35 mm) overlap of sealant to the decal will seal the edges of the decal.
- (e) Make sure the hydraulic fluid resistant finish is bonded to all applicable surfaces.

SUBTASK 51-21-61-390-002

- (2) Let the hydraulic fluid resistant finish dry for 4 hours at 65°F (18.3°C) (minimum), before you move the airplane to an open area.

NOTE: A time of 14 days at 65°F (18.3°C) (minimum) is necessary before the hydraulic fluid resistant finish is fully cured.

————— **END OF TASK** —————

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CONDUCTIVE COATING FOR EXTERNAL SURFACES - CLEANING/PAINTING

1. General

- A. This procedure has this task:
 - (1) Apply Conductive Coating to Specified External Surfaces.
- B. When you apply conductive coatings to non-conductive, external airplane surfaces, it is to:
 - (1) Help discharge static electrical charges to the primary airplane structure, and
 - (2) Help the positive grounding of the static electrical charges to the airplane structure.
- C. Do not apply conductive coatings to the radome.

TASK 51-21-71-370-801

I 2. Apply BMS 10-21 Type III Conductive Coating to Specified External Surfaces

A. References

Reference	Title
51-21-00-100-801	Airplane Surface Preparation for Application of Finish (P/B 701)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-591	Multimeter - Digital, Handheld (volt dc/vac, ampere & resistance measurements or equivalent Multimeter) (Part #: 187, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: 189, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: 87V, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: FLUKE 117, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: MODEL 27, Supplier: 89536, A/P Effectivity: 737-ALL)
STD-1080	Brush - Paint
STD-1133	Gun - Spray, Paint, with Interchangable Nozzles
STD-10361	Probe - Film Resistance Measure

C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - Aliphatic Naphtha (For Acrylic Plastics)	TT-N-95 Type II, ASTM D-3735 Type III
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
C00767	Coating - Anti-Static Coating	BMS10-21, Type III
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G50077	Abrasive - Aluminum Oxide Paper, 240 grit or finer	
G50630	Tape - Copper Foil With Conductive Adhesive (3M 1181 Tape)	

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D. Procedure

SUBTASK 51-21-71-100-001

WARNING: DO NOT GET PAINT MATERIALS AND SOLVENTS IN YOUR MOUTH, IN YOUR EYES, ON YOUR SKIN, OR ON YOUR CLOTHES. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. MAKE SURE THE AIR FLOWS FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME, AND TEMPERATURES ABOVE THE FLASH POINT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Airplane Surface Preparation for Application of Finish, TASK 51-21-00-100-801.

SUBTASK 51-21-71-370-001

(2) Prepare the BMS 10-21 Type III conductive coating, C00767 with the steps as follows:

- (a) Refer to the manufacturer's instructions to mix the conductive coating.
- (b) Fully shake each conductive coating component before you mix it.

NOTE: The conductive coating is supplied in two component kits. The kits have a base component and a catalyst.

- (c) Put a label on the container with, the data that follows, immediately after it is mixed:
 - 1) The date and time it was mixed,
 - 2) The pot life expiration time is as follows:
 - a) 4 hours if the temperature is less than 81°F (27°C)
 - b) 2 hours if the temperature is 81°F (27°C) to 100°F (38°C).
- (d) Do not use the conductive coating for a minimum of 30 minutes after it is mixed.

SUBTASK 51-21-71-370-002

(3) Apply the BMS 10-21 Type III conductive coating, C00767 compound with a paint spray gun with interchangeable nozzles, STD-1133 or paint brush, STD-1080.

- (a) Be sure that the temperature for the application of the coating, C00767, must be 40°F (4°C) to 100°F (38°C). The preferred temperature is 50°F (10°C) to 90°F (32°C).
- (b) The dry film thickness after it has been cured must be 0.0006 ± 0.0002 in. (0.0152 ± 0.0051 mm).

SUBTASK 51-21-71-370-003

(4) Cure the BMS 10-21 Type III conductive coating, C00767 with one of the steps that follow:

- (a) Let the conductive coating that is in fastener holes cure for at least 20 minutes at 70°F (21°C) to 90°F (32°C) before you install the fasteners.
- (b) Air dry the surface of the conductive coating for 2 hours at 60°F (16°C).
- (c) To cure the conductive coating quickly, apply a minimum temperature of 140°F (60°C) before you do the resistivity measurements (Figure 701).

NOTE: The increased drying time as shown in Figure 701 is not a full cure.

- 1) The flash-off time necessary before the higher temperature cure is 15 minutes minimum at 75 ± 15°F (24 ± 8°C).
- 2) The cool-off time necessary before subsequent processing the cure is 15 minutes minimum at 75 ± 15°F (24 ± 8°C).

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SUBTASK 51-21-71-700-001

- (5) Do the steps that follow to measure the resistivity of the conductive coating (Fastener-to-Conductive Surface Test Method):

NOTE: The resistivity of the conductive coating after it is cured must be no more than 300,000 ohms/square.

NOTE: Let the conductive coat cure for the specified time as shown in (Figure 701) before you measure the conductivity.

- (a) If the bonding surface and the head of the fastener are covered with a finish, (Figure 702) do the steps as follows:

- 1) Remove a sufficient quantity of the outer coating or paint to let the probes touch the conductive finish.

NOTE: If it is necessary, you can push the probes through the outer coating.

- 2) Put the handheld digital multimeter, COM-591 with the film resistance measure probe, STD-10361 in direct contact with the bonding fastener and the conductive finish.

- a) Put the film resistance measure probe, STD-10361 1.00 ± 0.25 in. (25.40 ± 6.35 mm) apart as shown in (Figure 702).

- 3) Make a record of the value of the resistivity shown on the multimeter.

- a) The maximum permitted resistivity is 300,000 Ohms/Square.

SUBTASK 51-21-71-700-002

- (6) Do the steps that follow to measure the resistivity of the conductive coating on uninstalled panels (Fastener-to-Fastener Test Method):

NOTE: The resistivity of the conductive coating after it is cured must be no more than 300,000 ohms/square

- (a) Make sure the conductive coating shows in the fastener location.

- (b) Clean the area with solvent, B00083.

- (c) Install one temporary fastener at each fastener location to be measured. (Figure 702).

NOTE: This procedure can be used for measuring electrical resistivity of panels with covered (painted) conductive coatings when the ground fastener locations show.

- (d) Connect the multimeter probes at the two fasterer locations as shown in (Figure 702).

- (e) Measure the resistivity with the multimeter.

- 1) The maximum permitted resistivity is 300,000 Ohms/Square.

- (f) Remove the temporary fasteners from the surface.

SUBTASK 51-21-71-700-003

- (7) Do the steps that follow to measure the resistivity of the conductive coating (Square Test Method): (Figure 703)

NOTE: The term ohms/square is used to give the resistance in ohms of current passing from one side of a square region to the opposite side, regardless of the size of the square.

NOTE: Do not use this procedure to measure the resistivity of conductive finishes when the surface is covered(painted).

- (a) Put two pieces of 3M 1181 copper foil tape, G50630 (of equal length (L)) parallel to each other on the conductive coating surface.

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- (b) The two strips of 3M 1181 copper foil tape, G50630 must be put parallel to each other a distance of one tenth the length of the two strips (0.1L \pm 5 percent).
- (c) Push the two strips of 3M 1181 copper foil tape, G50630 against the conductive coating.
- (d) Measure the resistivity with a multimeter (handheld digital multimeter, COM-591).
 - 1) The measured value multiplied by 10 gives the value of resistivity in ohms/square.

NOTE: The term ohms/square is used because it gives the resistance in ohms of current passing from one side of a square region to the opposite side, regardless of the size of the square.

NOTE: The maximum permitted resistivity is 300,000 Ohms/square.

- (e) Remove the 3M 1181 copper foil tape, G50630 from the surface.

SUBTASK 51-21-71-370-004

- (8) Do the steps that follow if the resistivity of the conductive coating is more than 300,000 ohms/square:
 - (a) Use 240 grit or finer abrasive cloth, B00102 paper to remove the conductive coating.

NOTE: If the abrasive cloth, B00102 is not available, use a abrasive mat, G00251, or 240 grit or finer abrasive paper, G50077 as an alternate.
 - (b) Remove the remaining particles with a clean cotton wiper, G00034 that is moist with solvent, B00083.
 - (c) Dry the surface with a clean cotton wiper, G00034 before the solvent is dry.
 - (d) Do the steps to apply a new layer of conductive coating.
 - (e) Do the steps to cure the conductive coating.
 - (f) Do the steps to measure the resistivity of the new layer of conductive coating.

————— **END OF TASK** —————

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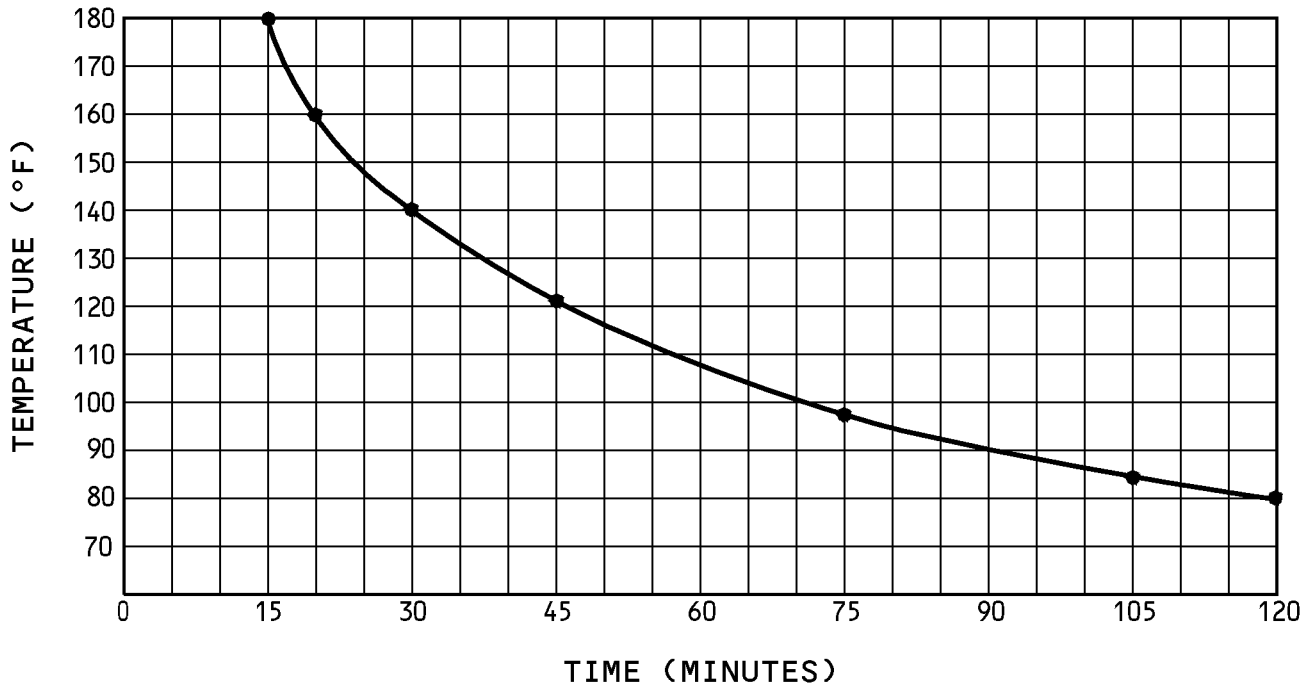
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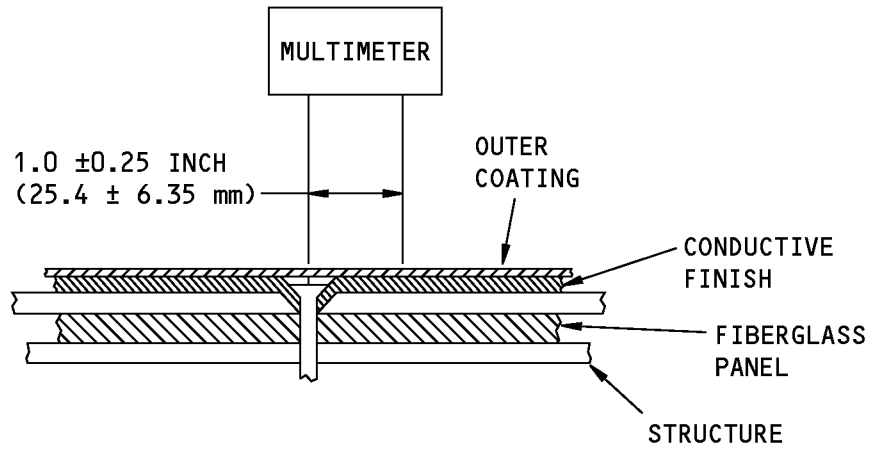


Conductive Coating Increased Cure Times
Figure 701/51-21-71-990-801

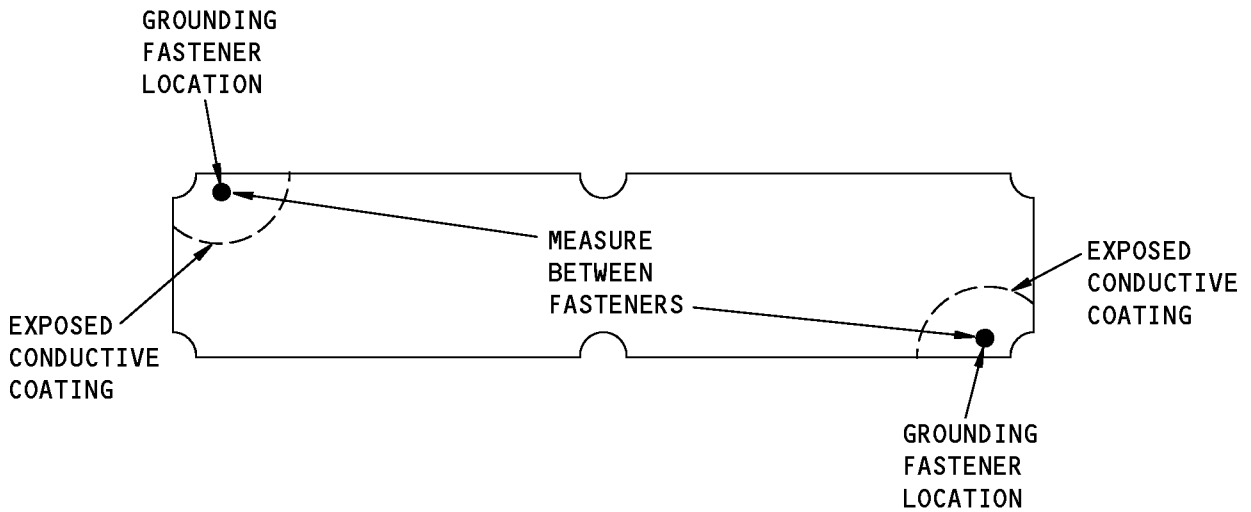


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**RESISTANCE MEASUREMENT
OF CONDUCTIVE FINISH**



**RESISTANCE MEASUREMENT
OF CONDUCTIVE FINISH
WITH EXPOSED FASTENERS**

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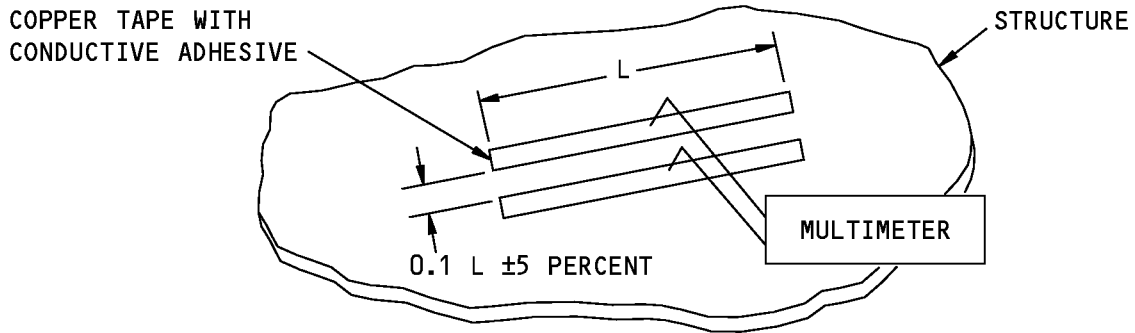
**Resistance Measurement of Conductive Finish
Figure 702/51-21-71-990-802**

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**Measuring Resistance of Conductive Finish by the Ohms Per Square Procedure
Figure 703/51-21-71-990-803**

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ABRASION-RESISTANT TEFLON FINISH - CLEANING/PAINTING

1. General

A. This procedure contains several tasks as follows:

- (1) Preparation of the surface to be finished.
- (2) Application of the BMS 10-86 Type I Coating.
- (3) Application of the BMS 10-86 Type II Coating.
- (4) Application of the BMS 10-86 Type III Coating.

TASK 51-21-81-100-801

2. Prepare the Surface to be Finished

A. Consumable Materials

Reference	Description	Specification
B00068	Alcohol - Ethyl (Denatured)	AMS 3002F (MIL-E-51454, Type II)
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00130	Alcohol - Isopropyl	TT-I-735
B00666	Solvent - Methyl Propyl Ketone	BMS 11-9
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G50079	Scraper - Wood or Plastic	

B. Procedure

SUBTASK 51-21-81-120-002

(1) Prepare the Surface to be Finished.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Clean the surface with a clean cotton wiper, G00034 that is moist with one of the solvents as follows:

- 1) alcohol, B00068
- 2) alcohol, B00130
- 3) solvent, B00666

(b) Dry the surface with a clean cotton wiper, G00034 before the solvent dries.

CAUTION: ONLY USE APPROVED SCRAPERS ON THE AIRPLANE SKIN. SCRAPERS THAT ARE NOT APPROVED CAN MAKE SCRATCHES ON THE SKIN, AND CAUSE FATIGUE CRACKS.

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(CAUTION PRECEDES)

CAUTION: DO NOT USE ABRASIVE PADS (SCOTH-BRITE), OR ABRASIVE PAPER ON THE ALUMINUM SURFACE UNLESS THE SCRIBE LINE INSPECTIONS WERE MADE. ABRASIVE PADS CAN SMOOTH THE ALUMINUM SURFACE AND HIDE THE SCRIBE LINE MARKS. IF YOU USE ABRASIVE PADS TO REMOVE THE PAINT OR REQUIRED TO DO REPEAT INSPECTIONS BASED ON THE SCRIBE LINE INSPECTION SERVICE BULLETIN.

- (c) Remove all unwanted material from the surface. Use an approved scraper, G50079 to clean around fasteners, seams, and lap joints.

NOTE: An abrasive mat, G00251 or abrasive cloth, B00102 may be used instead of the scraper.

- (d) Clean the surface again with a cotton wiper, G00034 that is moist with the solvent.
- (e) Dry the surface with a clean cotton wiper, G00034 before the solvent dries.

————— **END OF TASK** —————

TASK 51-21-81-370-801

3. Apply The Abrasion-Resistant Teflon Finish, BMS 10-86 Type I

A. Tools/Equipment

Reference	Description
STD-9077	Spray Gun

B. Consumable Materials

Reference	Description	Specification
C00304	Coating - Teflon Filled, Non Decorative, Sprayable Material	BMS 10-86 Type I
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)

C. Procedure

SUBTASK 51-21-81-370-001

- (1) Do these steps to apply the BMS 10-86 Type I coating, C00304:

NOTE: BMS 10-86, Type I is a non-decorative, sprayable material with a minimum pot life of 2 hours.

- (a) Clean all equipment before you mix the contents of the BMS 10-86, Type I coating, C00304.
- (b) Follow the manufacturer's instructions to mix the contents of the BMS 10-86 Type I coating, C00304.
- (c) Follow the manufacturer's instructions to achieve the required viscosity of the BMS 10-86 Type I coating, C00304.
- (d) Apply Scotch Flatback Masking Tape 250, G00270 on all adjacent areas.
- (e) Use a spray gun, STD-9077 to apply the BMS 10-86 Type I coating, C00304.
- (f) Let each layer of BMS 10-86 Type I coating, C00304 dry for 5 minutes.
- (g) Apply a total of four or five layers.
- (h) Follow the manufacturer's instructions before you touch the surface.

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- (i) Follow the manufacturer's instructions to cure the BMS 10-86 Type I coating, C00304.
- (j) Remove the Scotch Flatback Masking Tape 250, G00270.

————— END OF TASK —————

TASK 51-21-81-370-802

4. Apply The Abrasion-Resistant Teflon Finish, BMS 10-86 Type II

A. Tools/Equipment

Reference	Description
STD-9077	Spray Gun

B. Consumable Materials

Reference	Description	Specification
C50149	Coating - Teflon Filled, Non Decorative, Brushable or Sprayable Material	BMS 10-86 Type II
G00268	Brush - Soft Bristle, Paint	
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)

C. Procedure

SUBTASK 51-21-81-370-005

- (1) Do these steps to apply the BMS 10-86, Type II coating, C50149 with a brush, G00268 (Brushable Method):

NOTE: BMS 10-86, Type II is a non-decorative, brushable or sprayable material with a minimum pot life of 30 minutes.

- (a) Clean all equipment before you mix the contents of the BMS 10-86, Type II coating, C50149.
- (b) Follow the manufacturer's instructions to mix the contents of the BMS 10-86, Type II coating, C50149.
- (c) Follow the manufacturer's instructions to achieve the required viscosity of the BMS 10-86, Type II coating, C50149.
- (d) Apply Scotch Flatback Masking Tape 250, G00270 on all adjacent areas.
- (e) Apply the BMS 10-86, Type II coating, C50149 with a brush, G00268 in only one direction.
- (f) Follow the manufacturer's instructions before you touch the surface.
- (g) Follow the manufacturer's instructions to cure the coating, C50149.
- (h) Remove the Scotch Flatback Masking Tape 250, G00270.

SUBTASK 51-21-81-370-006

- (2) Do these steps to apply the BMS 10-86, Type II coating, C50149 with a spray gun, STD-9077 (Sprayable Method):

NOTE: BMS 10-86, Type II is a non-decorative, brushable or sprayable material with a minimum pot life of 30 minutes.

- (a) Clean all equipment before you mix the contents of the BMS 10-86, Type II coating, C50149.
- (b) Follow the manufacturer's instructions to mix the contents of the BMS 10-86, Type II coating, C50149.
- (c) Follow the manufacturer's instructions to achieve the required viscosity of the BMS 10-86, Type II coating, C50149.

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- (d) Apply Scotch Flatback Masking Tape 250, G00270 on all adjacent areas.
- (e) Apply the BMS 10-86, Type II coating, C50149 with a spray gun, STD-9077.
- (f) Let each layer of BMS 10-86 Type II sprayable coating dry for 5 minutes.
- (g) Apply a total of four or five layers.
- (h) Follow the manufacturer's instructions before you touch the surface.
- (i) Follow the manufacturer's instructions to cure the BMS 10-86 Type II coating, C50149.
- (j) Remove the Scotch Flatback Masking Tape 250, G00270.

————— **END OF TASK** —————

TASK 51-21-81-370-803

5. Apply The Abrasion-Resistant Teflon Finish, BMS 10-86 Type III

A. Tools/Equipment

Reference	Description
STD-9077	Spray Gun

B. Consumable Materials

Reference	Description	Specification
C50150	Coating - Teflon Filled, Decorative, Sprayable Material	BMS 10-86 Type III
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)

C. Procedure

SUBTASK 51-21-81-370-007

(1) Do these steps to apply the BMS 10-86 Type III coating, C50150:

NOTE: BMS 10-86, Type III is a decorative, sprayable material with a minimum pot life of 3 hours.

- (a) Clean all equipment before you mix the contents of the BMS 10-86, Type III coating, C50150.
- (b) Follow the manufacturer's instructions to mix the contents of the BMS 10-86, Type III coating, C50150.
- (c) Follow the manufacturer's instructions to achieve the required viscosity of the BMS 10-86, Type III coating, C50150.
- (d) Apply Scotch Flatback Masking Tape 250, G00270 on all adjacent areas.
- (e) Use a spray gun, STD-9077 to apply a layer of the BMS 10-86, Type III coating, C50150.
- (f) Let each layer of BMS 10-86, Type III coating, C50150 dry for 5 minutes.
- (g) Apply a total of four or five layers.
- (h) Follow the manufacturer's instructions before you touch the surface.
- (i) Follow the manufacturer's instructions to cure the BMS 10-86, Type III coating, C50150.
- (j) Remove the Scotch Flatback Masking Tape 250, G00270.

————— **END OF TASK** —————

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CORROSION INHIBITING COMPOUND - CLEANING/PAINTING

1. General

- A. This procedure contains these tasks:
 - (1) Surface Preparation for Corrosion Inhibiting Compound
 - (2) Application of Corrosion Inhibiting Compound
 - (3) Cure of Corrosion Inhibiting Compound
 - (4) Repair of Corrosion Inhibiting Compound Coating
 - (5) Removal of Excess Corrosion Inhibiting Compound
- B. The function of the BMS3-23 Corrosion Inhibiting Compound is to go into the mating structure to make sure a thin layer stays. This film displaces moisture for corrosion prevention. The application of BMS3-23 to open areas is not as important.
- C. The function of the BMS3-26 Corrosion Inhibiting Compound is used in areas of the airframe subject to severe corrosive environments. It can be applied to painted and unpainted surfaces.
- D. The function of the BMS3-29 Corrosion Inhibiting Compound is to go in between mated structure and to make a protective overcoat on open areas. The primary purpose of BMS3-29 is for use in areas of high surface moisture (i.e. bilge areas).
- E. The function of the BMS3-35 Corrosion Inhibiting Compound combines good penetration properties into inaccessible areas and provides a tack free film. The primary purpose of BMS3-35 is for touch up of areas and general corrosion prevention.
- F. Corrosion inhibiting compound is translucent in nature and gives superior protection from corrosion when it is applied to the specification limits.
- G. Corrosion inhibiting compound is not necessary in the areas where titanium structures and aluminum structures touch (interface).
- H. Electrical connectors must be taped with masking tape to prevent contamination of electrical contacts. Overspray is permitted on joined connectors.
 - (1) Do not apply corrosion inhibiting compound directly to electrical components (i.e. electrical motors or switches).
- I. Make sure you do not apply too much corrosion inhibiting compound. Too much compound will make it not easy for in-service inspections of the surface structures below the compound.

TASK 51-21-91-620-801

2. Surface Preparation for Corrosion Inhibiting Compound

A. Consumable Materials

Reference	Description	Specification
B00074	Solvent - Degreasing	MIL-PRF-680 (Supersedes P-D-680)
B00093	Solvent - Tetrachloroethylene (Perchloroethylene)	ASTM D4081
B00316	Solvent - Aliphatic Naphtha (For Organic Coatings)	TT-N-95 Type I, ASTM D-3735 Type I
B00634	Solvent - Stabilized Limonene Cleaner	BMS11-10 Type 1, 2, or 3
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

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Reference	Description	Specification
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)
G50305	Sheeting - Plastic, Polyethylene	

B. Procedure

SUBTASK 51-21-91-620-001

(1) Do these steps to prepare the surface for the corrosion inhibiting compound.

(a) Do these steps to clean the surfaces:

- 1) Vacuum the surfaces as necessary to remove moisture and other excessive foreign material.
- 2) Wipe the surfaces with a cloth (cotton wiper, G00034) as necessary to remove additional moisture or other foreign materials.

WARNING: DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE IN THE FUMES FROM THE SOLVENT. MAKE SURE TO PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN USING THE SOLVENT. KEEP THE SOLVENT AWAY FROM SPARKS, FLAMES AND HEAT. THE SOLVENT IS POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY OR DAMAGE IF NOT HANDLED PROPERLY.

(b) When the area is very dirty, clean the surface with one of these applicable solvents:

NOTE: You must fully clean the surface to help the corrosion inhibiting compound get on the surface and in the mating surfaces.

- 1) solvent, B00074.
- 2) solvent, B00093.
- 3) solvent, B00316.
- 4) Limonene solvent, B00634

SUBTASK 51-21-91-600-003

(2) Apply Scotch Flatback Masking Tape 250, G00270 and plastic sheeting, G50305 to the area where you will not apply the corrosion preventive compound.

SUBTASK 51-21-91-600-002

WARNING: DO NOT APPLY THE CORROSION-INHIBITING COMPOUNDS IN THE AREAS THAT HAVE OXYGEN SYSTEM COMPONENTS. THE MIXTURE OF CORROSION-INHIBITING COMPOUNDS, AND OXYGEN CAN CAUSE AN EXPLOSION. AN EXPLOSION CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

(3) Make sure you keep all corrosion inhibiting compounds out of the oxygen system components that follow:

NOTE: Masking tape is not sufficient. Use plastic sheets or equivalent covers to fully seal these components from the compound.

- (a) Bottles.
- (b) Pressure metering equipment.
- (c) Indicating equipment.
- (d) Connections.

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SUBTASK 51-21-91-280-001

(4) Do not apply corrosion inhibiting compound to the areas that follow:

- (a) Near the engines.
- (b) Cowlings.
- (c) Areas of high temperature or where firewall sealant is used.

NOTE: High temperature causes deterioration in corrosion preventive compounds.

- (d) Electrical ground strap/surface interfaces to make sure you have a sufficient ground path.
- (e) Bare surfaces that get a layer of primer and paint.

NOTE: It is not easy to apply a primer and paint on the corrosion preventive compound. The corrosion preventive compound gets in the surface and can bleed-out. This can cause the primer and paint to have a unsatisfactory bond.

- 1) Let the primer and enamel dry for a minimum of 8 hours before you apply the corrosion preventive compound.
- (f) Sliding pins and other mechanical joints in a sliding surface contact.
- (g) Actuator rods.

NOTE: Corrosion preventive compound such as BMS 3-23 or all other hydrocarbons can cause damage to the seals that are used with BMS 3-11 hydraulic fluid.

SUBTASK 51-21-91-600-001

(5) The areas that follow must be shielded or protected to make sure the corrosion inhibiting compound is not applied:

- (a) Control cables and pulleys.
- (b) Wire bundles, coax connectors.
- (c) Mechanical silicone seals.
- (d) Insulation blankets.
- (e) Bushing and bearings.
- (f) Cam surfaces.
- (g) Lubricated components.
- (h) Pneumatic ducts with surface temperatures that are more than 200°F (93°C) during normal operations.
- (i) Applicable drain valves.
- (j) Areas that will be painted or sealed.
- (k) High visual items such as doorways, hatches, and window frames.

————— END OF TASK —————

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TASK 51-21-91-620-802

3. Application of Corrosion Inhibiting Compound

A. General

WARNING: THE BMS3-23 AND BMS3-29 ARE HAZARDOUS MATERIALS. WHEN YOU SPRAY THESE COMPOUNDS IN A CLOSED AREA, A GAS CONCENTRATION OF 500 PPM (PARTS PER MILLION) IS THE MAXIMUM COMFORTABLE AND SAFE WORKING LIMIT. AT THIS CONCENTRATION, A PERSON CAN WORK FOR 8 HOURS. GAS LEVELS MORE THAN 500 PPM ARE NOT FULLY HAZARDOUS, BUT YOU MUST SUPPLY A FLOW OF AIR TO KEEP THE AREA COMFORTABLE AND SAFE. IF YOU DO NOT FOLLOW THESE INSTRUCTIONS, INJURY TO PERSONS CAN OCCUR.

WARNING: ALIPHATIC NAPHTHA IS THE RECOMMENDED SOLVENT AND IS ALSO TOXIC. WHEN NAPHTHA IS USED IN A CONFINED SPACE, MECHANICAL VENTILATION IS MANDATORY. RESPIRATORY DEVICES AND SKIN PROTECTION ARE NECESSARY. IF YOU DO NOT FOLLOW THESE INSTRUCTIONS, INJURY TO PERSONS CAN OCCUR.

- (1) This procedure gives instructions to apply the water-displacing corrosion preventive compound. We recommended that you apply the compound periodically.

NOTE: Each airline must know it's aircraft's environment, the corrosion inhibiting compounds they use, and when it was applied. If not, the corrosion protection can be unsatisfactory. Boeing recommends BMS3-23, BMS3-26, BMS3-29 and BMS3-35 and has made them a standard for organic corrosion inhibitors. But, there are other water-displacing corrosion inhibiting compounds that are satisfactory for use.

CAUTION: KEEP BMS3-23 AWAY FROM SURFACES THAT CAN BE 150°F (66°C) OR MORE DURING USE. THE DRY FILM FLASH POINT IS 500°F (260°C). THE BMS 3-23 CAN CAUSE A FIRE OR AN EXPLOSION.

- (2) The corrosion preventive compound is not satisfactory for surfaces that can be more than 150°F (66°C) because it contains wax compounds.

B. Consumable Materials

Reference	Description	Specification
B00316	Solvent - Aliphatic Naphtha (For Organic Coatings)	TT-N-95 Type I, ASTM D-3735 Type I
C00755	Compound - Organic Corrosion Inhibiting, Heavy Duty	BMS3-26
C00915	Compound - Organic Corrosion Inhibiting, Advanced	BMS3-29
G00009	Compound - Organic Corrosion Inhibiting	BMS3-23
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G50071	Compound - Corrosion Inhibiting, Heavy Duty	BMS3-35
G50346	Compound - Corrosion Preventive	BMS 3-26 Type 2

C. Procedure

SUBTASK 51-21-91-620-002

- (1) Apply the corrosion inhibiting compound.
(a) Clean surface with solvent, B00316.

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- (b) Apply the corrosion inhibiting compound to a thickness as shown in COATING THICKNESS RANGES Corrosion Inhibiting Compound Coating Thickness Dry Coating Thickness Wet (BMS3-23) Continuous Coat, No Minimum Thickness Continuous Coat, No Minimum Thickness (BMS3-26, Type I) 0.00/ Table 701.

Table 701/51-21-91-993-801

COATING THICKNESS RANGES		
Corrosion Inhibiting Compound	Coating Thickness Dry	Coating Thickness Wet
corrosion inhibiting compound, G00009 (BMS3-23)	Continuous Coat, No Minimum Thickness	Continuous Coat, No Minimum Thickness
compound, C00755 (BMS3-26, Type I)	0.002 ± 0.001 in. (0.051 ± 0.026 mm)	0.004 ± 0.002 in. (0.102 ± 0.051 mm)
Compound, G50346 (BMS3-26, Type II)	0.005 ± 0.001 in. (0.127 ± 0.025 mm)	0.010 ± 0.002 in. (0.254 ± 0.051 mm)
compound, C00915 (BMS3-29)	0.004 ± 0.001 in. (0.102 ± 0.026 mm)	0.008 ± 0.002 in. (0.203 ± 0.051 mm)
compound, G50071 (BMS3-35)	0.002 ± 0.001 in. (0.051 ± 0.026 mm)	0.004 ± 0.002 in. (0.102 ± 0.051 mm)

- (c) The application temperature for BMS3-23, BMS3-26 Type I and BMS3-29, must be between 40°F (4°C) and 100°F (38°C).
- (d) The application temperature for BMS3-26 Type II must be between 50°F (10°C) and 100°F (38°C).
- (e) The application temperature for BMS3-35 must be between 32°F (0°C) and 86°F (30°C).
- (f) Spray or brush the BMS3-23 compound to get a continuous coat.
- (g) Spray or brush either the BMS3-26, BMS3-29 or BMS3-35 compound to get a bubble free coat (after it is dry), with a wet or dry thickness as specified in Table 701.

NOTE: When the BMS3-26, BMS3-29 and BMS3-35 compound is not sprayed, shake or mix the compound before it is used.

- (h) When the compound is applied to parts where it cannot be sprayed or brushed (e.g. slotted tracks), do the step that follows:
 - 1) Fill the area with the compound, and then drain the compound which will give a protective coat.
- (i) When BMS3-29 is specified as an optional material to BMS3-23, use the same specifications as for the BMS3-29.
- (j) Use a cloth (cotton wiper, G00034) to remove the puddles of too much of the compound if the puddles cause a blockage to the drain holes or cross drains.
- (k) Make sure you have a good flow of air in the areas where the corrosion inhibiting compound was applied, as follows:

NOTE: The air flow times are recommended minimum times. A longer air flow time to get a satisfactory evaporation is recommended for lower temperatures, high humidity, and when too much of the compound is applied.

NOTE: You must keep the temperature within the application limits for the material used.

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- 1) After you apply the BMS3-23 in enclosed areas, apply a good air flow to the area for a minimum of one hour before you close-up the area.

NOTE: The one hour will let the volatile solvents in the compound to evaporate.

- 2) After you apply the BMS3-26, BMS3-29 or the BMS3-35 in enclosed areas, apply a good air flow to the area for a minimum of four hours before you close-up the area.
- 3) Do not remove the masking tape or applicable covers until the corrosion inhibiting compound has dried sufficiently. This will make sure the compound will not rub off or move to another surface.
 - a) When the masking tape or covers have been removed, do a touch-up of the corrosion inhibiting compound where it is necessary to prevent corrosion in the areas of a structural interface.

- (l) Do not contaminate the insulation blankets with the corrosion inhibiting compound.

NOTE: These compounds can decrease the ability of the insulation blankets to repel water.

WARNING: DO NOT USE DETERGENTS OR SOLVENTS TO CLEAN THE INSULATION BLANKET. IT CAN REMOVE FLAME RETARDANTS AND CAUSE FLAMMABLE RESIDUES ON THE INSULATION BLANKET WHICH INCREASES THE RISK OF FIRE. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- 1) If contamination occurs, the blanket must be replaced.

————— **END OF TASK** —————

TASK 51-21-91-620-803

4. Cure of Corrosion Inhibiting Compound

A. General

- (1) This task to cure the corrosion inhibiting compound is not necessary when the insulation blankets will not be touched by the compound.
- (2) Cure the corrosion inhibiting compound at the specified application temperature.

B. Consumable Materials

Reference	Description	Specification
G00252	Film, Plastic Sheeting, Polyethylene	L-P-512

C. Cure of Corrosion Inhibiting Compound

SUBTASK 51-21-91-620-003

- (1) Sufficiently cure the corrosion inhibiting compound.

NOTE: This is to make sure the compound does not move from the surface if it is touched by the insulation blankets.

- (a) The test that follows will tell you if the compound is fully cured.
 - 1) Get some film, G00252, 0.002 in. (0.051 mm) to 0.006 in. (0.152 mm) in thickness.
 - 2) Push the film, G00252 against the corrosion inhibiting compound with a light finger pressure.
 - 3) Make a check to see if the corrosion inhibiting compound has moved to the film, G00252 or lifted from the structure.

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(b) The table that follows will give you the approximate cure times.

NOTE: Follow the manufacturers instruction for the applicable cure times.

Table 702/51-21-91-993-802

Approximate Cure Times	
Compound	Time
BMS3-23 ^{*[1]}	1 Hour
BMS3-26, Type I	6 Hours
BMS3-26, Type II	6 Hours
BMS3-29	3 Hours
BMS3-35	1 Hour

*[1] BMS3-23 Class 1, will not cure in 1 hour, however, this is a sufficient amount of time to allow solvents to flash off prior to installation of insulation blankets. BMS3-23 Class 1, does not cure to a tack free coating.

————— **END OF TASK** —————

TASK 51-21-91-620-804

5. Repair of Corrosion Inhibiting Compound Coating

A. General

- (1) The limits of the damage or bubbles in the BMS3-23, BMS3-26, BMS3-29 or BMS3-35 corrosion inhibiting compound in the cured coating is as follows and must be repaired:
 - (a) The coating damage dimension is more than 1 percent of a given 1 ft² (929 cm²).
 - (b) The coating damage dimension is larger than 1 in² (6 cm²).
- (2) All damage or bubbles in the cured BMS3-23, BMS3-26, BMS3-29 and BMS3-35 coating must be repaired.

NOTE: When BMS3-29 or BMS3-35 is specified as optional to BMS3-23, the damage permitted will be the same as that necessary for the BMS3-23.

B. Consumable Materials

Reference	Description	Specification
B00316	Solvent - Aliphatic Naphtha (For Organic Coatings)	TT-N-95 Type I, ASTM D-3735 Type I
B00634	Solvent - Stabilized Limonene Cleaner	BMS11-10 Type 1, 2, or 3

C. Procedure

SUBTASK 51-21-91-620-004

- (1) Do the steps that follow to repair the damaged or contaminated corrosion inhibiting compound.
 - (a) Clean the damaged area with solvent, B00316 or Limonene solvent, B00634.
 - (b) Apply the applicable corrosion inhibiting compound, do this task: Application of Corrosion Inhibiting Compound, TASK 51-21-91-620-802.

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- (c) Cure the corrosion inhibiting compound, do this task: Cure of Corrosion Inhibiting Compound, TASK 51-21-91-620-803.

END OF TASK

TASK 51-21-91-160-801

6. Removal of Excess Corrosion Inhibiting Compound

A. Consumable Materials

Table with 3 columns: Reference, Description, Specification. Rows include B00074 (Solvent - Degreasing), B00090 (Solvent - Inhibited Trichloroethane 1,1,1), B00093 (Solvent - Tetrachloroethylene), B00148 (Solvent - Methyl Ethyl Ketone), B00316 (Solvent - Aliphatic Naphtha), and G00034 (Cotton Wiper).

B. Procedure

SUBTASK 51-21-91-620-005

WARNING: DO NOT GET THE SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE IN THE FUMES FROM THE SOLVENT. MAKE SURE TO PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN USING THE SOLVENT. KEEP THE SOLVENT AWAY FROM SPARKS, FLAMES AND HEAT. THE SOLVENT IS POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY OR DAMAGE IF NOT HANDLED PROPERLY.

- (1) Remove the unwanted corrosion inhibiting compound with a cotton wiper, G00034 that is moist with one of these applicable solvents:

NOTE: Make sure you use the applicable safety precautions when you apply solvent to remove the unwanted corrosion inhibiting compound.

- (a) solvent, B00316.
(b) solvent, B00148.
(c) solvent, B00074.
(d) solvent, B00090.
(e) solvent, B00093.

END OF TASK

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FLOOR TRACK CORROSION PREVENTION - MAINTENANCE PRACTICES

1. General

A. This procedure has this task:

- (1) Apply Filler in the seat tracks.

TASK 51-21-92-600-801

2. Seat Track Filler Application

(Figure 201, Figure 202)

A. General

- (1) Seat track filler prevents corrosion in wet areas of the passenger compartment.
- (2) You can cut and remove parts of the seat track fillers when you remove and install galleys, lavs, and tie down fittings.

B. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142
C00308	Compound - Corrosion Preventive, Petrolatum Hot Application	MIL-C-11796
G02304	Tape - Moisture Barrier	BMS8-346

C. Location Zones

Zone	Area
200	Upper Half of Fuselage

D. Procedure

SUBTASK 51-21-92-620-001

(1) Apply filler sealant, A02315 in the seat tracks as follows:

- (a) Find the seat track locations in the wet areas of the airplane.
- (b) Cut the seat track filler [1] to fit in the seat tracks [3].

NOTE: The seat track filler is pre- formed and commercially available.

NOTE: A gap of 0.25 in. (6.35 mm) is permitted at the skin splice areas.

- (c) Install the seat track filler [1] in the seat track [3].
- (d) Fill the seat track [3] with corrosion preventive compound, C00308.
- (e) Install approximately 2.0 in. (5.1 cm) of sealant, A02315 at the end of the compound filled area to contain the compound.
- (f) Make sure the top surface of the seat track [3] is clean and free of compound.
- (g) Install moisture barrier tape, G02304 [2] on the compound filled seat track [3].

————— **END OF TASK** —————

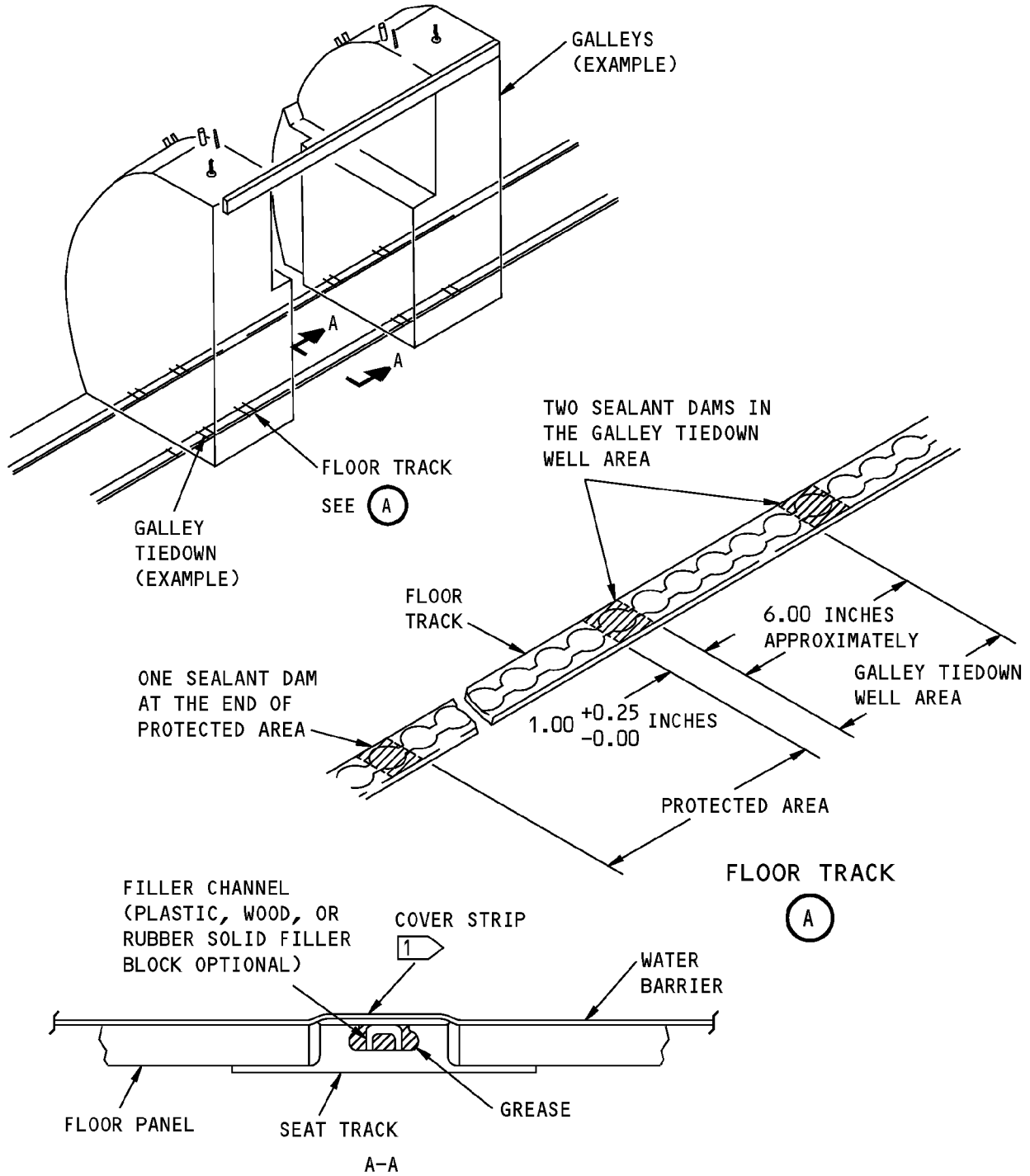
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1 THE COVER STRIP IN THE WALKWAY AREAS ONLY NOT USED BELOW THE GALLEYS.

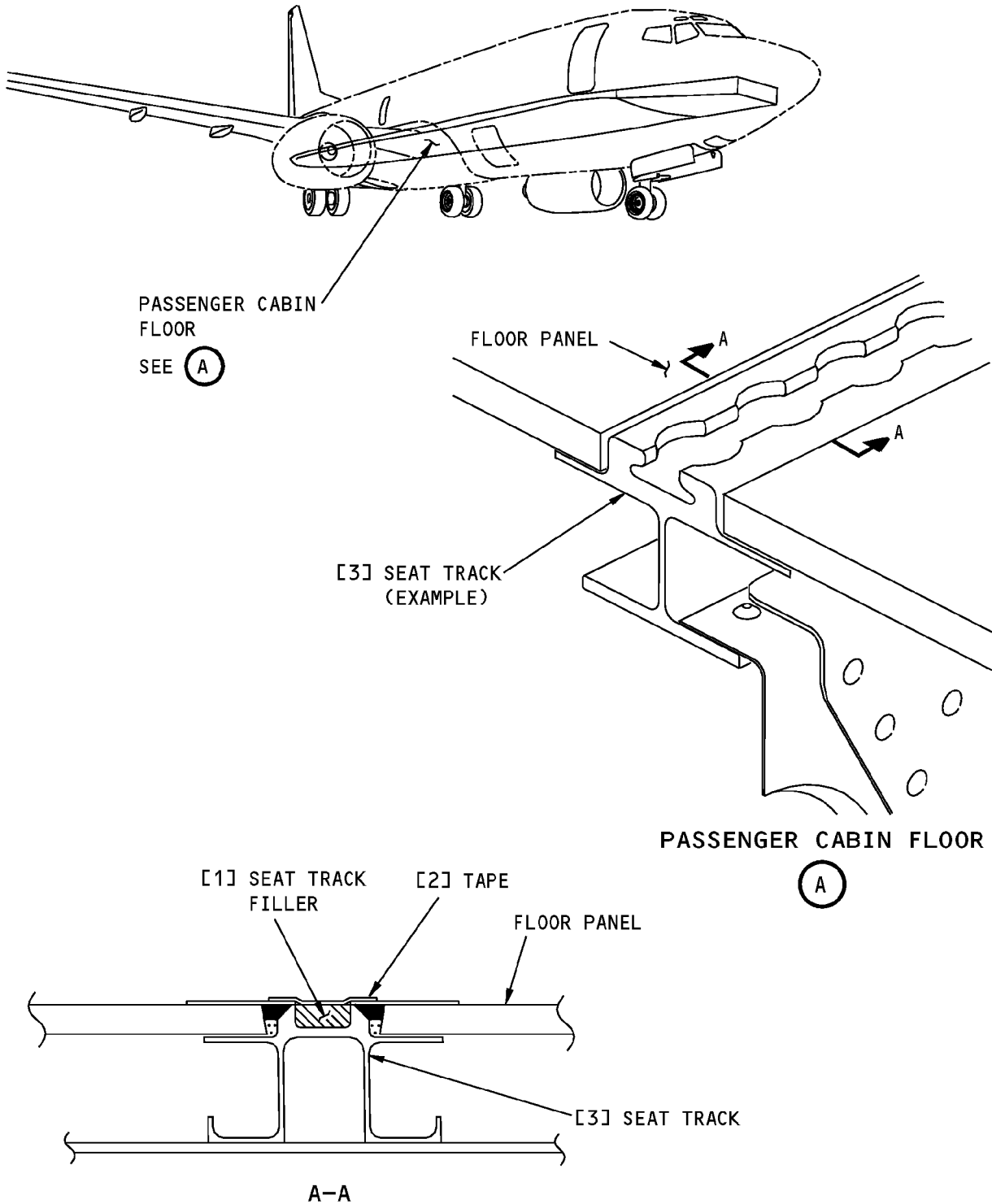
**Floor-Track Corrosion Prevention
Figure 201/51-21-92-990-801**

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**Seat Track Filler Application
Figure 202/51-21-92-990-802**

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NONGLARE FINISH - CLEANING/PAINTING

1. General

- A. This procedure contains the task to apply the nonglare coating per BAC5755, Type 16 and BAC5710, Type 35.

TASK 51-21-93-300-801

2. Nonglare Coating Application

(Figure 701)

A. References

Reference	Title
51-21-21-370-801	Prepare the Surface to be Painted (P/B 701)

B. Tools/Equipment

Reference	Description
STD-9077	Spray Gun

C. Consumable Materials

Reference	Description	Specification
C50117	911-P4 primer	BAC5755 Type 16
C50118	Nextel Suede 3101 two part topcoat kit	BAC5710 Type 35

D. Procedure

SUBTASK 51-21-93-110-001

- (1) Clean and prepare the surface, do this task: Prepare the Surface to be Painted, TASK 51-21-21-370-801.

SUBTASK 51-21-93-370-001

- (2) Mix the 911-P4 primer, C50117:

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (a) Use 2 parts (by volume) of the base to 1 part (by volume) of the thinner.

NOTE: A mixture of two solvents (MEK, MIBK and Toluene) can make the base thin. The mixture must have an equal quantity of each solvent.

SUBTASK 51-21-93-370-002

- (3) Apply the primer, C50117 on the surface.
 - (a) Make sure the dry layer is 0.4-1.0 mils (0.0004-0.001 inch) thick.
 - (b) Let the primer dry (minimum of 10 minutes and maximum of 60 minutes) at 70° to 90°F before you apply the topcoat.

SUBTASK 51-21-93-370-003

- (4) Mix the topcoat kit, C50118:



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- (a) Add 1 part (by volume) of the catalyst component II to 8 parts (by volume) of the base component I.

NOTE: The usual life of the mixture without the promoter component III is 8 hours. If you add the promoter component III, the pot life of the mixture decreases approximately 4 to 6 hours.

- (b) Shake the mixture for 15 minutes.
- (c) Add 1/3 part (by volume) of the thinner.

NOTE: MEK or Xylene, or a mixture of MEK and Xylene can make the mixture thin. If you use the mixture of MEK and Xylene, the materials must be equal in quantity.

- (d) Do not touch or move the mixture for 15 minutes before you use it.
- (e) Make sure the mixture is free from unwanted particles.

SUBTASK 51-21-93-930-001

- (5) Identify the container with a label.

- (a) Write the date and the hour when the mixture was mixed and when the pot life comes to an end.

SUBTASK 51-21-93-370-004

- (6) Apply the topcoat with a spray gun, STD-9077.

- (a) Make sure the dry layer of the topcoat is 2-3 mils (0.002-0.003 inch) (0.051-0.076 mm) thick.

NOTE: If the thickness is more than the specified limits, cracks can occur on the surface.

- (b) Dry the topcoat.

————— END OF TASK —————

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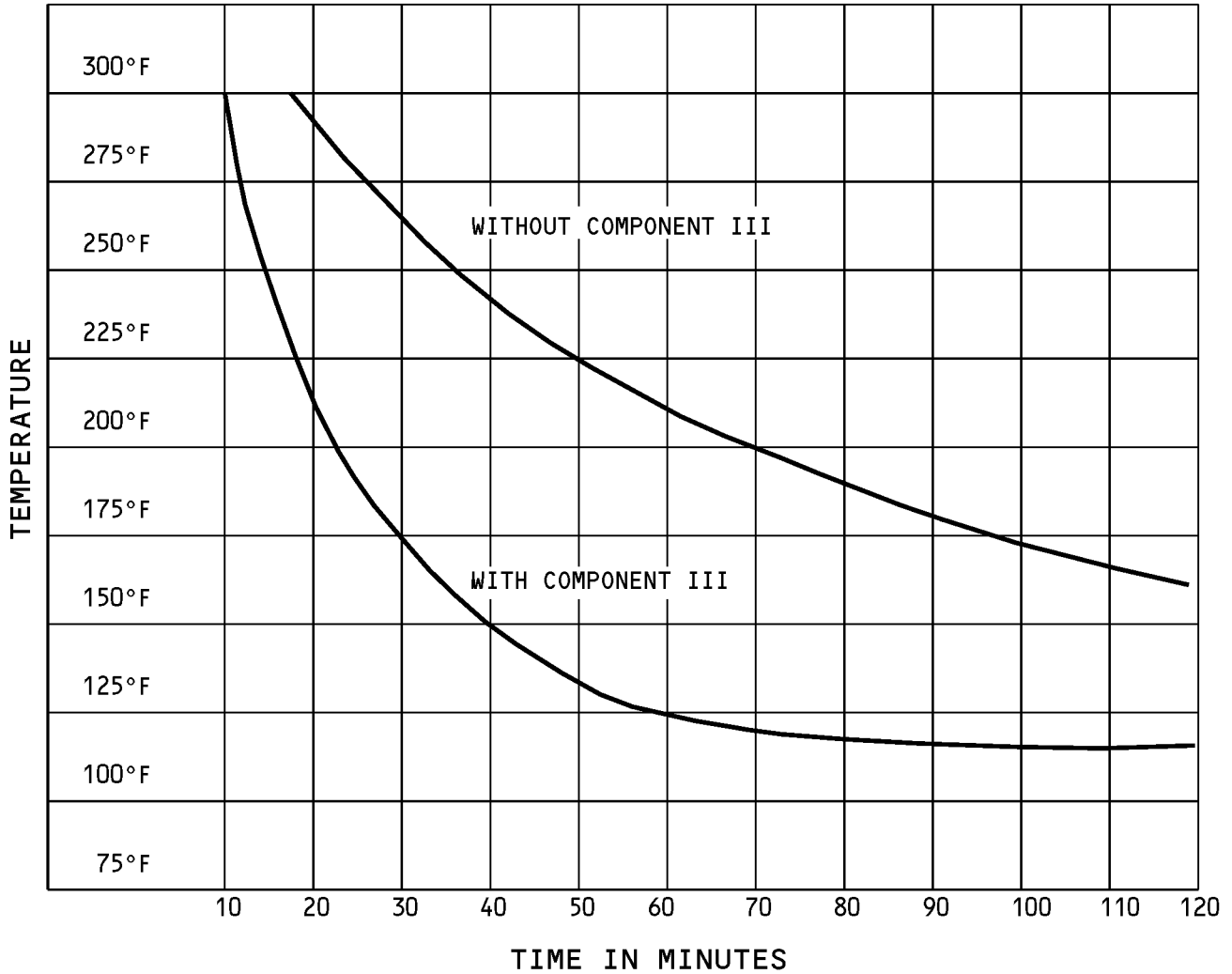
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Topcoat Cure Chart - Nextel Suede 3101
Figure 701/51-21-93-990-801

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ABRASION RESISTANT MOLYBDENUM DISULFIDE FINISH - CLEANING/PAINTING

1. General

A. This procedure contains the task to apply the abrasion resistant molybdenum disulfide finish. The procedure has these parts:

- (1) The preparation of the painted surfaces
- (2) The preparation of the abrasion resistant finish
- (3) The application of the abrasion resistant finish
- (4) The repair of the damaged surfaces.

TASK 51-21-94-300-801

2. Abrasion Resistant Molybdenum Disulfide Finish Application

(Figure 701, Figure 702)

A. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved (Part #: 1-6390-A, Supplier: 63318, A/P Effectivity: 737-ALL) (Part #: 10810, Supplier: \$0855, A/P Effectivity: 737-ALL) (Part #: 234350, Supplier: \$0857, A/P Effectivity: 737-ALL) (Part #: 311, Supplier: KA861, A/P Effectivity: 737-ALL) (Part #: 411B60, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: 411B90, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: DAD5013, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: DFD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: J5-0275-2010, Supplier: 435R8, A/P Effectivity: 737-ALL) (Part #: SCD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: ST982LF, Supplier: 3Z323, A/P Effectivity: 737-ALL) (Part #: TS1275-4, Supplier: 1DWR5, A/P Effectivity: 737-ALL)
STD-1133	Gun - Spray, Paint, with Interchangeable Nozzles
STD-3911	Brush - Bristle, Medium Nylon

B. Consumable Materials

Reference	Description	Specification
B00094	Solvent - Toluene	A-A-59107
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00151	Solvent - Methyl Isobutyl Ketone	ASTM D1153
B00344	Solvent - Xylene, Nitration Grade	ASTM D843
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

C. Prepare the Surface

SUBTASK 51-21-94-180-001

- (1) Prepare the aluminum surfaces.
 - (a) Apply a layer of chromic acid anodizing or alodizing to all aluminum surfaces.
 - (b) Apply a layer of primer, C00259, epoxy primer.

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- (c) Let the primers dry before you apply the abrasion resistant finish.
 - 1) Let the primers dry for a minimum of 1 hour at room temperature or 15 minutes at 150° ± 15°F (65.6° ± 8.3°C).

SUBTASK 51-21-94-180-002

- (2) Prepare the painted surfaces.
 - (a) If it is less than 48 hours since you applied the BMS 10-11 epoxy primer:
 - 1) Clean the surface with solvent, B00094.
 - 2) Dry the surface with a clean, dry cotton wiper, G00034.
 - (b) If it is more than 48 hours since you applied the BMS 10-11 epoxy primer:
 - 1) Clean the surface with solvent, B00094 or solvent, B00151.
 - 2) Rub the surface with 320-grit (minimum) abrasive cloth, B00102 aluminum oxide paper.
 - 3) Clean the surface again with Methyl Isobutyl Ketone.

SUBTASK 51-21-94-100-001

- (3) Prepare the steel surfaces.
 - (a) Apply one layer of primer, C00259, epoxy primer on the surface.

D. Apply the Abrasion Resistant Finish

SUBTASK 51-21-94-370-001

WARNING: DO NOT GET THE FINISHES, CLEANERS, THINNERS AND SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN OR CLOTHES. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. MAKE SURE THE AIR FLOWS FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: DO NOT GET Tereco 155 ON YOUR SKIN. Tereco 155 CONTAINS DANGEROUS COMPOUNDS THAT CAN CAUSE INJURY.

- (1) Mix the abrasion resistant finish.

NOTE: The abrasion resistant finish has Tereco 155 base material (part A) and Tereco 155 accelerator (part B). Mix each component fully before you mix parts A and B together.

- (a) If you apply the finish with a medium nylon bristle brush, STD-3911:
 - 1) Add 25 parts (by weight) of part B to 100 parts (by weight) of part A.
 - 2) To make the solution thin, add 9 parts (by weight) of solvent, B00094, toluene or solvent, B00344, xylene for each 125 parts (by weight) of the finish mixture.

NOTE: The thinner is added to part B before you mix part A and B.

- (b) If you apply the finish with a spray paint spray gun with interchangeable nozzles, STD-1133:
 - 1) Add 25 parts (by weight) of part B to 100 parts (by weight) of part A.
 - 2) To make the solution thin, add 20 to 30 parts (by weight) of the toluene or xylene for each 125 parts (by weight) of the finish mixture.

NOTE: The thinner is added to part B before you mix part A and B.

- (c) Do not touch or move the mixture for a minimum of 5 minutes before you use it.
- (d) Do not use Tereco 155 with the expired pot life (Figure 701).

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- (e) Remove material with the expired pot life.
- (f) Do not mix more Tereco 155 than you can use (Figure 701).

SUBTASK 51-21-94-950-001

- (2) Apply tape or covers on areas adjacent to the work area.

SUBTASK 51-21-94-370-002

- (3) Apply the abrasion resistant finish.
 - (a) Apply one or more layers of Tereco 155 with a brush or a spray gun.
 - (b) Let the finish dry between each layer.
 - (c) Make sure the dry layer is 0.003-0.020 inch (0.076-0.508 mm) thick.
 - (d) Let the finish dry for a minimum of 8 hours at 70° ±5°F (21.1° 2.8°C) before you touch the surface or part.
 - (e) Let the finish dry for a minimum of 12 hours before flight.
 - (f) Before assembly, use the time-temperature conditions shown in Curve A to dry the finish (Figure 702).
 - (g) Before functional movement of parts, use the time-temperature conditions shown in Curve B to dry the finish (Figure 702).

CAUTION: DO NOT USE ABRASIVE PADS (SCOTH-BRITE), OR ABRASIVE PAPER ON THE ALUMINUM SURFACE UNLESS THE SCRIBE LINE INSPECTIONS WERE MADE. ABRASIVE PADS CAN SMOOTH THE ALUMINUM SURFACE AND HIDE THE SCRIBE LINE MARKS. IF YOU USE ABRASIVE PADS TO REMOVE THE PAINT OR REQUIRED TO DO REPEAT INSPECTIONS BASED ON THE SCRIBE LINE INSPECTION SERVICE BULLETIN.

CAUTION: ONLY USE APPROVED SCRAPERS ON THE AIRPLANE SKIN. SCRAPERS THAT ARE NOT APPROVED CAN MAKE SCRATCHES ON THE SKIN, AND CAUSE FATIGUE CRACKS.

- (h) Remove all of the sharp paint edges with a sealant removal tool, COM-2481.

NOTE: The shelf life of Tereco 155 is 6 months from the manufacture date.

- (i) Make sure not to cause damage to the aluminum skin.

E. Repair and Rework Damaged Surfaces

SUBTASK 51-21-94-350-001

- (1) Rework areas where it is necessary.
 - (a) Clean the surfaces (Refer to SUBTASK 51-21-94-180-001, SUBTASK 51-21-94-180-002, or SUBTASK 51-21-94-100-001).
 - (b) Apply the abrasion resistant finish (Refer to SUBTASK 51-21-94-370-001, SUBTASK 51-21-94-950-001, and SUBTASK 51-21-94-370-002).
 - (c) Remove all of the sharp paint edges with sealant removal tool, COM-2481 or other applicable tool.

SUBTASK 51-21-94-350-002

- (2) Repair the damaged areas of the abrasion resistant finish.
 - (a) Rub the surface with 280-grit (minimum) abrasive cloth, B00102 aluminum oxide paper.
 - 1) If primer primer, C00259, has scratches after this step, apply the primer again.

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- 2) Repair the aluminum surfaces that have scratches (Refer to SUBTASK 51-21-94-370-001, SUBTASK 51-21-94-950-001, SUBTASK 51-21-94-370-002, SUBTASK 51-21-94-350-001, and SUBTASK 51-21-94-350-002)
- (b) Clean the area with a wet cheesecloth that is moist with toluene.
- (c) Apply abrasion resistant finish (Refer to SUBTASK 51-21-94-370-001, SUBTASK 51-21-94-950-001, and SUBTASK 51-21-94-370-002).

————— **END OF TASK** —————

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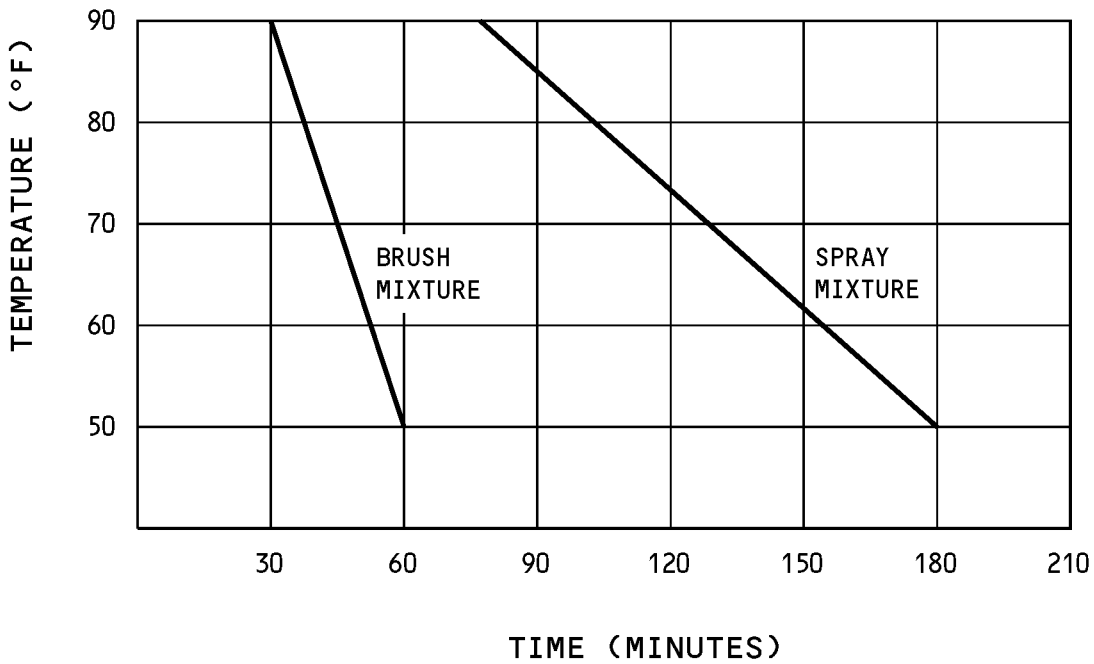
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Pot Life Tereco 115
Figure 701/51-21-94-990-801

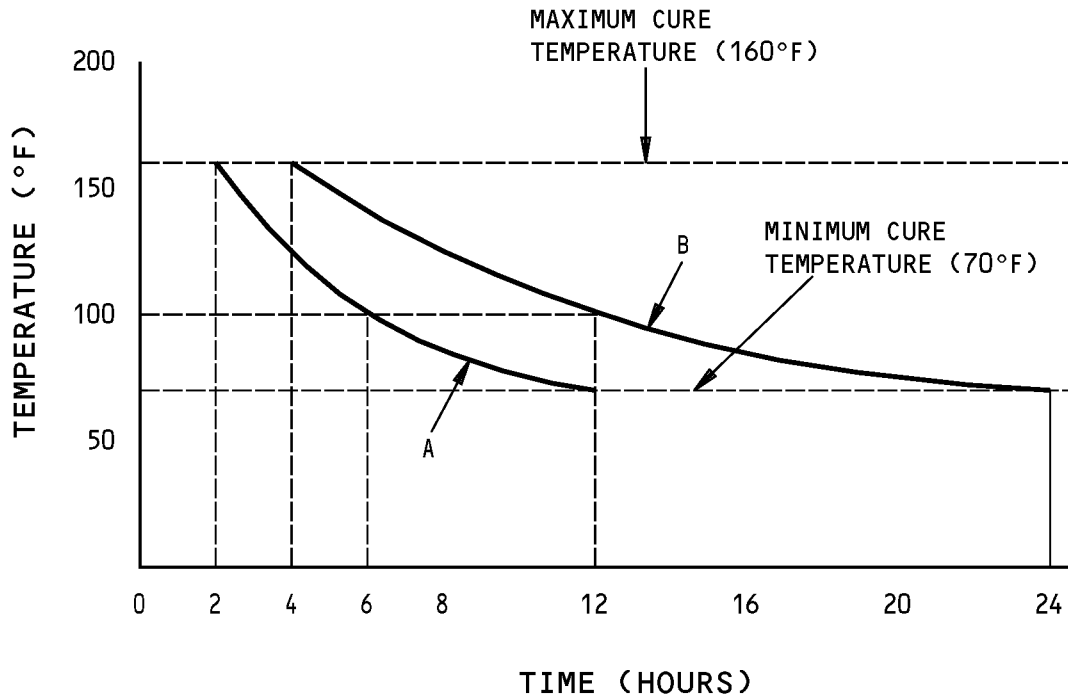
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Cure of Tereco 155
Figure 702/51-21-94-990-802

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AIRCRAFT MAINTENANCE MANUAL

SKIN AND FASTENER CORROSION REMOVAL AND CONTROL - CLEANING/PAINTING

1. General

- A. This procedure contains five tasks. The tasks are as follows:
(1) The removal of rust and corrosion
(2) The alodine treatment
(3) The application of the fastener sealant
(4) The application of the corrosion preventive paint.
B. The skin and the fastener corrosion control procedures are applicable to the areas that follow (Figure 701):
(1) The wing upper inspar surface
(2) The wing-to-body splice areas (upper and lower) that include the fasteners and the splice plates
(3) The lower skin of the wing center section that is a wall of the ram air plenum chamber.
C. There are two primer systems. The first system is the coating, C00638 wash primer with the MIL-P-8585 zinc chromate primer. The second system is the primer, C00259, and the coating, C00307 (epoxy) primer.
(1) Chemical paint strippers can remove the coating, C00638 wash primer and MIL-P-8585 zinc chromate primer to bare metal.
(2) Chemical paint strippers cannot remove the primer, C00259 and coating, C00307 primers. But, it is not necessary to remove these epoxy primers to bare metal before you can apply the finish coating.

TASK 51-21-95-100-801

2. Rust and Corrosion Removal

(Figure 701)

A. References

Table with 2 columns: Reference, Title. Row: 51-21-11 P/B 701, PAINT STRIPPING - CLEANING/PAINTING

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Table with 2 columns: Reference, Description. Row: COM-2481, Tool - Sealant Removal, BAC5000, PSD 6-184 Approved (Part #: 1-6390-A, Supplier: 63318, A/P Effectivity: 737-ALL) ... (Part #: TS1275-4, Supplier: 1DWR5, A/P Effectivity: 737-ALL)

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C. Consumable Materials

Reference	Description	Specification
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00666	Solvent - Methyl Propyl Ketone	BMS 11-9
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20, Type II
G00291	Tape - Aluminum Foil, Scotch 425	AMS-T-23397 / L-T-80

D. Procedure

SUBTASK 51-21-95-110-001

- (1) Remove corrosion preventative paint in the area where there is corrosion (PAINT STRIPPING - CLEANING/PAINTING, PAGEBLOCK 51-21-11/701).

SUBTASK 51-21-95-110-002

- (2) Remove primer, C00259 or coating, C00307 primers.
 - (a) Lightly rub the primer smooth with abrasive cloth, B00102 to the area immediately adjacent to the corrosion.

SUBTASK 51-21-95-140-001

CAUTION: DO NOT USE ABRASIVE PADS (SCOTH-BRITE), OR ABRASIVE PAPER ON THE ALUMINUM SURFACE UNLESS THE SCRIBE LINE INSPECTIONS WERE MADE. ABRASIVE PADS CAN SMOOTH THE ALUMINUM SURFACE AND HIDE THE SCRIBE LINE MARKS. IF YOU USE ABRASIVE PADS TO REMOVE THE PAINT OR REQUIRED TO DO REPEAT INSPECTIONS BASED ON THE SCRIBE LINE INSPECTION SERVICE BULLETIN.

CAUTION: ONLY USE APPROVED SCRAPERS ON THE AIRPLANE SKIN. SCRAPERS THAT ARE NOT APPROVED CAN MAKE SCRATCHES ON THE SKIN, AND CAUSE FATIGUE CRACKS.

- (3) Remove the fastener sealant with a sealant removal tool, COM-2481.

SUBTASK 51-21-95-110-003

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (4) Remove fastener sealant with solvent, B00666.

SUBTASK 51-21-95-950-001

- (5) Apply Scotch 425 Aluminum Foil Tape, G00291 to all fuel tank openings to prevent entry of grit.

SUBTASK 51-21-95-160-001

- (6) Remove rust and corrosion.
 - (a) Use a portable blaster to remove rust from fastener heads and adjacent skin area.
 - (b) Use a portable blaster to remove corrosion from the skin to an approved depth.
 - (c) As an alternative, remove rust and corrosion with a 240-grit aluminum oxide abrasive cloth, B00102 paper or cloth.

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- (d) Use a 5 to 10X magnifying glass to examine the countersunk area around the fastener heads for corrosion.

CAUTION: MAKE SURE TO REMOVE ONLY ONE ROW OF RIVETS AT A TIME IN A MORE-THAN-ONE ROW FASTENER CONFIGURATION. REPLACE THESE FASTENERS BEFORE YOU REMOVE THE FASTENERS FROM THE NEXT ROW TO PREVENT SKIN MOVEMENT. IN A ONE ROW CONFIGURATION, REMOVE AND INSTALL EACH SECOND FASTENERS.

- (e) Remove the fasteners with corrosion in the countersunk area.
- (f) Remove the corrosion from the fastener to an approved depth.

————— **END OF TASK** —————

TASK 51-21-95-300-801

3. Alodine Treatment Application

A. References

Reference	Title
20-40-11 P/B 201	AIRPLANE GROUNDING - MAINTENANCE PRACTICES
51-21-31-350-801	Removal and Control of Corrosion for Aluminum and Aluminum Alloys (P/B 701)

B. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle

C. Consumable Materials

Reference	Description	Specification
C00064	Coating - Aluminum Chemical Conversion	BAC5719, Type II, Class A (MIL-C-5541, Class A)

D. Prepare the Surface for treatment

NOTE: Use coating, C00064.

NOTE: It is not necessary to clean all areas for alodine treatment. Only clean the areas where skin or fasteners are open to the base metal during the removal of rust and corrosion.

SUBTASK 51-21-95-580-001

- (1) Park the airplane away from the sun and electrically ground (AIRPLANE GROUNDING - MAINTENANCE PRACTICES, PAGEBLOCK 20-40-11/201).

SUBTASK 51-21-95-160-002

- (2) Clean the surface correctly to get a satisfactory coating, C00064 treatment.

WARNING: DO NOT GET THE FINISHES, CLEANERS, THINNERS AND SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN OR CLOTHES. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. MAKE SURE THE AIR FLOWS FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME AND HEAT.

- (a) Prepare the solution as follows:

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- 1) Use one part (by volume) solvent alkaline cleaner to two parts water and five to six parts BMS 3-2 Type I solvent.
- (b) Apply the cleaner solution and let it soak for a minimum of 10 minutes.
- NOTE: The solution must be wet on the skins. Apply the cleaner again if it is necessary.
- (c) Clean the skins with a soft bristle brush, STD-123.
 - 1) Make sure to clean the countersunk areas and around the rivet heads.
- (d) Flush the surface with water (100°F maximum) (37.8°C) at high pressure.
- (e) Examine the surface for water breaks.

NOTE: A surface with no water breaks has a continuous layer of water for a minimum of 30 seconds.

- (f) Clean the skin again if there are water breaks.

E. Apply the coating treatment

NOTE: Use coating, C00064.

SUBTASK 51-21-95-370-001

- (1) Apply the coating, C00064 treatment with a soft bristle brush, STD-123.
 - (a) Apply the coating, C00064 treatment to all steel fastener heads and adjacent bare aluminum skin surfaces, do this task: Removal and Control of Corrosion for Aluminum and Aluminum Alloys, TASK 51-21-31-350-801.

————— **END OF TASK** —————

TASK 51-21-95-300-802

4. Fastener Sealant Application

A. References

Reference	Title
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-449	Gun - Sealant
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic
STD-1053	Knife - Putty, Broad Blade

C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
A00767	Sealant - Fuel Tank	BMS5-45
B00090	Solvent - Inhibited Trichloroethane 1,1,1	MIL-T-81533
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00153	Solvent - Toluene, Nitration	JAN-T-171, Grade A
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92/201) - Series 92	

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Reference	Description	Specification
C00064	Coating - Aluminum Chemical Conversion	BAC5719, Type II, Class A (MIL-C-5541, Class A)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00363	Abrasive - Coated Cloth, Crocus	ANSI B74.18

D. Apply the Fastener Sealant

SUBTASK 51-21-95-110-004

(1) Clean the fasteners.

- (a) Remove the lubricant before the installation of solvent, B00148 or solvent, B00090.

SUBTASK 51-21-95-110-005

(2) Clean the countersunk and other rework areas.

WARNING: DO NOT GET THE FINISHES, CLEANERS, THINNERS AND SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN OR CLOTHES. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. MAKE SURE THE AIR FLOWS FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME AND HEAT.

- (a) Remove the lubricant and other soil with a clean, moist cotton wiper, G00034 that contains solvent, B00184.
- (b) Dry the surfaces before the fastener and sealant installation.

SUBTASK 51-21-95-390-001

(3) Prepare the sealant.

- (a) Refer to the manufacturer's instructions to mix the sealant.
- (b) Mix the sealants as follows:

NOTE: The life of P/S 890 Class A and Class B is 1/2 or 2 hours. The life of PR 1432 is 1 hour. Mix only the quantity that you can use during the life of the sealant.

- 1) sealant, A00767 - 1 part A (accelerator) to 10 parts B (base)
- 2) sealant, A00767 - 1 part A (accelerator) to 7-1/2 parts B (base)
- 3) sealant, A00247 - 1 part A (accelerator) to 15 parts B (base)

SUBTASK 51-21-95-390-002

(4) Apply sealant, A00767.

- (a) Apply a small drop of the mixture to the countersunk area or below the head of the fastener.
- (b) Install the fastener immediately.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (c) Remove all unwanted sealant with clean cotton wiper, G00034 that is wet with Series 92 solvent, B01012 (TASK 20-30-92-910-801).

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SUBTASK 51-21-95-390-003

- (5) Apply sealant, A00767 sealant.
- Use a brush to apply the sealant, A00767 sealant mixture to the rework area.
 - Make sure you apply the sealant into the cracks around the fastener.
- NOTE:** It is necessary to have a continuous layer of sealant on the rework surface.

SUBTASK 51-21-95-390-004

- (6) Apply sealant, A00767 on top of the sealant, A00767.
- Use a sealant gun, STD-449 or a hardwood or plastic fillet smoothing spatula, STD-810 to apply the sealant to the rework areas.
 - If the sealant, A00767 is easy to apply, do these steps:
 - Apply the sealant until the surface of the sealant is not far below the surface of the adjacent wing.
 - Use a hardwood or plastic fillet smoothing spatula, STD-810 or a duckbill nozzle to remove the unwanted sealant.
 - Use a hardwood or plastic fillet smoothing spatula, STD-810 to get the air bubbles out of the sealant.
 - If sealant, A00767 is not easy to apply, do these steps:
 - Apply a thick layer of sealant, A00767.
 - Make sure the sealant surface is above the contour of the wing surface.
 - Let the sealant dry.
 - Use a broad blade putty knife, STD-1053 to remove the unwanted sealant that is above the wing surface.

SUBTASK 51-21-95-390-005

- (7) Apply sealant, A00247.
- NOTE:** Use PR 1432 sealant only for areas with many holes.
- Use a usual spray equipment to apply the sealant, A00247.

NOTE: For a best result, use a spray gun with an orifice diameter of 0.085 inch (2.159 mm) minimum.
 - Use atomizing pressure of approximately 35 psig (241 kPa).
 - Fully fill the rework areas with sealant, A00247 until the sealant extends higher than the edge.
 - Feather the surface.
 - If sealant, A00247 is not easy to apply, do these steps:
 - Add 10 percent of solvent, B00153 (by volume) to the base material.
 - Mix the solution.
 - Add the accelerator.
 - Constantly mix the base and the accelerator to decrease the spray life to 1/4 hour.
 - Keep the remaining life mixture of 1 hour in a cold box at 50°F (10°C).

SUBTASK 51-21-95-390-006

- (8) Let the sealant dry as follows:

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Table 701/51-21-95-993-801

Temperature	Relative Humidity	Time
75°F 23.9°C	50%	72 Hours
120°F 48.9°C	50%	18 Hours

SUBTASK 51-21-95-140-002

- (9) Lightly rub the sealant smooth with a fine abrasive cloth, B00102 sandpaper, abrasive cloth, G00363 cloth (aluminum oxide grit) or a gum rubber buffing wheel.

SUBTASK 51-21-95-350-001

- (10) Repair the damaged coating, C00064 if it is necessary.

END OF TASK

TASK 51-21-95-300-803

5. Corrosion Preventive Paint Application

(Figure 702)

A. General

- (1) The corrosion control treatment contains the steps to apply the primer before you apply the EC-843 or EC-843S Corogard or Aeroflex.
- (2) On surfaces that paint stripper can remove to bare metal, apply coating, C00638 wash primer and MIL-P-8585 zinc chromate primer.
- (3) On surfaces that paint stripper cannot remove to bare metal, apply primer, C00259.

B. References

Reference	Title
20-30-84-910-801	Final Cleaning of Metal Prior to Painting (Series 84) (P/B 201)
51-21-21-100-801	Clean the Surface to be Painted (P/B 701)
51-21-21-370-801	Prepare the Surface to be Painted (P/B 701)
51-21-99-300-802	Decorative Exterior Paint System Repair (P/B 701)

C. Consumable Materials

Reference	Description	Specification
B00068	Alcohol - Ethyl (Denatured)	AMS 3002F (MIL-E-51454, Type II)
B00083	Solvent - Aliphatic Naphtha (For Acrylic Plastics)	TT-N-95 Type II, ASTM D-3735 Type III
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00342	Alcohol - N-Butyl (Butanol)	ASTM D304
B01004	Solvent - Final Cleaning Of Metal Prior To Painting (AMM 20-30-84/201) - Series 84	
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20, Type II
C00638	Coating - Metal Pretreatment, Resin-Acid	MIL-C-8514

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Reference	Description	Specification
C00662	Thinner - C25/90S	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

D. Prepare the Surface

SUBTASK 51-21-95-370-002

- (1) On surfaces that paint stripper can remove to bare metal, do these steps immediately before you apply the primer:

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (a) Use a clean cotton wiper, G00034 that is moist with Series 84 solvent, B01004 (TASK 20-30-84-910-801).
- (b) When the cotton wiper, G00034 gets dirty, change to a clean cotton wiper, G00034.
- (c) Dry the surface with a clean, dry cotton wiper, G00034.

SUBTASK 51-21-95-390-007

- (2) On surfaces with primer, C00259 and coating, C00307 primer (cannot remove with paint stripper), prepare the surface as follows:

- (a) Do this task: Clean the Surface to be Painted, TASK 51-21-21-100-801.
- (b) Do this task: Prepare the Surface to be Painted, TASK 51-21-21-370-801.

E. Apply the Wash Primer (Apply to bare surfaces)

NOTE: Use coating, C00638.

SUBTASK 51-21-95-370-003

WARNING: DO NOT GET THE FINISHES, CLEANERS, THINNERS AND SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN OR CLOTHES. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. MAKE SURE THE AIR FLOWS FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME AND HEAT.

- (1) Mix the wash primer.
 - (a) Shake the base material and the acid accelerator fully before you mix the primer solution.

NOTE: The wash primer has two components, a resin base material (4 parts by volume) and an acid accelerator (1 part by volume).
 - (b) Slowly add a small quantity of the acid accelerator to the base material.

NOTE: Do not add the base material to the acid accelerator.
 - (c) Fully mix the mixture manually.
 - (d) Continuously mix the mixture when you add the remaining quantity of the acid accelerator.
 - (e) Identify the container with a label.

- 1) Write the date and hour when the mixture was mixed and when the pot life comes to an end.

NOTE: The wash primer mixture has a pot life of 4 hours less than 90°F (32.2°C) and 2 hours more than 90°F (32.2°C).

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- (f) Do not touch the wash primer mixture for a minimum of 15 minutes before you use it.
- (g) Use equal quantity of alcohol, B00068 and alcohol, B00342 alcohol to make the wash primer mixture thin.

NOTE: The volume of ethyl/butyl alcohol mixture must not be more than two times the volume of the acid accelerator used.

SUBTASK 51-21-95-370-004

- (2) Apply the coating, C00638 wash primer.
 - (a) Clean the spray equipment before you use it.
 - (b) Make sure to flush the equipment with alcohol before and after you use it.
 - (c) Apply one layer of the coating, C00638 wash primer with the spray equipment.
 - (d) Make sure the continuous thickness of the layer is 0.2-0.4 mils.
 - 1) If the layer is too thick, do these steps:
 - a) Immediately remove the primer with alcohol.
 - b) Apply the coating, C00638 wash primer again to get the correct thickness.
 - (e) Let the coating, C00638 wash primer dry for not less than 45 minutes and not more than 4 hours at 65-85°F (18.3-29.4°C).
 - 1) If you let the primer dry for more than 4 hours, do these steps:
 - a) Remove the primer with alcohol, B00342 or paint stripper.
 - b) Apply a new layer of primer.

CAUTION: BE CAREFUL WHEN YOU USE BUTYL ALCOHOL TO CLEAN THE PRIMER. BUTYL ALCOHOL WILL REMOVE THE PRIMER IF YOU DO NOT USE IT CORRECTLY.

- (f) Use varnish or linseed oil rags, or a lightly wet rags with alcohol, B00342 to clean the primer.
- (g) Carefully remove dust, dirt or unwanted paint from the primer.
- (h) Rub a 400-grit abrasive cloth, B00102 paper (minimum) on the wash primer to get a smooth surface.

NOTE: Be careful not to remove the wash primer.

F. Apply Zinc chromate primer MIL-P-8585 (Apply to surfaces with wash primer)

SUBTASK 51-21-95-370-005

- (1) Mix the zinc chromate primer.
 - (a) Add thinner to the primer to make the mixture smooth and constant.
 - 1) Slowly add 2 to 2.5 parts (by volume) of toluene to 1 part (by volume) of primer.

SUBTASK 51-21-95-370-006

- (2) Apply the zinc chromate primer.
 - (a) Apply the zinc chromate primer with a spray gun until the thickness of the layer is 0.2-0.4 mils.
 - (b) Let the zinc chromate primer dry at 65-85°F (18.3-29.4°C) for not less than 45 minutes and not more than 72 hours.
 - 1) If after 72 hours and you do not apply the Corogard or Aeroflex, do these steps:
 - a) Remove the primer.
 - b) Apply a new layer of the wash primer and the zinc chromate primer to the surface.

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- (c) Rub the dry zinc chromate primer lightly with a 400 grit (minimum) abrasive cloth, B00102 paper to get a smooth surface.
 - (d) Clean the surface with a clean cotton wiper, G00034 that is moist with BMS 3-2 solvent and solvent, B00083.
- G. Apply the BMS 10-11, Type 1 primer (Apply to surfaces with epoxy primer and did not remove with paint stripper).
- SUBTASK 51-21-95-370-007
- (1) Apply primer, C00259.
 - (a) Do this task: Decorative Exterior Paint System Repair, TASK 51-21-99-300-802.
- SUBTASK 51-21-95-370-008
- (2) Let the primer, C00259r dry before you apply Corogard or Aeroflex.
- H. Apply the Corogard EC-843 or EC-843S (Optional)

SUBTASK 51-21-95-370-009

WARNING: MAKE SURE YOU KEEP THE MIXTURE OF COROGARD AND ALUMINUM POWDER IN THE CORRECT CONTAINER IF YOU DO NOT USE IT IMMEDIATELY. WHEN YOU MIX THE COROGARD WITH THE ALUMINUM POWDER, IT RELEASES FLAMMABLE HYDROGEN GAS. KEEP THE MIXTURE IN AN OPEN CONTAINER OR A CONTAINER WITH OPENINGS ON THE COVER. FAILURE TO DO THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Prepare the Corogard EC-843 and EC-843-S.

NOTE: Corogard EC-843 and EC-843-S have two components, the resin component and the aluminum powder component (12.5 ounces (0.37 liter) aluminum powder EC-1101 for each gallon (3.8 liters) of resin EC-843, or 9.0 ounces (0.27 liter) aluminum powder EC-1101 for each gallon (3.8 liters) of resin EC-843-S).

- (a) Put the resin component through a 60-80 mesh metal sieve into a pressure pot or a mixer.
- (b) Put the aluminum powder component in a different container from the resin component.
- (c) Slowly add the methyl isobutyl ketone or the butyl acetate to make the mixture smooth and constant.
- (d) Put the aluminum powder through the 60-80 mesh metal sieve into the pressure pot or mixer.
- (e) Fully mix the mixture manually or with a power mixer.
- (f) Make sure the mixture is smooth and constant.
- (g) Use one of these materials to make the mixture thin for airspray:

NOTE: The thinner must not be more than 20 percent (by volume) of the base material.

- 1) Methyl isobutyl ketone
 - 2) Butyl acetate
 - 3) Five parts methyl isobutyl ketone (by volume) to three parts butyl acetate (by volume)
 - 4) One part methyl isobutyl ketone (by volume) to one part butyl acetate (by volume).
- (h) The pot life of this material is 16 hours with no temperature limit.

SUBTASK 51-21-95-370-010

- (2) Apply the Corogard EC-843 or EC-843S.
 - (a) Apply one layer of the EC-843 or EC-843S Corogard mixture with a spray gun.
 - 1) Frequently shake the mixture in the pot.

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- (b) Between the first and subsequent layers, stop for a minimum of 30 minutes before you apply a new layer.

NOTE: On some surfaces, it is not necessary to let the mixture dry before you can apply a second layer. For example, horizontal surfaces where there is no runs or sags.

- (c) Apply sufficient layers to get a total dry thickness of 2-3 mils.

NOTE: To decrease the effect of bronzing, the Corogard EC-843 and EC-843-S material has more pigments than usually necessary. The aluminum pigments can rub off but the quality of the Corogard EC-843 and EC-843-S does not decrease.

- (d) Dry the mixture for a minimum of 24 hours at 65 to 85°F (18.3-29.4°C).

NOTE: The dry time can decrease if you apply heat on the surface at 125 (± 5)°F (51.7 ± 2.8°C) for 2 hours.

I. Apply the Aeroflex G12E25 Coating (Preferred)

SUBTASK 51-21-95-370-011

(1) Prepare the aluminized coating Aeroflex G12E25.

- (a) Fully mix the Aeroflex G12E25 material for 10-15 minutes manually or use a power mixer.

NOTE: There must be no air bubbles while you mix the Aeroflex.

- (b) Make sure that the aluminum pigment is constant in the mixture.

- (c) Use the Aeroflex thinner to make the mixture thin.

NOTE: The thinner must not be more than 20 percent (by volume) of the base material.

- (d) The pot life of this mixture is 4 hours with no temperature limit.

SUBTASK 51-21-95-370-012

(2) Apply the Aeroflex G12E25.

- (a) Apply primer, C00259 and coating, C00307 primer on the surface.

- (b) Let the primer dry before you apply the mixture.

- (c) Put the Aeroflex mixture through a clean cloth or sieve.

- (d) Apply the Corogard mixture with a spray gun.

- (e) Add sufficient layers to get a total dry thickness of 2-3 mils (0.002 to 0.003 inch) (0.051-0.076 mm).

NOTE: If the mixture becomes dry when you use Aeroflex G12E25, decrease the atomizing air pressure. You can also add the C25/90S thinner, C00662 to make the mixture thin as an alternative.

- (f) Dry the mixture at 65-85°F (18.3-29.4°C) for a minimum of 4 hours before you move the airplane to an open area.

- (g) Dry the mixture for 24 hours before flight.

NOTE: The dry time can decrease if you apply heat on the surface at 125 ± 5°F (51.7 ± 2.8°C) for 2 hours.

J. Repair and Rework

SUBTASK 51-21-95-350-002

(1) Clean areas with small damages such as scratches and gouges.

- (a) Rub the areas smooth with 280 grit (minimum) abrasive paper.

- (b) Clean the areas with clean rags moist with toluene or xylene.

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SUBTASK 51-21-95-370-013

- (2) Apply the primer and Aeroflex or Corogard.
 - (a) Feather all the edges.
 - (b) Use a brush for small damages.

SUBTASK 51-21-95-350-003

- (3) Clean areas with EC-843 or EC-843S Corogard or Aeroflex applied.
 - (a) Fully clean the areas with toluene or xylene.
 - (b) Rub the areas smooth with 280 grit (minimum) abrasive paper.
 - (c) Clean the areas again with rags that are moist with toluene or xylene.
 - (d) Rub the surface dry with a clean cloth.

SUBTASK 51-21-95-220-001

- (4) Make sure the repair and overlap thickness is not more than 5.0 mils.

NOTE: The color of the new EC-843 and EC-843S Corogard coating will not be the same as the adjacent surface. The color will become the same in approximately 60 days. Permit the coating to dry a minimum of 4 hours at 65-85°F (18.3-29.4°C).

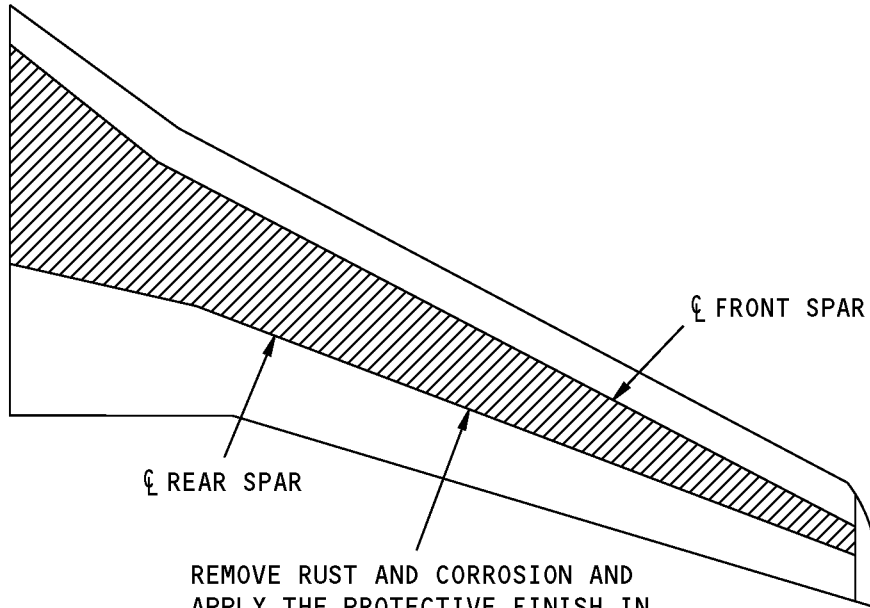
————— **END OF TASK** —————

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REMOVE RUST AND CORROSION AND
APPLY THE PROTECTIVE FINISH IN
THE SHADED AREA SHOWN. DO NOT
APPLY FINISH TO THE PAINTED
SURFACES

WING PLAN VIEW

**Skin and Fastener Corrosion Control Location
Figure 701/51-21-95-990-801**

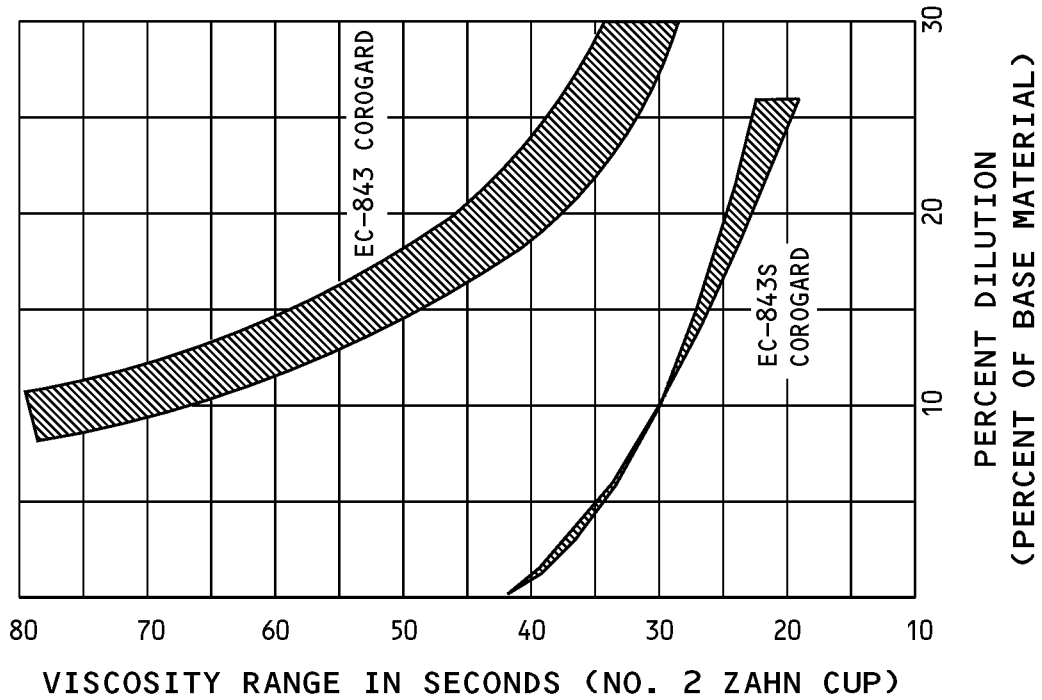
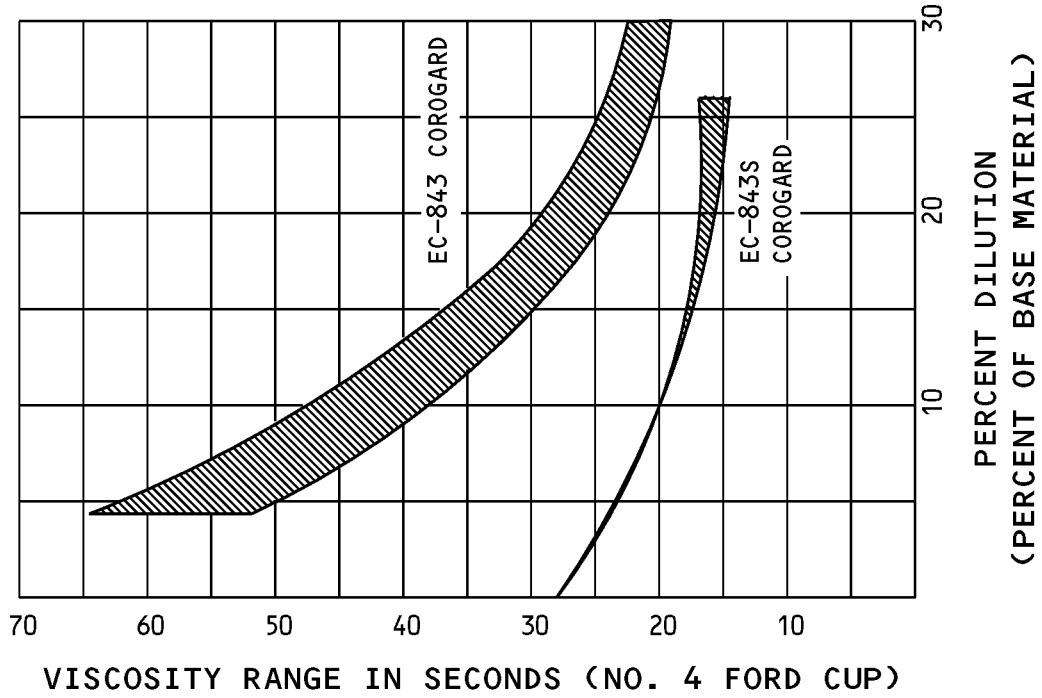
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**Corogard Viscosity
Figure 702/51-21-95-990-802**

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HIGH TEMPERATURE COATING (TITANIUM) - CLEANING/PAINTING

1. General

A. This procedure contains two tasks. The first task is to apply the high temperature (titanium) coating (B2000 paint, C00018). The second task is to apply the BMS 10-82 coating, C00314.

TASK 51-21-96-300-801

2. High Temperature (Titanium) Coating

A. Consumable Materials

Reference	Description	Specification
B00722	Solvent - Stoddard	MIL-PRF-680 Type I or II (Supersedes P-D-680, Type I or II)
E00003	Stripper - Paint - Turco 4338	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

B. Prepare the Surface

SUBTASK 51-21-96-150-001

CAUTION: DO NOT SAND BLAST TITANIUM DUCTS. IF YOU SAND BLAST THE TITANIUM DUCTING, YOU CAN CAUSE PERMANENT DAMAGE.

(1) Use sand blast equipment to remove contamination and high temperature coating from parts that are on the airplane.

(a) Make sure that no sand particles get on the adjacent surfaces.

SUBTASK 51-21-96-950-001

(2) Remove the titanium parts from the airplane if you use paint strippers to remove the high temperature coating.

SUBTASK 51-21-96-960-001

(3) Replace all parts that have metal corrosion.

SUBTASK 51-21-96-150-002

(4) Remove the hydraulic fluid contamination:

NOTE: A light glossy brown layer, a black layer that is not shiny, or a bare surface, are signs of hydraulic fluid (Skydrol) contamination. A flat, black inorganic finish supplies protection for titanium parts in areas with possible contamination to hydraulic fluid. Make sure you know the difference between the black inorganic finish and the hydraulic fluid contamination.

(a) Clean the parts with a cotton wiper, G00034 or an aluminum wool that is moist with Oakite 61.

NOTE: The aluminum wool must be sufficiently rough to get a surface that is not shiny.

(b) Flush the parts with water.

(c) Dry the parts with a clean dry cotton wiper, G00034.

(d) Clean the parts again until you get a surface with no water breaks.

SUBTASK 51-21-96-110-001

(5) Remove all the remaining unwanted material:

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- (a) Fully flush the area with water.

NOTE: If it is possible, use high pressure water to flush the area.

- (b) Clean the area with solvent, B00722.
- (c) Flush the area with water until you get a surface with no water breaks.
- (d) Dry the surface with a clean dry cotton wiper, G00034.

SUBTASK 51-21-96-150-003

- (6) Remove the high temperature coating:

WARNING: DO NOT TOUCH OR HOLD TURCO 4338 WITHOUT THE NECESSARY PROTECTION. WEAR GOGGLES AND HEAVY RUBBER GLOVES. KEEP THE TURCO 4338 IN STEEL CONTAINERS. DO NOT MIX TURCO 4338 POWDER WITH ORGANIC SOLVENTS SUCH AS ACETONE OR METHYL ETHYL KETONE. A MIXTURE OF TURCO 4338 WITH THE ORGANIC SOLVENTS CAN CAUSE AN EXPLOSION AND INJURY TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Refer to the manufacturer's instructions to prepare the Turco 4338 stripper, E00003 solution.
- (b) Put the parts in the stripper solution for 30 to 40 minutes.
- (c) Remove the parts from the stripper solution.
- (d) Fully flush the parts with water.
- (e) Use an air water spray to remove all unwanted materials.
- (f) Clean the parts again until you remove the black coating.

C. Apply the High Temperature Coating

SUBTASK 51-21-96-370-001

CAUTION: DO NOT APPLY THE HIGH TEMPERATURE COATING IN AN AREA THAT CONTAINS OTHER SOLVENTS IN THE AIR. THESE OTHER SOLVENTS CAN CAUSE AN UNSATISFACTORY BOND FOR THE HIGH TEMPERATURE COATING.

CAUTION: DO NOT SHAKE THE HIGH TEMPERATURE COATING. IF YOU SHAKE THE HIGH TEMPERATURE COATING, THE COATING WILL HAVE UNWANTED AIR BUBBLES.

- (1) Slowly add distilled or deionized water to the high temperature coating.

SUBTASK 51-21-96-370-007

- (2) Continuously mix the mixture while you add the distilled or deionized water.

SUBTASK 51-21-96-370-003

- (3) Apply the high temperature coating with a brush or a spray gun.

- (a) Make sure the coating is 0.8 to 1.2 mils (0.0008 to 0.0012 inch) (0.0203-0.0012 mm) thick when it is dry.

SUBTASK 51-21-96-370-004

- (4) Let the coating dry for 1 hour (minimum) at 70-90°F (21.1-32.2°C).

SUBTASK 51-21-96-370-005

- (5) Put the parts in an oven for 1 hour (minimum) at 350 ± 25°F (176.7 ± 13.9°C).

NOTE: If damage to the coating occur while it is in the oven, increase the dry time of the coating.

————— END OF TASK —————

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TASK 51-21-96-300-802

3. BMS 10-82 Coating Application

A. Consumable Materials

Reference	Description	Specification
B00153	Solvent - Toluene, Nitration	JAN-T-171, Grade A
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
C00314	Coating - Low Emissivity Gold Coating	BMS10-82, Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G01306	Gloves - Lint-free	

B. Prepare for the Coating Application

SUBTASK 51-21-96-150-004

CAUTION: MAKE SURE THAT THE TITANIUM SURFACE IS CLEAN. DO NOT LET SALT FALL ON THE SURFACE. DO NOT TOUCH THE SURFACE. USE CLEAN WHITE COTTON GLOVES. SALT AND FINGERPRINTS CAN CAUSE CORROSION ON THE SURFACE.

- (1) Use clean lint-free gloves, G01306 to hold the parts to prevent contamination.

SUBTASK 51-21-96-150-005

- (2) Remove the protective coating from these parts.

SUBTASK 51-21-96-210-001

- (3) Examine all the parts for hydraulic fluid contamination.
 - (a) Use a abrasive mat, G00251 sheet to remove soil and stain.
 - (b) Remove unwanted material with solvent, B00184 or solvent, B00153 solvent.

SUBTASK 51-21-96-100-001

- (4) Dry the parts with a clean dry cotton wiper, G00034.

C. Procedure

SUBTASK 51-21-96-370-006

- (1) Apply the coating, C00314.
 - (a) Fully mix the coating, C00314 manually.
 - (b) Use a spray gun to apply the coating, C00314.
 - 1) Use an atomizing pressure of 10 to 25 pounds (44-111 newtons).
 - (c) Let each layer of the coating dry for 5 to 10 minutes.
 - (d) Apply the coating, C00314 until you get a red, transparent, constant layer with no runs or sags.
 - (e) Put the parts in an oven immediately after you apply the coating, C00314.
 - (f) Keep the parts in the oven for 10 to 15 minutes at a temperature of 825 (±25)°F.

NOTE: The oven must have an opening to let out smoke and fumes.
 - (g) Make sure the coating has a tightly bonded yellow gold layer that is smooth and constant.

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SUBTASK 51-21-96-550-001

(2) Prevent the parts from damage and contamination until installation.

————— **END OF TASK** —————

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NON-SKID FINISH - CLEANING/PAINTING

1. General

- A. This procedure contains two tasks:
 - (1) Apply the Overwing Emergency Walkway Coating.
 - (2) Apply the Epoxy Walkway Coating to the Bulk Cargo Entryway.
- B. The Non-Skid finish can be applied to the epoxy primers that follow:
 - (1) BMS5-89,
 - (2) BMS10-11,
 - (3) BMS10-20, or
 - (4) BMS10-79.
- C. Before the Non-Skid surface is applied, clean the surface and reactivate it.
- D. Some of the recommended equipment that can be used to apply the Overwing Emergency Walkway Coating finish is as follows. You can get equivalent equipment.
 - (1) High Volume Low Pressure (HLVP) gravity feed or pressure assist cup spray gun with a 0.070 inch fluid nozzle or larger.
- E. Some of the recommended equipment that can be used to apply the Epoxy Walkway Coating finish is as follows. You can get equivalent equipment.
 - (1) Preferred - Binks model 7 spray gun with a No. 38-PD air cap, No. 38 fluid tip, and No. 38 needle (for grit-containing material only).
 - (2) Optional - Binks Model 18 spray gun with a No. 60 or 65 fluid tip.
 - (3) Equipment for spraying the dry pumice only - Binks Model 171 spray gun with a No. 58-11 tip.
- F. Use clean, solvent resistant container for mixing. Metal, polyethylene, and polypropylene containers are recommended. Do not use containers (i.e. coated and uncoated paper cups) which will contaminate the paint.
- G. Do not mix resin materials that are almost the same, or materials from different suppliers.
- H. The preferred temperature to apply the non-skid material is 50°F to 100°F (10-38°C) and relative humidity less than 85 percent.

TASK 51-21-97-370-802

2. Apply the Overwing Emergency Walkway Coating

A. References

Reference	Title
20-30-85-910-801	Final Cleaning of All Organic Coatings Prior to Painting (Series 85) (P/B 201)
51-21-99-300-802	Decorative Exterior Paint System Repair (P/B 701)

B. Tools/Equipment

Reference	Description
STD-1133	Gun - Spray, Paint, with Interchangeable Nozzles

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C. Consumable Materials

Reference	Description	Specification
A50193	Sealant - Pressure And Environmental-Chromate (For Spray Application As A Primer)	BMS 5-95 Type I, Class F
B00083	Solvent - Aliphatic Naphtha (For Acrylic Plastics)	TT-N-95 Type II, ASTM D-3735 Type III
B00094	Solvent - Toluene	A-A-59107
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00151	Solvent - Methyl Isobutyl Ketone	ASTM D1153
B01000	Solvent - General Cleaning Of Metal (AMM 20-30-801/201) - Series 80	
B01005	Solvent - Final Cleaning Of All Organic Coatings Prior To Painting (AMM 20-30-85/201) - Series 85	
C50018	Coating - Semigloss, Urethane, White (Desothane HS) - CA8022/B7022	BAC5705, Type 1
C50019	Coating - Flat, Urathane, Black (Desothane HS) - CA8012/B701	BAC5705, Type 1
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)
G50123	Rag - Epoxy Coated Tack Rag - C-60	
G50124	Compound - Pumice, Grade 1/2 - Navajo Brand	

D. Prepare the Surface

SUBTASK 51-21-97-110-001

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, IN YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE SOLVENTS. KEEP SOLVENTS AWAY FROM SPARKS, FLAME, AND TEMPERATURES ABOVE THE FLASH POINT. SOLVENT ARE A POISONOUS AND FLAMMABLE MATERIAL WHICH CAN CAUSE INJURY PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this step to prepare the surfaces that have a coat of primer less than 48 hours old:
 - (a) Clean the surface with clean cotton wiper, G00034 moist with solvent solvent, B00083 or solvent, B00094.
 - (b) If the surface has particle contamination only, clean with a C-60 rag, G50123.

SUBTASK 51-21-97-100-001

- (2) Do this step to prepare the surfaces that have a coat of primer more than 48 hours old:
 - (a) Clean the surface with clean cotton wiper, G00034 moist with solvent solvent, B00151.
 - (b) Rub the surface lightly with abrasive cloth, B00102 100-grit minimum.
 - (c) Clean the surface with clean cotton wiper, G00034 moist with solvent solvent, B00083 or solvent, B00094 to remove sanding particles.
 - (d) Clean the surface with a C-60 rag, G50123 to remove remaining particles.

SUBTASK 51-21-97-370-008

- (3) If the primer is removed and aluminum shows, do this task: do this task: Decorative Exterior Paint System Repair, TASK 51-21-99-300-802.

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SUBTASK 51-21-97-950-001

- (4) Apply Scotch Flatback Masking Tape 250, G00270 on the adjacent areas.

E. Mix the materials

SUBTASK 51-21-97-390-002

- (1) Make sure the container used for mixing is clean and solvent-resistant.
- (2) Agitate the sealant, A50193 base material prior to thinning or catalyzing.
- (3) The mix ratio (by volume) is 100/6.9.
 - (a) The maximum allowable deviation from the ratio is +/- 5 percent.
- (4) Slowly add the catalyst.
 - (a) Agitate the base material while adding the catalyst.
- (5) If the material needs to be thinned, slowly add the thinner.
 - (a) Agitate the mixture while adding the thinner.
 - (b) Thin the spray by adding 20 to 30 percent Series 80 solvent, B01000.
- (6) Immediately apply the mixture using the High Volume Low Pressure (HVLP) spray gun.

NOTE: Catalyzed Type 46 mixture has a pot life of 1.5 hours at 75°F (24°C). If the material has exceeded this limit, discard the mixture.

- (a) Make sure the material has the properties that follow:
 - 1) Homogenous
 - 2) Free of skins
 - 3) Free of lumps
 - 4) Free of gelled or coarse particles
- (b) Allow it to dry for a minimum of 2 hours before overcoating.
- (c) Make sure the dry film thickness is 2 mils (0.051 mm) to 3 mils (0.076 mm) thick.

F. Apply the Non-Skid Finish

SUBTASK 51-21-97-370-009

- (1) Prepare the non-skid finish.
 - (a) Mix the CA8022/B7022 coating, C50018 or CA8012/B701 coating, C50019 according to the manufacturers instruction.

NOTE: The pot life for the mixture is 3.5 hours for the white mixture and 2.5 hours for the black mixture.
 - (b) While continuing mixing the coating, add 0.30 lb (0.14 kg) of Navajo Brand compound, G50124 to one gallon (3.8 liters) of mixed coating.

NOTE: Addition of Navajo Brand compound, G50124 to the black coating is optional when the black coating is applied directly over the white coating containing pumice.
 - (c) Hand swirl mixture just before application.
 - 1) This is to make sure the mixture is applied evenly.

SUBTASK 51-21-97-370-010

- (2) Apply the pumice and enamel mixture with a spray paint spray gun with interchangeable nozzles, STD-1133 as follows:

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- (a) Apply one or more layers of the nonskid finish making sure that the dry thickness is between 0.005 to 0.007 inches (0.127-0.177 mm) (6 to 8 ounces (0.170-0.226 kg) for each square yard (8361 centimeters square).

NOTE: The dry thickness is the distance from the primer to the external surface.

- 1) Let each layer of coating dry for 15 minutes (minimum) at 50°F or 10 minutes at 70°F or more.

CAUTION: ANY MASKING TAPE ADJACENT TO THE OVERWING EMERGENCY EXIT WALKWAY COATING EDGE SHOULD BE PULLED BEFORE THE COATING IS THOROUGHLY DRY SO THAT REMOVAL OF THE COATING IS AVOIDED.

- (b) Carefully remove the masking tape before the layers are fully dry.
 - 1) Let the coating air dry for a minimum of 2 hours before removing the masking tape
- (c) Air dry the coating for 4 hours (minimum) of 90°F (32°C) before walking on the surface
- (d) Air dry the coating for 24 hours at 70°F (21°C) before service.

G. Repair the Nonskid Surface (Small Damaged Areas)

SUBTASK 51-21-97-160-002

- (1) Prepare the area to be repaired as follows:

NOTE: Repair of damages that are less than 10 percent of the coated area.

- (a) Remove loose material.
- (b) Rub the surface smooth with 100-grit or finer abrasive cloth, B00102.
- (c) Smooth and feather the paint edges with 100-grit or finer abrasive cloth, B00102.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (d) Clean the surface with a clean cotton wiper, G00034 that is moist with Series 85 solvent, B01005 (TASK 20-30-85-910-801).
- (e) Use a clean cotton wiper, G00034 to make sure the surface is fully dry.
- (f) Use a C-60 rag, G50123 if it is necessary to remove unwanted materials.

SUBTASK 51-21-97-370-011

- (2) To apply nonskid finish, do this steps above titled Apply the Non-Skid Finish.

————— **END OF TASK** —————

TASK 51-21-97-370-801

3. Apply the Epoxy Walkway Coating to the Bulk Cargo Entryway

A. References

Reference	Title
20-30-85-910-801	Final Cleaning of All Organic Coatings Prior to Painting (Series 85) (P/B 201)
51-21-21-370-801	Prepare the Surface to be Painted (P/B 701)

B. Tools/Equipment

Reference	Description
STD-1133	Gun - Spray, Paint, with Interchangeable Nozzles

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C. Consumable Materials

Reference	Description	Specification
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00166	Abrasive - pumice	
B01005	Solvent - Final Cleaning Of All Organic Coatings Prior To Painting (AMM 20-30-85/201) - Series 85	
C00260	Coating - Chemical And Solvent Resistant Finish, Epoxy Resin Enamel	BMS10-11, Type II
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G50123	Rag - Epoxy Coated Tack Rag - C-60	

D. Prepare the Surface

SUBTASK 51-21-97-370-001

(1) Prepare the upper surface of the scuff plate assembly to apply the non-skid finish, do this task: Prepare the Surface to be Painted, TASK 51-21-21-370-801.

(a) Clean and reactivate the primer.

E. Apply the Non-Skid Finish (Recommended Procedure)

SUBTASK 51-21-97-370-002

(1) Prepare the non-skid finish.

(a) Mix the coating, C00260 with the catalyst.

NOTE: Follow the manufacturers instructions to mix the enamel.

1) Add the thinner if it is necessary to get the proper paint viscosity

(b) Add one pound (0.45 kilogram) of No. 1-1/2 grit pumice abrasive, B00166 to one gallon (3.8 liters) of mixed, ready-to-spray coating, C00260 enamel.

1) Let the mixture stay for one hour from the time you added the catalyst.

(c) Before and during the process, continue to shake the mixture of pumice and enamel.

1) This is to make sure it stays mixed while it is being applied to the surface.

SUBTASK 51-21-97-370-003

(2) Apply the pumice and enamel mixture with a spray paint spray gun with interchangeable nozzles, STD-1133 as follows:

(a) Apply a cross coat of one layer of the pumice and enamel mixture.

NOTE: Make sure the surface of the layer is smooth.

1) Let the enamel/pumice dry for 60 minutes (minimum) at 70°F or more.

(b) Apply 1-1/2 cross coats (i.e. three wet passes) of coating, C00260 epoxy enamel (without pumice) with the applicable spray equipment.

1) Let the layers of enamel dry for 24 hours (minimum) at 70°F before you move or touch the surface.

2) The layers of enamel must dry for 7 days (minimum) before you walk on the surface.

NOTE: You can make the drying of the last layer shorter when you increase the temperature. This is after it has dried for a minimum of one hour at 70°F (21°C).

(c) Carefully remove the masking tape before the layers are fully dry.

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F. Apply the non-skid finish (Optional Procedure)

SUBTASK 51-21-97-370-004

- (1) Prepare the non-skid finish, do this task: Prepare the Surface to be Painted, TASK 51-21-21-370-801.

(a) Clean and reactivate the primer.

SUBTASK 51-21-97-370-005

- (2) Mix the coating, C00260 with the catalyst.

NOTE: Follow the manufacturers instructions to mix the enamel.

- (a) Add the thinner if it is necessary to get the correct paint spray viscosity.
- (b) Let the mixed enamel stay for one hour from the time you added the catalyst.
- (c) Apply the one wet layer of coating, C00260 with a spray gun paint spray gun with interchangeable nozzles, STD-1133.
- (d) Immediately apply the dry No.1-1/2 pumice abrasive, B00166 to a heavy and equal layer.
- 1) You can apply the dry pumice grit pumice abrasive, B00166 with a Binks No. 171 spray gun with a No. 58-11 tip, or its equivalent.
- (e) Remove the loose pumice.
- 1) Tilt the panel, if it is possible, to let the loose pumice fall off.
- 2) Use compressed air with 10 psi or less pressure.
- (f) Apply 2 wet layers of coating, C00260 epoxy enamel on the pumice grit with a spray gun paint spray gun with interchangeable nozzles, STD-1133.
- 1) Let the layers of the enamel dry for 24 hours (minimum) at 70°F (21°C) before you move or touch the surface.
- 2) The layers of enamel must dry for 7 days (minimum) at 70°F (21°C) before you walk on the surface.

NOTE: You can make the drying of the last layer shorter when you increase the temperature. This is after it has dried for a minimum of one hour at 70°F (21°C).

- (g) Make sure you carefully remove the masking tape before the layers are fully dry.

G. Repair the Nonskid Surface (Small Damaged Areas)

SUBTASK 51-21-97-160-003

- (1) Prepare the area to be repaired as follows:

NOTE: Repair of damages that are less than 10 percent of the coated area.

- (a) Remove loose material.
- (b) Rub the surface smooth with 100-grit or finer abrasive cloth, B00102.
- (c) Smooth and feather the paint edges with 100-grit or finer abrasive cloth, B00102.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (d) Clean the surface with a clean cotton wiper, G00034 that is moist with Series 85 solvent, B01005 (TASK 20-30-85-910-801).
- (e) Use a clean cotton wiper, G00034 to make sure the surface is fully dry.

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(f) Use a C-60 rag, G50123 if it is necessary to remove unwanted materials.

SUBTASK 51-21-97-370-007

(2) To apply nonskid finish, do the steps above titled Apply the Non-Skid Finish.

END OF TASK

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HEAT, WEATHER AND OIL RESISTANT INORGANIC PROTECTIVE COATING - CLEANING/PAINTING

1. General

- A. This procedure contains the task to apply the inorganic protective coating. This coating gives corrosion protection at a maximum temperature of 900°F (482.2°C).

TASK 51-21-98-300-801

2. Heat, Weather and Oil Resistant Inorganic Protective Coating Application

A. Consumable Materials

Reference	Description	Specification
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00211	Cleaner - Titanium - Turco 4181	
C00251	Coating - Inorganic, Heat, Weather And Oil Resistant Protective Coating (Room Temperature Catalytic Cure)	BMS14-4, Type II

B. Prepare the Parts

SUBTASK 51-21-98-150-001

WARNING: DO NOT GET FINISHES, CLEANERS, THINNERS AND SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN OR CLOTHES. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. MAKE SURE THE AIR FLOWS FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY OR DAMAGE.

(1) Remove the coating.

- (a) Soak the parts fully in Turco 4181 cleaner, B00211 (1-2 pounds (0.5-0.9 kilogram) for each gallon (3.8 liters) of the solution) at 190 to 210°F (87.8-98.9°C) until there is no more coating on the parts.
- (b) Flush the parts with water.
- (c) Put the parts in an oven at 200 (± 25)°F (93.3 ± 13.9°C) to dry.

SUBTASK 51-21-98-110-001

(2) Clean the parts with solvent.

- (a) For parts made from titanium or its alloys, clean with nonchlorinated solvent.

NOTE: Do not use chlorinated solvent on titanium.

- (b) For parts made from ferrous alloys, clean with solvent or clean by vapor degreasing.

SUBTASK 51-21-98-140-001

(3) Remove grit with a clean 100 to 250 grit abrasive cloth, B00102 paper.

SUBTASK 51-21-98-160-001

(4) Clean the parts with compressed air to remove dirt and other contamination.

NOTE: After you clean the parts, do not touch the parts with your bare hands. Use clean, white cotton gloves when you touch the parts.

SUBTASK 51-21-98-950-001

(5) Put a cover on the parts until you apply the coating.

- (a) Make sure you apply the coating in 4 hours.

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C. Procedure

SUBTASK 51-21-98-370-001

- (1) Apply the inorganic protective coating.
 - (a) Fully mix the material before you use it.
 - (b) Use a spray equipment or an electrostatic spray equipment to apply the coating, C00251 coating.
 - (c) Apply the coating, C00251 Sermetel 249 until you get a constant, smooth, gray layer.
 - (d) Let the parts dry for 30 minutes at ambient temperature.
 - (e) Put covers on the adjacent areas.
 - (f) Apply one layer of the coating, C00251 catalyst to the surface.

NOTE: Do not mix the coating with the catalyst.
 - (g) Let the surface dry for 16 hours, or 4 hours at 300 (± 50)°F (148.9 \pm 27.8°C).
 - (h) Make sure you can see no bubbles or runs on the dry surface.
 - (i) Make sure the coating is 0.002 to 0.003 inch (0.051-0.076 mm) thick.

SUBTASK 51-21-98-140-002

- (2) Rub the surface with a rigid bristle brush or a soft cloth buffing wheel until you get a smooth, shiny finish.

————— END OF TASK —————

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DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING

1. General

A. This procedure contains these tasks:

- (1) Decorative Exterior Paint System Application
- (2) Decorative Exterior Paint System Repair
- (3) Decorative Exterior Paint System Thickness Measurement (Eddy Current Testing Method).
- (4) Decorative Exterior Paint System Thickness Measurement (Ultrasonic Testing Method).

TASK 51-21-99-300-801

2. Decorative Exterior Paint System Application

A. General

- (1) Do not get paint or primer on the surfaces of the items that follow:
 - (a) Decoupled static dischargers or retainers on the wing and empanage
 - (b) Rain repellent nozzles that are forward of the windshields
 - (c) Rubber mohair seals, rub strips made of stainless steel, anodized handles and door handle pans, or silicone rubber sealant
 - (d) Pressure relief valves or outflow valves
 - (e) Circular bands, one inch in width, around or on the pressure relief valve doors, or outflow valves
 - (f) Door operating mechanisms, hinge assemblies, and equivalent surfaces
 - (g) Flight deck and main cabin windows
 - (h) Pitot probes and static air data ports
 - (i) Exterior Light Lens Covers
- (2) Do not allow solvents, cleaners, or overspray to contact polycarbafil plastic parts
- (3) Paint should meet the requirements of BMS 10-72 or AMS 3095. In addition to this procedure, Boeing specification D6-1816 provides procedures for decorative exterior paint system application.

B. References

Reference	Title
51-21-21-100-801	Clean the Surface to be Painted (P/B 701)
51-21-21-370-801	Prepare the Surface to be Painted (P/B 701)
53-52-00-370-801	Nose Radome - Cleaning and Painting (P/B 701)

C. Procedure

SUBTASK 51-21-99-370-009

- (1) Do this task: Nose Radome - Cleaning and Painting, TASK 53-52-00-370-801

SUBTASK 51-21-99-100-001

- (2) Do this task: Clean the Surface to be Painted, TASK 51-21-21-100-801.

SUBTASK 51-21-99-840-001

- (3) Do this task: Prepare the Surface to be Painted, TASK 51-21-21-370-801.

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SUBTASK 51-21-99-370-001

WARNING: DO NOT GET THE FINISHES, CLEANERS, THINNERS AND SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN OR CLOTHES. DO NOT BREATHE THE FUMES FROM THESE MATERIALS. MAKE SURE THE AIR FLOWS FREELY THROUGH THE WORK AREA. USE THE NECESSARY RESPIRATORY PROTECTION. KEEP THESE MATERIALS AWAY FROM SPARKS, FLAME AND HEAT. THESE MATERIALS ARE POISONOUS AND FLAMMABLE AND CAN CAUSE INJURY OR DAMAGE.

WARNING: USE ONLY APPROVED TRANSPARENT MATERIALS ON THE ACRYLIC WINDOW PANES. PAINT, MATERIALS THAT ARE NOT TRANSPARENT, AND TRANSPARENT MATERIALS THAT ARE NOT APPROVED CAN PREVENT DETECTION OF DAMAGE. THESE MATERIALS CAN ALSO CAUSE DAMAGE TO THE STRUCTURE OF ACRYLIC WINDOWS. THIS CAN MAKE FLIGHT DANGEROUS.

- (4) Apply the decorative exterior paint system as specified by the paint manufacturer's specifications and with the table (Table 701).

Table 701/51-21-99-993-803 Decorative Exterior Paint System Application Specifications

Description	Coating Specification	Application Specification
Chemical & Solvent Resistant Finishes	BMS10-11	BAC 5736
Corrosion Resistant Finish for Integral Fuel Tanks	BMS10-20	BAC 5793
Polyurethane Enamel	BMS10-60	BAC 5845
Exterior Decorative Paint	BMS10-72	D6-1816
Urethane Compatible Primer	BMS10-79	BAC 5882

END OF TASK

TASK 51-21-99-300-802

3. Decorative Exterior Paint System Repair

A. References

Reference	Title
20-30-85-910-801	Final Cleaning of All Organic Coatings Prior to Painting (Series 85) (P/B 201)
51-21-11-150-801	Paint Stripping (P/B 701)

B. Consumable Materials

Reference	Description	Specification
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B01005	Solvent - Final Cleaning Of All Organic Coatings Prior To Painting (AMM 20-30-85/201) - Series 85	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

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C. Procedure

SUBTASK 51-21-99-370-006

(1) Repair areas with minor damage (no bare metal) as follows:

- (a) Rub the surface smooth with a 240 grit (minimum) wet or dry abrasive cloth, B00102 paper.
- (b) Remove the remaining particles with a clean cotton wiper, G00034 that is moist with Series 85 solvent, B01005, do this task: Final Cleaning of All Organic Coatings Prior to Painting (Series 85), TASK 20-30-85-910-801.
- (c) Dry the surface with a clean cotton wiper, G00034.
- (d) Apply the applicable primer and topcoats again, if necessary, as follows:
 - 1) Do this task: Decorative Exterior Paint System Application, TASK 51-21-99-300-801.
- (e) Make sure you get a smooth continuous surface.

SUBTASK 51-21-99-370-007

(2) Repair areas with large damage (bare metal) as follows:

CAUTION: DO NOT LET THE PAINT STRIPPER TOUCH FIBERGLASS OR SEAMS OF ADHESIVE BONDED PARTS. THE PAINT STRIPPER CAN CAUSE DAMAGE TO FIBERGLASS OR SEAMS OF ADHESIVE BONDED PARTS.

- (a) Rub the surface smooth with abrasive cloth, B00102, or, do this task: Paint Stripping, TASK 51-21-11-150-801.
- (b) Feather the edges of the adjacent area with a 240 grit (minimum) abrasive cloth, B00102 paper that is moist with water.
- (c) Remove the remaining particles with a clean cotton wiper, G00034 that is moist with Series 85 solvent, B01005 (TASK 20-30-85-910-801).
- (d) Dry the surface with a clean cotton wiper, G00034.
- (e) Apply the applicable primer and topcoats as follows:
 - 1) Do this task: Decorative Exterior Paint System Application, TASK 51-21-99-300-801.
- (f) Feather all the edges to get a smooth continuous finish.

SUBTASK 51-21-99-370-008

(3) Repair areas with defective paint layers as follows:

- (a) Rub the surface with a 240 grit (minimum) wet or dry abrasive cloth, B00102 paper to remove defects.
- (b) Feather the edges into the adjacent areas.
- (c) Remove the remaining particles with a clean cotton wiper, G00034 that is moist with Series 85 solvent, B01005 (TASK 20-30-85-910-801).
- (d) Dry the surface with a clean cotton wiper, G00034.
- (e) Apply the applicable topcoats per manufacturer's specifications and Table 701.
- (f) Feather the edges to get a smooth continuous finish.

————— **END OF TASK** —————

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TASK 51-21-99-250-801

4. Decorative Exterior Paint System Thickness Measurement (Eddy Current Testing Method).

A. Procedure (Eddy Current Method)

NOTE: This task is intended to supplement test equipment manufacturers' instructions for the manual operation of the test equipment, and is not intended to replace them.

SUBTASK 51-21-99-100-002

(1) Prepare for the Inspection.

- (a) Get access to the inspection area.
- (b) Remove loose paint, dirt and sealant from the surface of the part to be examined.
- (c) Make sure that the temperature in the area where the material will be examined is between 40°F (4°C) and 90°F (32°C) and will not change during the test. Do not do a test of the material in direct sunlight or in a cool airflow.

NOTE: Changes in material temperature will change the conductivity.

SUBTASK 51-21-99-820-001

(2) Calibrate the Instrument.

NOTE: Different test equipment manufacturers follow different methods of calibration or adjustment. Verify calibration according to manufacturer's instructions.

- (a) To decrease the risk of errors caused by temperature, put the instrument, probe, reference standards, and the material to be examined at the location where the inspection will be done.
- (b) Use nonconductive thickness shims to verify calibration or test blocks bearing calibrated nonconductive coatings that are traceable to a suitable National Institute of Standards and Technology (NIST) or similar regional standards authority.
- (c) Make sure that the instrument, probe, reference standards, and the material to be examined are at the same temperature.
- (d) Measure the thickness of a series of non conductive shims covering the expected range of coating thickness.

NOTE: Verify the test equipment at regular intervals to prevent an inaccurate reading.

SUBTASK 51-21-99-250-001

(3) Measure the paint thickness as follows:

- (a) Inspect the test equipment probe and area to be measured are clean and free of debris.
- (b) Take multiple readings on the on the bare surface (areas free from paint) to establish the base reference.
- (c) Identify the minimum distance the test equipment must be from edges, fasteners, ridges or other structure and the curvature limit that would cause an abnormal measurement change.

NOTE: This prevents incorrect indications on the test equipment.

- (d) Take multiple readings on the on the coated surface to establish the paint thickness measurement.

SUBTASK 51-21-99-970-001

(4) Report the information as follows (if necessary):

- (a) Instrument used, serial number.

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- (b) Range, mean average of the thickness indications.
- (c) Record each indication if necessary.

————— END OF TASK —————

TASK 51-21-99-270-801

5. Decorative Exterior Paint System Thickness Measurement (Ultrasonic Testing Method).

A. Procedure (Ultrasonic Method)

SUBTASK 51-21-99-100-003

NOTE: This task is intended to supplement test equipment manufacturers' instructions for the manual operation of the test equipment, and is not intended to replace them.

- (1) Prepare for the Inspection.
 - (a) Get access to the inspection area.
 - (b) Remove loose paint, dirt and sealant from the surface of the part to be examined.

NOTE: Rough surfaces can give incorrect indications. Thus the area must be smooth.

SUBTASK 51-21-99-820-002

- (2) Calibrate the Instrument.

NOTE: Different test equipment manufacturers follow different methods of calibration or adjustment. Verify calibration according to manufacturer's instructions.

- (a) A couplant is necessary to transmit the ultrasonic pulse from the test equipment's probe into the coating. The couplants that follow can possibly be used with the test equipment:

NOTE: For specific information regarding the use of couplants, refer to the test equipment's instructions.

- 1) Water.
 - a) Ideal for smooth, thin coatings.
- 2) Glycol gel.
 - a) For rough coatings, provided it is not a contaminant for the coating to be measured.
- 3) Other liquids such as liquid soap may be used.
- (b) Use nonconductive thickness shims to verify calibration or test blocks bearing calibrated nonconductive coatings that are traceable to a suitable National Institute of Standards and Technology (NIST) or similar regional standards authority.
- (c) Although most ultrasonic instruments are pre-calibrated, accuracy should be verified by measuring a known thickness of the coating (reference standard) as determined by:
 - 1) A thickness equal to or more than the coating thickness range to be measured.

NOTE: Verify the test equipment at regular intervals to prevent an inaccurate reading.

SUBTASK 51-21-99-270-001

- (3) Measure the paint thickness as follows:
 - (a) Inspect the test equipment probe and area to be measured are clean and free of debris.
 - (b) Apply couplant to the area.
 - (c) Place the instrument's probe flat on the surface and apply constant pressure. Hold the probe steady during the measurement.
 - (d) Take multiple readings on the on the bare surface (areas free from paint) to establish the base reference.

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- (e) Identify the minimum distance the test equipment must be from edges, fasteners, ridges or other structure and the curvature limit that would cause an abnormal measurement change.

NOTE: This prevents incorrect indications on the test equipment.

- (f) Take multiple readings on the on the coated surface to establish the paint thickness measurement.
- (g) Remove the couplant used in the process.

SUBTASK 51-21-99-970-002

- (4) Report the information as follows (if necessary):
 - (a) Instrument used, serial number.
 - (b) Type of base material.
 - (c) Type of coating.
 - (d) Range, mean average of the thickness indications.
 - (e) Record each indication if necessary.

————— **END OF TASK** —————

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SEALS AND SEALING - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Prepare for Sealing
- (2) Non-Removable Faying (Mated) Surface Seal Application
- (3) Removable Faying (Mated) Surface Seal Application
- (4) Repair of Insufficient Faying (Mated) Sealant Squeeze Out at Shear Tie and Stringer Locations
- (5) Injection Seals Application
- (6) Hole and Slot Seals Application
- (7) Fillet Seals Application
- (8) Fillet Seals Repair
- (9) Fastener Seals Application
- (10) Aerodynamic Smoothers Application
- (11) Electrical Fitting seals Application
- (12) Fuel Seals Application
- (13) Protection for Sealing Materials
- (14) Accelerate Curing
- (15) Chemical Sealant Removal

B. Sealant prevents leakage of fluids and gases.

- (1) Listen for an air leak during a fuselage pressure check to help you find the location of the air leakage.
- (2) Look for fluids or stains that are on the dry side of the structural members to help you find the location of the fluid leakage.

C. Do not cause blockage to the drain holes when you apply the sealant.

- (1) There are drain (limber) holes in the fuselage stringers and fuselage frames.
 - (a) The drain holes permit fluids and condensation to drain down to the external (overboard) drains that are on the bottom of the airplane.

D. For information on types of sealant, see the procedures on Adhesives, Cements, and Sealers (TASK 20-30-11-910-801).

TASK 51-31-00-160-801

2. Prepare For Sealing

(Figure 201, Figure 202, Figure 203, Figure 204, Figure 205, Figure 206, Figure 207)

A. References

Reference	Title
20-30-11-910-801	Adhesives, Cements, and Sealants (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved (Part #: 1-6390-A, Supplier: 63318, A/P Effectivity: 737-ALL) (Part #: 10810, Supplier: \$0855, A/P Effectivity: 737-ALL) (Part #: 234350, Supplier: \$0857, A/P Effectivity: 737-ALL) (Part #: 311, Supplier: KA861, A/P Effectivity: 737-ALL) (Part #: 411B60, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: 411B90, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: DAD5013, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: DFD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: J5-0275-2010, Supplier: 435R8, A/P Effectivity: 737-ALL) (Part #: SCD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: ST982LF, Supplier: 3Z323, A/P Effectivity: 737-ALL) (Part #: TS1275-4, Supplier: 1DWR5, A/P Effectivity: 737-ALL)
COM-4746	Handle - Sealant Removal Tool (Part #: 310/1, Supplier: KA861, A/P Effectivity: 737-ALL) (Part #: SHN0272, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: SHR0272-T, Supplier: 1DWR5, A/P Effectivity: 737-ALL)
COM-4747	Pneumatic Scraper Sharpener (Part #: 309/3, Supplier: KA861, A/P Effectivity: 737-ALL)
STD-123	Brush - Soft Bristle

C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - Aliphatic Naphtha (For Acrylic Plastics)	TT-N-95 Type II, ASTM D-3735 Type III
B00137	Abrasive - Garnet Coated Paper	ANSI B74.18
B01012	Solvent - Final Cleaning Prior To General Sealing (AMM 20-30-92/201) - Series 92	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054
G50260	Sandpaper - Aluminum Oxide, 220 Grit	BAC5000
G50261	Sandpaper - Aluminum Oxide, 400 Grit	BAC5000
G50262	Wiper - Cleaning	BMS15-5

D. Procedure

SUBTASK 51-31-00-350-001

- (1) If structural repair is necessary on the airplane structure, refer to the Structural Repair Manual (SRM).

SUBTASK 51-31-00-210-001

- (2) Examine the seal in the area where there is a leak.
 - (a) Identify the seal surface and the seal plane in the adjacent structure.

NOTE: The seal plane is the limit plane through the assembly of Structural Items where you find a continuous flow of fluids or gases.
 - (b) Identify the type of seal necessary to do the repair.

CAUTION: DO NOT MIX THE SEALING MATERIALS. THE SEALING MATERIALS CAN CONTAMINATE EACH OTHER AND CAUSE AN UNSATISFACTORY BOND.

- (c) Identify the type of sealant that is used in the damaged area; do this task: Adhesives, Cements, and Sealants, TASK 20-30-11-910-801.

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SUBTASK 51-31-00-160-001

CAUTION: ONLY USE APPROVED SCRAPERS ON THE AIRPLANE SKIN. SCRAPERS THAT ARE NOT APPROVED CAN MAKE SCRATCHES ON THE SKIN, AND CAUSE FATIGUE CRACKS.

- (3) Remove all of the sealant from the damaged area:
- (a) Remove the loose pieces of the sealant from the damaged areas.
 - (b) Use a sealant removal tool, COM-2481 and sealant tool removal handle, COM-4746.
 - (c) If necessary, do these steps to sharpen the scraper:
 - 1) Sharpen the scraper with Sandpaper, G50260 or finer by hand or by metal sharpening wheel (scraper sharpener, COM-4747).
 - 2) If you sharpen the scraper by hand, rub the sharpened scraper on wiper, G50262 to remove loose sanding particles.
 - 3) If you use a metal sharpening wheel, rub the sharpened scraper on Sandpaper, G50261 or finer aluminum oxide paper to remove debris, and then rub it on wiper, G50262 to remove loose sanding particles.

SUBTASK 51-31-00-160-002

- (4) Clean the area before you apply the sealant:

- (a) Remove shavings, chips, and other loose materials with a vacuum cleaner.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. SOLVENTS MAY BE FLAMMABLE OR HARMFUL TO THE ENVIRONMENT. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (b) Remove the grease, oil, dirt, and other contamination with a cotton wiper, G00034 or a soft bristle brush, STD-123 wet with Series 92 solvent, B01012 (TASK 20-30-92-910-801).

NOTE: Make sure you clean an area that is larger than the area to be sealed.

NOTE: Make sure you use only solvent, B00083 to clean on or around acrylic surfaces.

- (c) Do these steps to clean enamel painted surfaces:

- 1) Abrade (sand) the surface with a abrasive mat, G00251 (100 grit or finer) to remove the gloss of the paint.

NOTE: Do not abrade (sand) through the paint.

- (d) Do the steps that follow to clean composite laminate surfaces that are unpainted:

- 1) Clean the surface with a cotton wiper, G00034 that is moist with Series 92 solvent, B01012 (TASK 20-30-92-910-801).
- 2) Abrade (sand) the surface with 150 grit (or finer) abrasive, B00137.
- 3) Wipe the surface with cotton wiper, G00034 that is damp with solvent.

NOTE: Make sure the surface is clean and dry.

- (e) Do the steps that follow to clean the area immediately before you apply the sealant:

NOTE: These steps apply to composite laminate surfaces that are painted.

- 1) Make sure you clean an area that is larger than the area necessary to apply the sealant.

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- 2) Make sure you use a clean cotton wiper, G00034 that is moist with Series 92 solvent, B01012 (TASK 20-30-92-910-801).

NOTE: Before the solvent dries, wipe the area again with a clean, dry cotton wiper, G00034.

- 3) Continue to clean the area with a clean cotton wiper, G00034 until there is no sign of grease, oil, dirt, or other contamination.

NOTE: There can be signs of primer on the wiper cloth because primer is not a sign of contamination.

- 4) Make sure the solvent is removed from the area with a dry, clean cotton wiper, G00034 before the solvent dries.
- 5) If a large quantity of primer was accidentally removed from the area, apply more primer to the area after you apply the sealant .
- 6) Make sure the sealant is removed completely to expose the surface.

————— **END OF TASK** —————

TASK 51-31-00-390-801

3. Non-Removable Faying (Mated) Surface Seal Application

(Figure 201)

A. General

- (1) Make sure the area is clean before you apply the sealant.
- (2) Prepare the tools and equipment that are necessary to apply the sealant.
- (3) Do not mix the tools you use for silicone with the tools you use for the non-silicone materials.
- (4) Do not apply the materials, which are used to smooth, fair, and seal, on the zinc chromate primer until the primer is hard and strong.

B. Procedure

SUBTASK 51-31-00-840-001

- (1) Do this task: Prepare For Sealing, TASK 51-31-00-160-801.

SUBTASK 51-31-00-390-001

CAUTION: DO NOT CAUSE A BLOCKAGE WHEN YOU APPLY SEALANT NEAR OR AROUND THE FUSELAGE DRAIN HOLES, TUBES, OR PATHS. THE FUNCTION OF THE DRAIN HOLES IS TO DRAIN CONDENSATION AND FLUIDS OVERBOARD. IF YOU CAUSE A BLOCKAGE, FLUIDS WILL COLLECT IN THE AIRPLANE. THE FLUIDS CAN CAUSE CORROSION TO THE STRUCTURE, OR A FIRE IF THE FLUIDS ARE FLAMMABLE.

- (2) Apply the sealant to one surface with a sealant gun, spatula (Boeing Tool Number ST982 for example), brush, roller, smooth or serrated paper, or spray gun.

NOTE: A roller is the recommended method to get an equal thickness.

- (a) Make sure you apply the sealing compound on the full area of the faying (mated) surface.

NOTE: The thickness of the sealing compound must be 0.005 in. (0.127 mm). If necessary, the sealing compound thickness can be between 0.010 in. (0.254 mm) and 0.030 in. (0.762 mm) depending on fit-up of parts.

SUBTASK 51-31-00-390-002

- (3) Put the component parts together. Install the necessary fasteners.

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SUBTASK 51-31-00-390-016

- (4) If you will seal the fasteners, make sure you install them during the pot life of the sealing compound.

SUBTASK 51-31-00-390-017

- (5) If you cannot install the permanent fasteners before the pot life of the sealing compound ends, use temporary fasteners to hold the parts together until the sealing compound dries.

SUBTASK 51-31-00-390-018

- (6) Install the permanent fasteners with the new sealant.

SUBTASK 51-31-00-390-019

- (7) Apply the sealant on the fastener or in the hole.

SUBTASK 51-31-00-390-020

- (8) Make sure you apply clamps to squeeze the beads of sealant to show a continuous and equal squeeze-out.

SUBTASK 51-31-00-390-021

- (9) Make sure the faying (mated) surface is smooth and the squeeze out is approximately 0.06 inch (1.52 mm) along the joint.
 - (a) If the squeeze out is insufficient at shear tie and stringer locations of the fuselage, do this task: Repair of Insufficient Faying (Mated) Sealant Squeeze Out at Fuselage Shear Tie and Stringer Locations, TASK 51-31-00-390-811.

————— **END OF TASK** —————

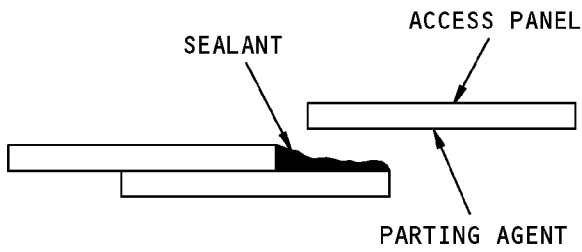
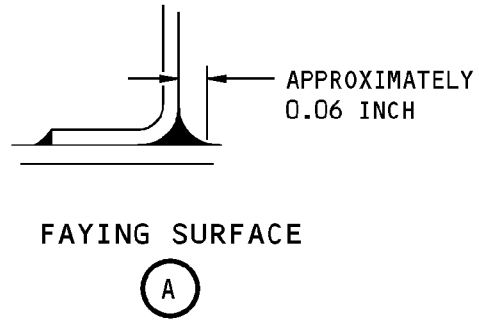
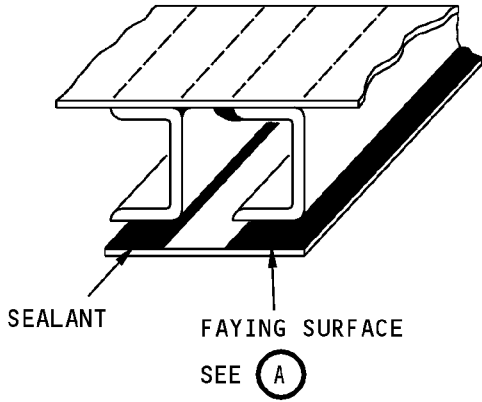
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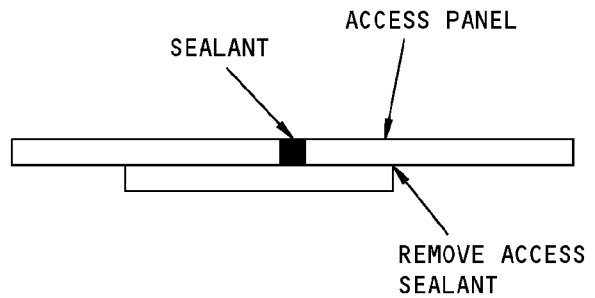
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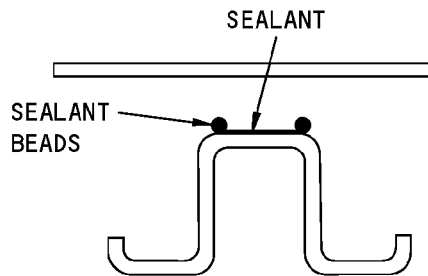
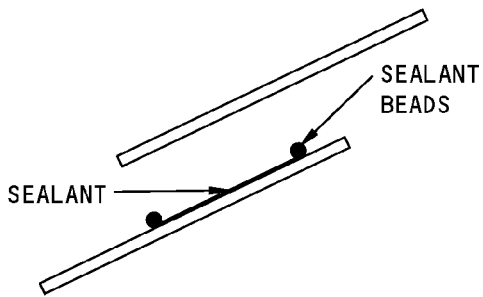


STEP 1



STEP 2

REMOVABLE SEALS
(THE SEAL IS APPLIED IMMEDIATELY BEFORE THE
ACCESS PANEL IS INSTALLED)



FAYING SURFACE SEALANT WITH SEALING BEADS ADDED

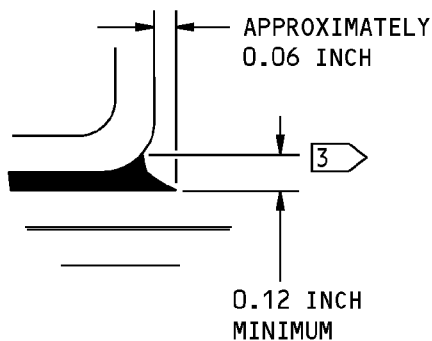
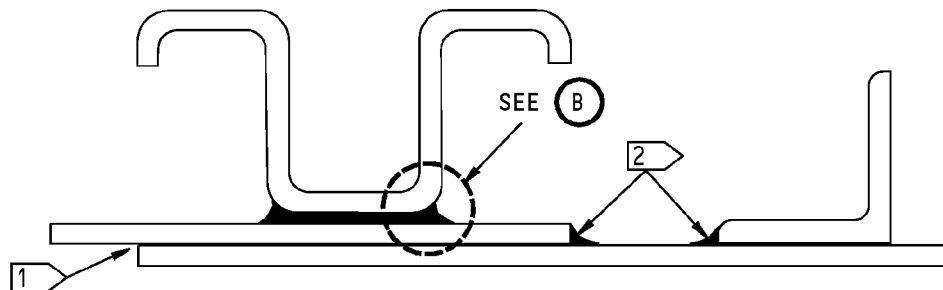
Faying Surface Seal
Figure 201 (Sheet 1 of 2)/51-31-00-990-801

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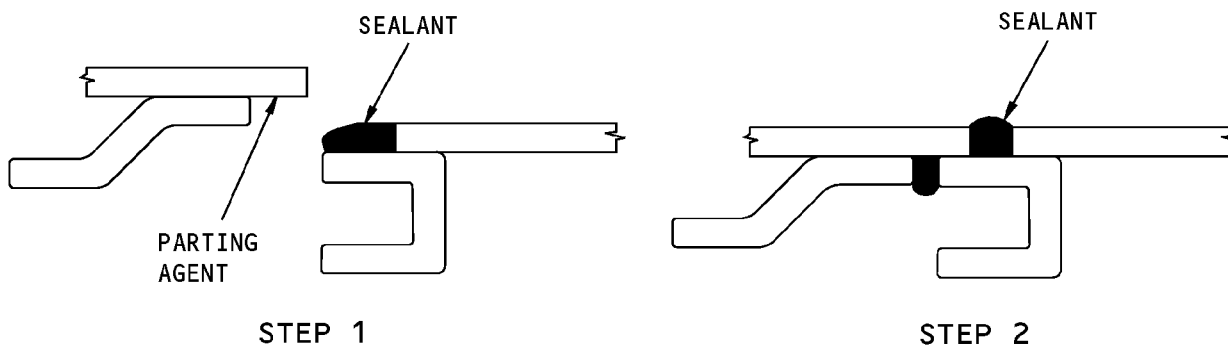
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(B)



- 1 EXTERNAL BODY SECTION AND FUEL SIDE OF WING SPAR.
- 2 MAKE SURE THE FAIRED-OUT EXTRUDED SEALANT IS APPROXIMATELY AS SHOWN.
- 3 THIS SHOWS SEALANT EXTRUDED AFTER THE ASSEMBLY AND FAIRED WITH A FAIRING TOOL.

Faying Surface Seal
Figure 201 (Sheet 2 of 2)/51-31-00-990-801

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TASK 51-31-00-390-810

4. Removable Faying (Mated) Surface Seal Application

A. General

- (1) You must clean all of the equipment before and after you apply the sealing compound.
- (2) When sealing compounds are used with an activator, you must clean the equipment before the compounds become hard.
- (3) Do not mix the tools that you use for silicone with the tools you use for non-silicone materials.
- (4) Do not apply the smoothing, fairing, and sealing materials on the zinc chromate primer until the primer is hard and strong.

B. Consumable Materials

Reference	Description	Specification
G50365	Agent - Peelable Parting (AC Products - AC962-73C)	
G50366	Agent - Parting, Peelable, AZ 534-2B (0A3C8 - Aztec Chemical, Inc., El Monte, CA)	BAC5000, PSD 6-187
G50367	Agent - Peelable Parting (Aztec Chemical AZ 634-2)	MIL-PRF-6799, BAC 5000
G50368	Agent - Peelable Parting (Rexco Chemical Company - Partall Coverall Film)	
G50369	Agent - Peelable Parting (Spraylat - SC-1071H-1 Blue, ZR-5827)	BAC5000, PSD 6-187

C. Procedure

SUBTASK 51-31-00-940-001

- (1) Do this task: Prepare For Sealing, TASK 51-31-00-160-801.

SUBTASK 51-31-00-390-014

CAUTION: DO NOT LET WET PARTING AGENT TOUCH AN ACRYLIC SURFACE. IF A WET PARTING AGENT TOUCHES AN ACRYLIC SURFACE, DAMAGE MAY OCCUR.

- (2) Apply one of the parting agents listed to one of the mating surfaces. If one of the mating surfaces is acrylic, apply the parting agent to the non acrylic surface.
 - (a) AC962-73C peelable parting agent, G50365
 - (b) peelable parting agent, G50366
 - (c) AZ 634-2 peelable parting agent, G50367
 - (d) Rexco Partall Coverall Film peelable parting agent, G50368
 - (e) Spraylat SC-1071H-1 agent, G50369

SUBTASK 51-31-00-390-015

- (3) When parting agent is dry to touch, apply the sealant to the opposite surface.

CAUTION: DO NOT CAUSE A BLOCKAGE WHEN YOU APPLY SEALANT NEAR OR AROUND THE FUSELAGE DRAIN HOLES, TUBES, OR PATHS. THE FUNCTION OF THE DRAIN HOLES IS TO DRAIN CONDENSATION AND FLUIDS OVERBOARD. IF YOU CAUSE A BLOCKAGE, FLUIDS WILL COLLECT IN THE AIRPLANE. THE FLUIDS CAN CAUSE CORROSION TO THE STRUCTURE OR A FIRE IF THE FLUIDS ARE FLAMMABLE.

- (a) Apply the sealing compound to one surface with a sealant gun, spatula (Boeing Tool Number ST982 for example), brush, roller, smooth or serrated scraper, or spray gun.

NOTE: A roller is the recommended method to get an equal thickness.

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- 1) Make sure you apply the sealing compound on the full area of the faying (mated) surface.

NOTE: The thickness of the sealing compound must be 1/32 in. (0.8 mm).

SUBTASK 51-31-00-420-003

- (4) Put the component parts together. Install the necessary fasteners.

SUBTASK 51-31-00-390-022

- (5) If you will seal the fasteners, make sure you install them during the pot life of the sealing compound.

SUBTASK 51-31-00-390-023

- (6) If you cannot install the permanent fasteners before the pot life of the sealing compound ends, use temporary fasteners to hold the parts together until the sealing compound dries.

SUBTASK 51-31-00-390-024

- (7) Install the permanent fasteners with the new sealant.

SUBTASK 51-31-00-390-025

- (8) Apply the sealant on the fastener or in the hole.

SUBTASK 51-31-00-390-026

- (9) Make sure you apply clamps to squeeze the beads of sealant to show a continuous and equal squeeze-out.

SUBTASK 51-31-00-390-027

- (10) Make sure the faying (mated) surface is smooth and the squeeze out is approximately 0.06 in. (1.52 mm) along the joint.

————— END OF TASK —————

TASK 51-31-00-390-811

5. Repair of Insufficient Faying (Mated) Sealant Squeeze Out at Fuselage Shear Tie and Stringer Locations

A. General

- (1) Do this task if the faying surfaces show insufficient sealant squeeze out at shear tie and stringer locations and no fillet is present inside the fuselage.
- (2) Refer to Fillet Seals Repair, TASK 51-31-00-390-812 to repair damaged sealant in the areas where a fillet is present.

B. References

Reference	Title
51-21-91-620-802	Application of Corrosion Inhibiting Compound (P/B 701)

C. Procedure

SUBTASK 51-31-00-390-030

- (1) Do these steps if faying surface sealant does not have the required squeeze out as specified in Non-Removable Faying (Mated) Surface Seal Application, TASK 51-31-00-390-801, and corrosion inhibiting compound has not been previously applied:
 - (a) Remove the faying surfaces.
 - (b) Do this task to clean the area: Prepare For Sealing, TASK 51-31-00-160-801.
 - (c) Do this task to re-apply the sealant and install the faying surfaces: Non-Removable Faying (Mated) Surface Seal Application, TASK 51-31-00-390-801:.

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SUBTASK 51-31-00-390-031

(2) Do these steps if faying surface sealant does not have the required squeeze out as specified in Non-Removable Faying (Mated) Surface Seal Application, TASK 51-31-00-390-801, and corrosion inhibiting compound has been previously applied:

- (a) Fill all voids in the areas that do not meet the requirements of Non-Removable Faying (Mated) Surface Seal Application, TASK 51-31-00-390-801 by brushing or spraying additional corrosion inhibiting compound as shown in Application of Corrosion Inhibiting Compound, TASK 51-21-91-620-802

NOTE: Refer to Application of Corrosion Inhibiting Compound, TASK 51-21-91-620-802 for the proper thickness of corrosion inhibiting compound coating.

————— **END OF TASK** —————

TASK 51-31-00-390-802

6. Injection Seal Application

(Figure 202)

A. Tools/Equipment

Reference	Description
STD-449	Gun - Sealant
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic

B. Procedure

SUBTASK 51-31-00-160-003

(1) Do this task: Prepare For Sealing, TASK 51-31-00-160-801.

SUBTASK 51-31-00-390-004

CAUTION: DO NOT CAUSE A BLOCKAGE WHEN YOU APPLY SEALANT NEAR OR AROUND THE FUSELAGE DRAIN HOLES, TUBES, OR PATHS. THE FUNCTION OF THE DRAIN HOLES IS TO DRAIN CONDENSATION AND FLUIDS OVERBOARD. IF YOU CAUSE A BLOCKAGE, FLUIDS WILL COLLECT IN THE AIRPLANE. THE FLUIDS CAN CAUSE CORROSION TO THE STRUCTURE, OR A FIRE IF THE FLUIDS ARE FLAMMABLE.

(2) Apply the sealant.

(a) When a continuous seal is necessary, do the steps that follow:

- 1) Put the sealant into one end of the hole with a sealant gun, STD-449.
 - a) Put the sealant into the hole until the sealant comes out of one of the other openings.
- 2) Put a finger or a hardwood or plastic fillet smoothing spatula, STD-810 on the first opening that is filled.

NOTE: This is to make sure the sealant fully flows out of the other holes.

SUBTASK 51-31-00-390-028

CAUTION: DO NOT FULLY EMPTY A SEALANT GUN. ALWAYS APPLY THE SEALANT FROM ONE DIRECTION. DO NOT SEAL A SURFACE FROM THE TWO ENDS OF A HOLE. AIR POCKETS AND POSSIBLE LEAKS IN THE SEAL CAN OCCUR.

(3) Put the sealant into one end of the hole until the sealant comes out from all other openings.

NOTE: When you apply sealant for the back-up of a fillet, it is not necessary to apply the sealant to the full depth of the opening.

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- (a) When you apply the sealant at the bottom of the slot, make sure you fill the slot.
 - 1) Make sure there is a continuous seal at the bottom and sides of the slot.

————— **END OF TASK** —————

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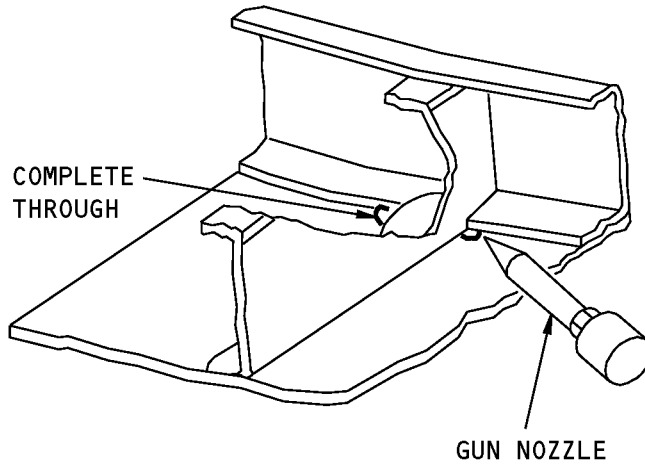
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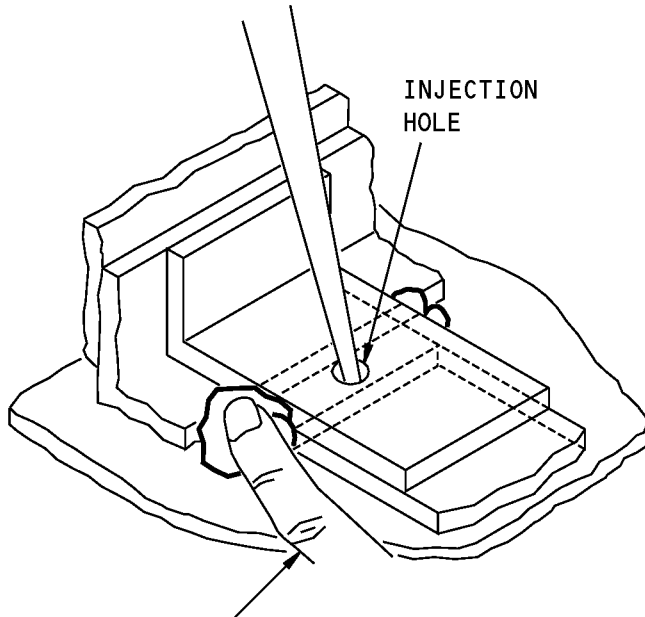
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THE INJECTION SEAL IS COMPLETE
WHEN THE SEALANT GOES THROUGH
TO THE OTHER END



GUN NOZZLE

INJECTION SEAL



INJECTION
HOLE

USE YOUR FINGER OR A SPATULA
TO STOP THE FLOW OF SEALANT.
SEALANT WILL FLOW TO THE OTHER END

**INJECTION SEAL
(BLOCK OFF)**

**Injection Seal
Figure 202/51-31-00-990-802**

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TASK 51-31-00-390-803

7. Hole and Slot Seal Application

(Figure 203)

A. Tools/Equipment

Reference	Description
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic

B. Consumable Materials

Reference	Description	Specification
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)

C. Procedure

SUBTASK 51-31-00-390-005

(1) Apply the sealant.

NOTE: You can put Scotch Flatback Masking Tape 250, G00270 behind the large slots and holes to prevent too much extrusion of the sealant.

NOTE: Make sure the Scotch Flatback Masking Tape 250, G00270 and residue are removed after the sealing is cured.

- (a) Put sealant into all the tool and coordination holes that are not sealed with soft rivets.
 - 1) In fully sealed areas, apply the sealant to the soft rivets.
- (b) Put the sealant compound on the pressure side of the hole as follows:
 - 1) Apply the compound to the pressure side of the hole with a hardwood or plastic fillet smoothing spatula, STD-810 or applicable tool.
 - 2) Apply the sealant compound tightly into the hole or the slot.
 - 3) Make sure all sides of the sealant are feathered on all of the adjacent surfaces.

END OF TASK

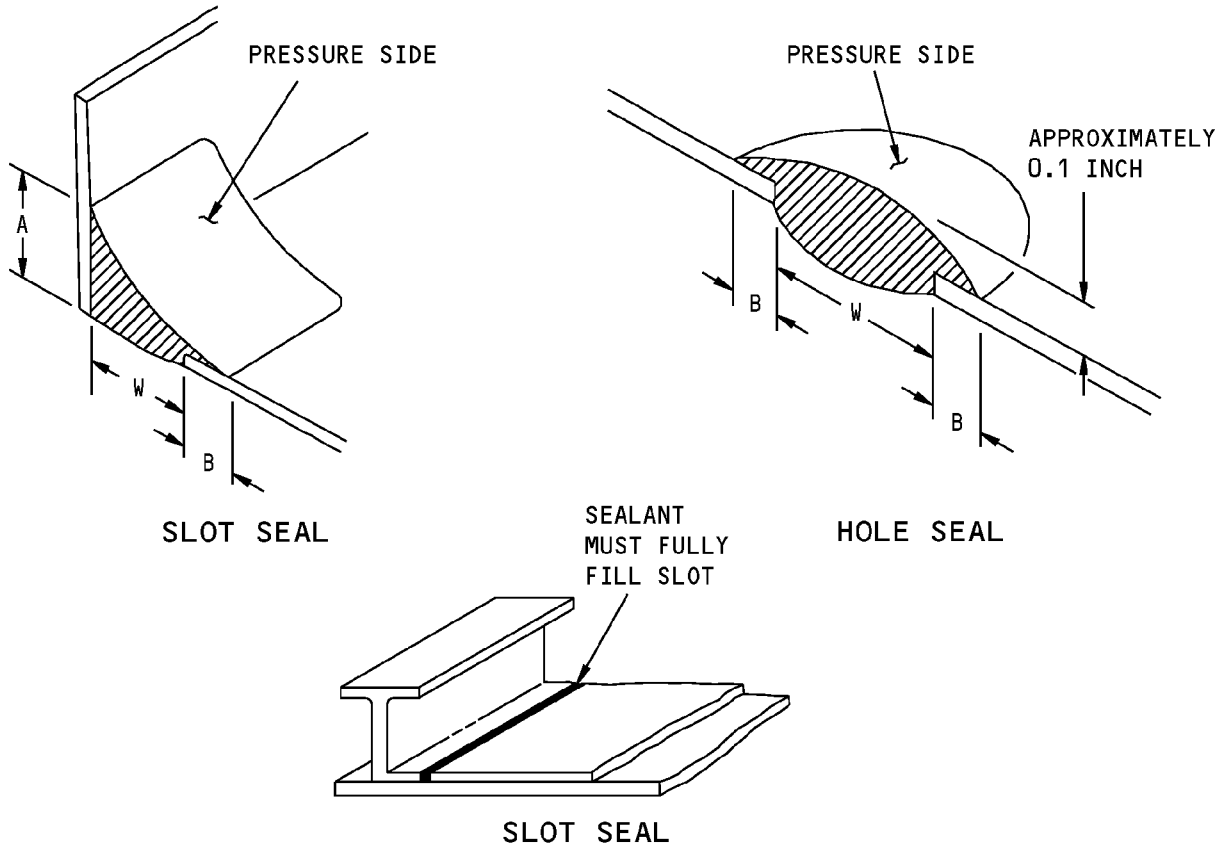
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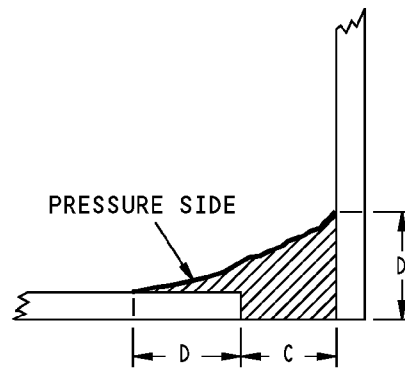
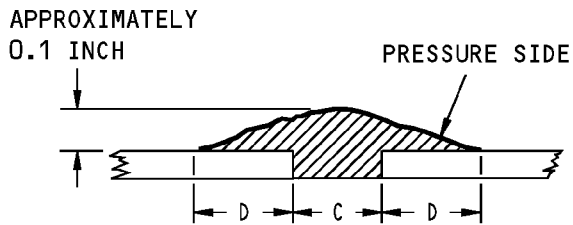
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A = 0.25 INCH MINIMUM AND NOT LESS THAN W
 W = 0.25 INCH MAXIMUM FOR DUCT AND PRESSURE SEAL
 W = 0.50 INCH MAXIMUM FOR WEATHER AND FUEL SEAL
 B = 0.25 INCH MINIMUM
 IF W IS 0.1 INCH OR LESS, NO COMPOUND IS NECESSARY



NOTE: D = 0.25 INCH MINIMUM BUT NOT LESS THAN W
 C = 0.50 INCH MAXIMUM

HOLE FILLING

HOLE FILLING

**Hole and Slot Seal
 Figure 203/51-31-00-990-803**

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TASK 51-31-00-390-804

8. Fillet Seal Application

(Figure 204)

A. Tools/Equipment

Reference	Description
STD-449	Gun - Sealant
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic

B. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G01061	Water - Distilled	

C. Procedure

SUBTASK 51-31-00-390-006

- (1) Apply the sealant with a sealant gun, STD-449.

NOTE: To keep the sealant from bonding to the tools, make the tool wet with a noncontaminating solution. Use a solution of one part (by volume) alcohol, B00130 and 5 parts (by volume) distilled water, G01061.

- (a) Put the nozzle tip into the seam.
- (b) Keep the tip vertical to the line of travel.
- (c) Make sure the sealant is applied in a straight line.
- (d) Push the bead of the sealant forward of the nozzle head.
- (e) Push the sealant tightly into position with the hardwood or plastic fillet smoothing spatula, STD-810.

NOTE: Make sure you get a smooth fillet.

- (f) Apply the sealant again to get a full body fillet.

NOTE: A second application of the sealant is necessary only for integral fuel tanks. You can cut the nozzle tip to give the full body seal some contour.

- (g) Use a hardwood or plastic fillet smoothing spatula, STD-810 to get the last shape of the fillet.
 - 1) Push the hardwood or plastic fillet smoothing spatula, STD-810 against the sealant and move the hardwood or plastic fillet smoothing spatula, STD-810 parallel to the bead.
 - 2) Make sure the seal is smooth.
- (h) Make sure there are no air bubbles in the seal.
- (i) Make sure the bead has the shape of a faired fillet, after the work is completed.

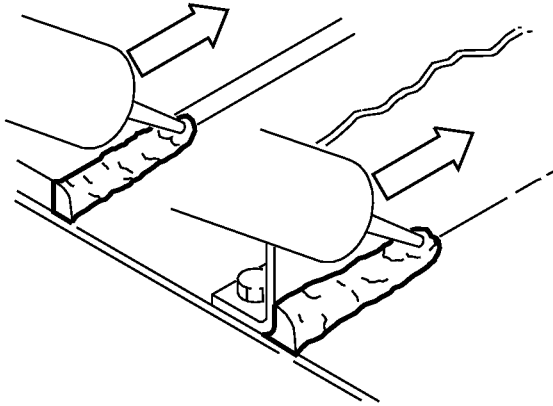
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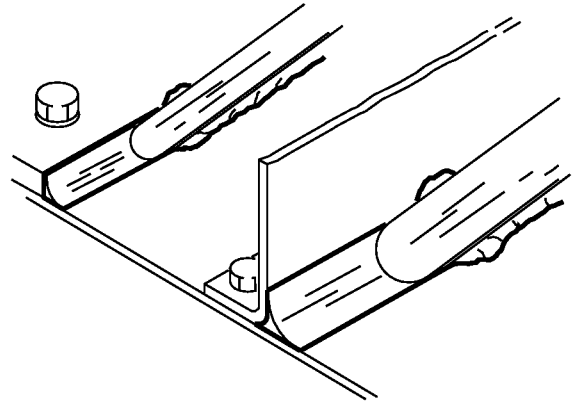
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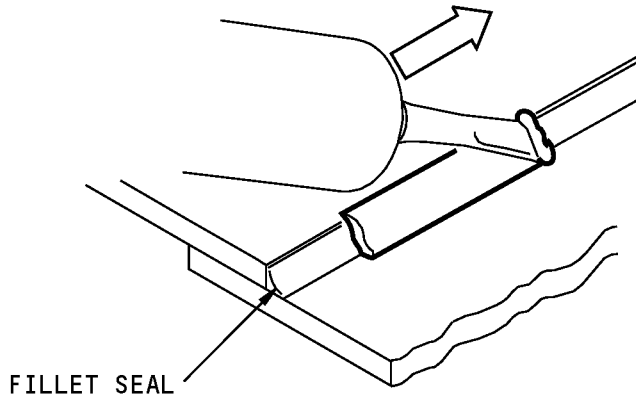


STEP 1 **1** 
(APPLICATION)





STEP 2 **2** 
(FINISH)

FILLET SEAL



**APPLICATION OF FILLET
FULL BODY SEAL**

- 1**  APPLY THE SEALANT WITH A SEALANT GUN
- 2**  USE A FAIRING TOOL THAT IS NOT LUBRICATED TO PUSH THE SEALANT INTO POSITION

Fillet Seal
Figure 204 (Sheet 1 of 2)/51-31-00-990-804

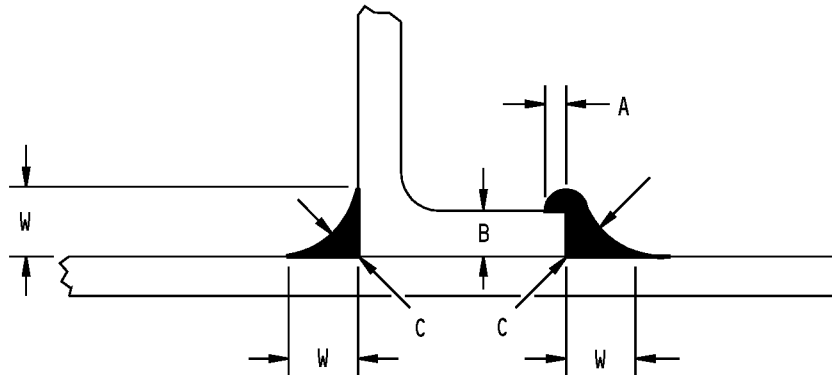
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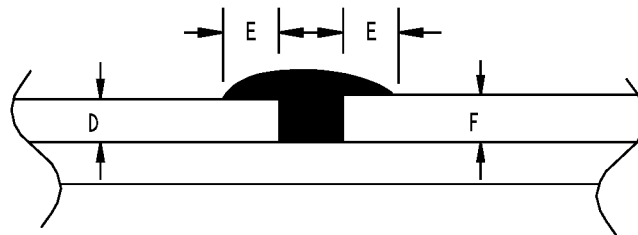
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C = 0.08 INCH MINIMUM
W = 0.15 TO 0.25 INCH
A+B = W EXCEPT A = 0 WHEN B = 0.15 INCH OR MORE



E+D (OR F) = 0.15 TO 0.25 INCH EXCEPT E = 0
WHEN THE ADJACENT D OR F IS 0.15 INCH OR MORE

SEALANT FILLETS

**Fillet Seal
Figure 204 (Sheet 2 of 2)/51-31-00-990-804**

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TASK 51-31-00-390-812

9. Fillet Seals Repair

A. General

- (1) Do this task to repair the damaged fillet sealant. There are steps for repairing sealant before and after the application time expires.
- (2) Refer to Repair of Insufficient Faying (Mated) Sealant Squeeze Out at Fuselage Shear Tie and Stringer Locations, TASK 51-31-00-390-811 to repair sealant in the areas where too small or no fillet is present.

B. Procedure

SUBTASK 51-31-00-390-032

- (1) Do these steps to repair the fillet sealant before the sealant application time expires:
 - (a) Remove the damaged fillets
 - (b) Do this task to apply new sealant: Fillet Seal Application, TASK 51-31-00-390-804

SUBTASK 51-31-00-390-033

- (2) Do these steps to repair the fillet sealant after the sealant application time expires:
 - (a) Remove the fillet completely or cut out the bad areas to let solid sealant stay.

NOTE: Be sure to cut the sealant with an approved scraper to prevent damaging the surface of the part. Make sure the cuts are clean and include notches for access.
 - (b) Remove loose chunks or flaps of sealant from the cut area.
 - (c) Do this task to clean the area: Prepare For Sealing, TASK 51-31-00-160-801.
 - (d) Do this task to apply new sealant: Fillet Seal Application, TASK 51-31-00-390-804

————— **END OF TASK** —————

TASK 51-31-00-390-805

10. Fastener Seal Application

(Figure 205)

A. General

- (1) If the fasteners were installed during the pot life of the sealant, sealing is not necessary.
- (2) Install rivets dry, unless you are told differently.

NOTE: Install 5056 aluminum rivets wet with sealant in an aluminum structure. Install 5056 aluminum rivets dry in a magnesium structure.

- (3) Use the specified procedure for fastener sealing for corrosion protection.

NOTE: When a procedure is not specified, use procedure 1.

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B. Fastener Sealing

SUBTASK 51-31-00-390-007

CAUTION: DO NOT CAUSE A BLOCKAGE WHEN YOU APPLY SEALANT NEAR OR AROUND THE FUSELAGE DRAIN HOLES, TUBES, OR PATHS. THE FUNCTION OF THE DRAIN HOLES IS TO DRAIN CONDENSATION AND FLUIDS OVERBOARD. IF YOU CAUSE A BLOCKAGE, FLUIDS WILL COLLECT IN THE AIRPLANE. THE FLUIDS CAN CAUSE CORROSION TO THE STRUCTURE, OR A FIRE IF THE FLUIDS ARE FLAMMABLE.

- (1) Use one of the steps that follow to seal the fasteners that are installed through the faying (mated) surface:

NOTE: These steps apply when the sealant pot life has ended or when no faying (mated) surface sealant is used.

- (a) Apply the sealant to the fastener or hole at the installation of the fastener.
 - 1) The extruded sealant must be continuous to show the area is sealed.
- (b) Apply the sealant to the fastener after it was installed.
 - 1) Make the sealant smooth around the fastener after it was installed.
- (c) Put on the metal seal covers (filled with sealant) to seal fasteners as follows:

NOTE: Metal seal covers must not touch the structure that is made with graphite fiber. This is to prevent corrosion.

NOTE: Fill the metal cover between 1/2 to 2/3 full of the sealant.

- 1) Put the metal seal on the fasteners until the flange touches the structure.

NOTE: The sealant must extrude out of the openings.

- 2) Remove the unwanted sealant from the top of the metal cover
- 3) Make the sealant smooth around the base of the metal cover.

C. Fastener Sealing for Corrosion Protection

SUBTASK 51-31-00-160-005

- (1) Clean the surface, do this task, do this task: Prepare For Sealing, TASK 51-31-00-160-801.

SUBTASK 51-31-00-390-029

- (2) Use one of the procedures that follow to seal fasteners for corrosion protection:

- (a) Procedure 1 - corrosion protection below the head area of the fastener.
 - 1) Apply sealant to all surfaces and countersinks below the fastener head.
 - 2) Install fastener.
 - 3) A continuous extrusion of sealant is necessary around the fastener.
 - 4) Clean off unwanted sealant.

- (b) Procedure 2 - corrosion protection below the head area and shank of the fastener.

- 1) Apply sealant to the entire shank and thread of the fastener.

NOTE: Apply sealant to the shank only for fasteners which will use self-sealing nuts or collars.

- 2) Install fastener and nut or collar.
- 3) Clean off unwanted sealant.

- (c) Procedure 3 - corrosion protection below the head area and shank of the fasteners and the bottom attaching hardware.

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- 1) Apply sealant to the entire shank and thread of the fastener.
 - 2) Install the fastener.
 - a) A continuous extrusion of sealant is necessary around the base of the washer, if used under the fastener head.
 - 3) Install the nut or collar.
 - 4) A continuous extrusion of sealant is necessary around the fastener head, the washer (if used), and the bottom of the nut or collar.
 - 5) Clean off unwated sealant.
- (d) Apply fillet-sea to the installed fastener.
- 1) Use class A or class B (brushable) sealants.

NOTE: More sealant can be applied to the shank of the intalled fastener to get the necessary sealnt extrusion.

NOTE: Brush marks are permitted if the fillet-seal dimensions are met.

————— **END OF TASK** —————

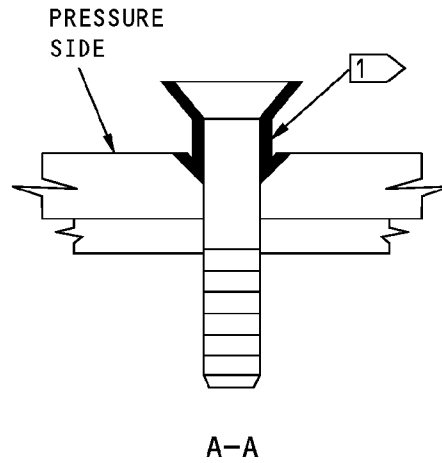
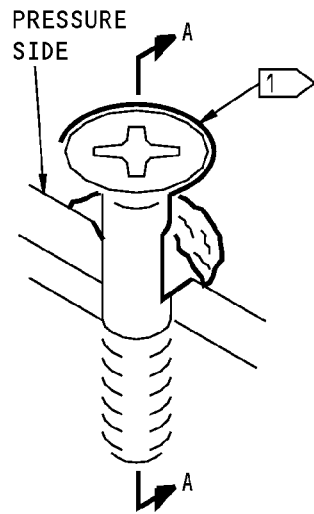
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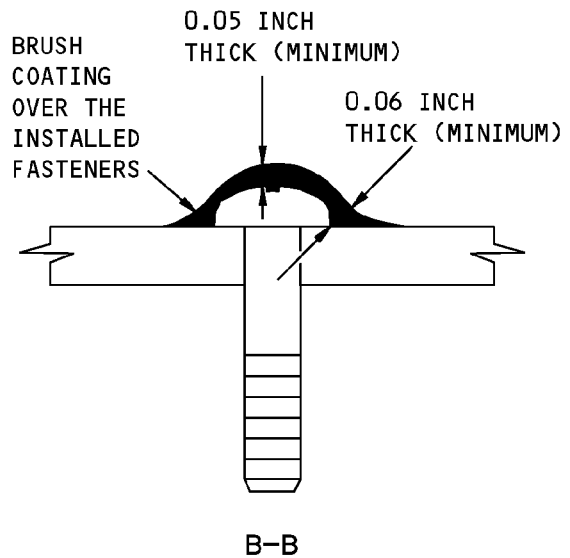
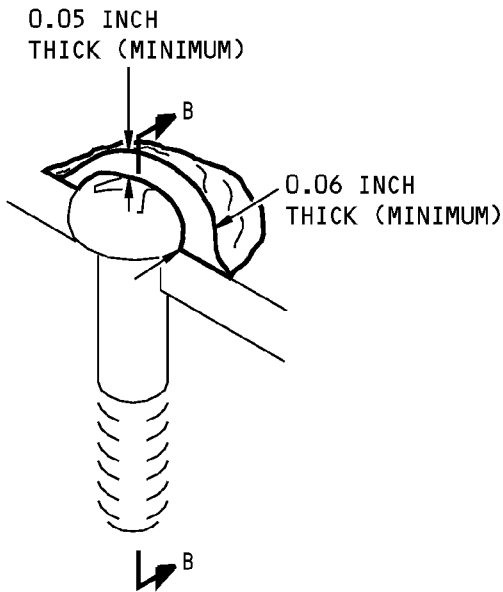
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**WET SEAL
DURING INSTALLATION**



SEAL AFTER INSTALLATION

1 YOU CAN APPLY SEALANT TO THE HOLE OR THE FASTENER

**Fastener Seal
Figure 205 (Sheet 1 of 5)/51-31-00-990-805**

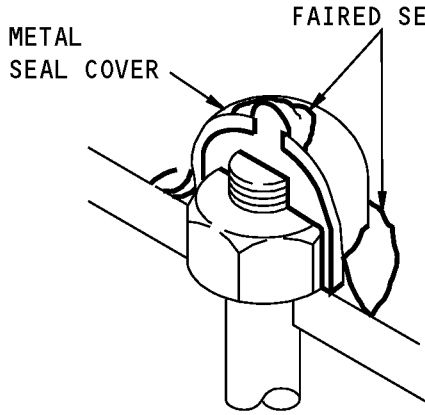
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HAP ALL

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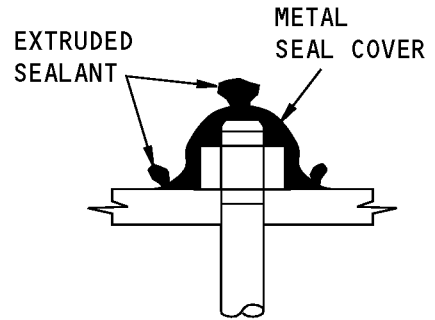
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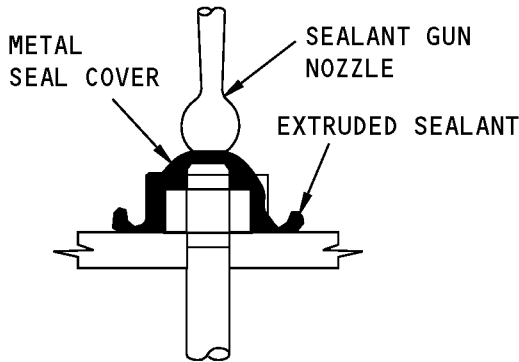
AIRCRAFT MAINTENANCE MANUAL



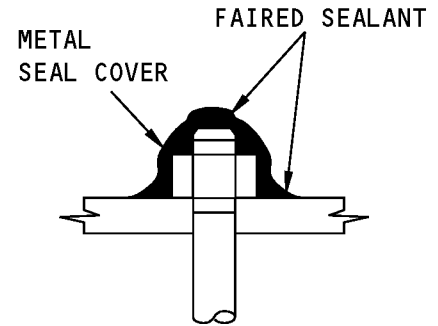
FAIRING SEAL AT THE METAL SEAL COVER



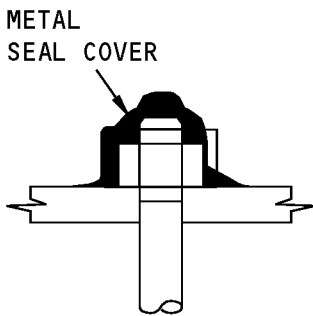
SEAL COVER AFTER AFTER INJECTION



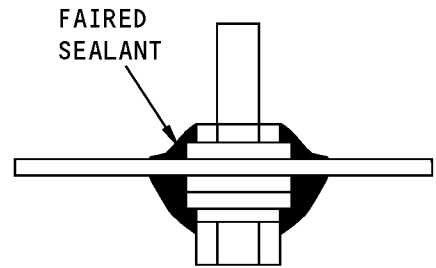
INJECTING SEALING SELF-CENTERING SEAL COVER



SEAL COVER AFTER FAIRING



AFTER FAIRING SELF-CENTERING SEAL COVER



SEALING OF STANDARD GROUND STUD

**Fastener Seal
Figure 205 (Sheet 2 of 5)/51-31-00-990-805**

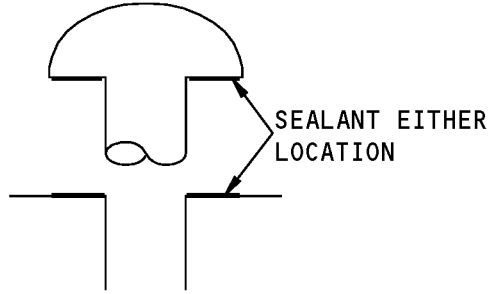
EFFECTIVITY
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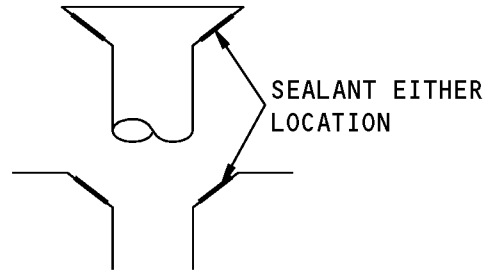
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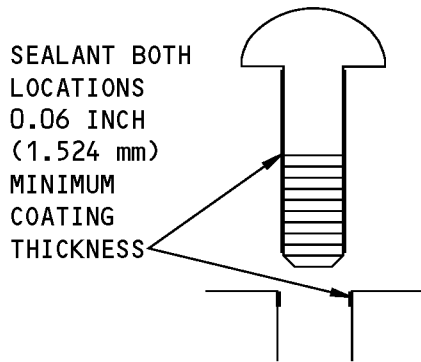


PROTRUDING HEAD FASTENER

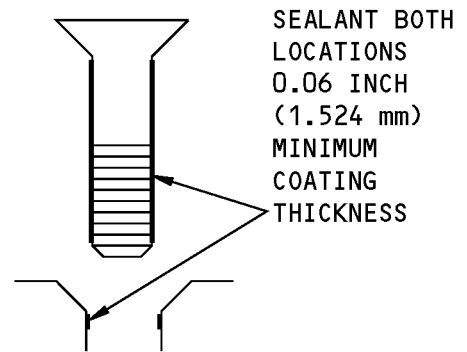


COUNTERSUNK FASTENER

PROCEDURE 1



PROTRUDING HEAD FASTENER



COUNTERSUNK FASTENER

PROCEDURE 2

TYPICAL FASTENER SEALING FOR CORROSION PROTECTION

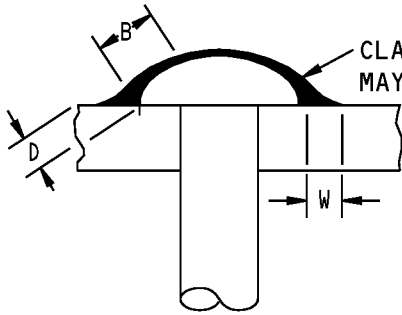
Fastener Seal
Figure 205 (Sheet 3 of 5)/51-31-00-990-805

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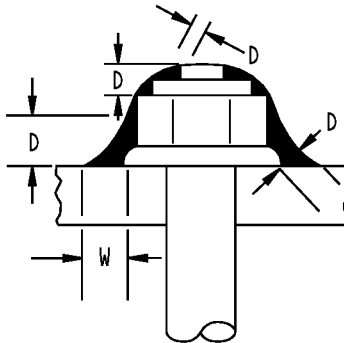
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RIVET HEAD AND BUTTON

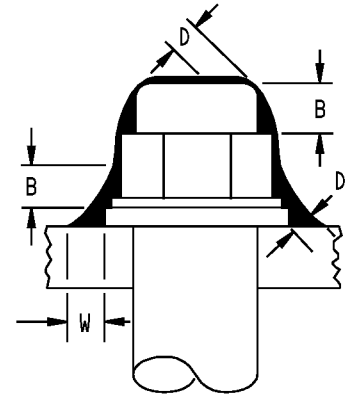
(A)

CLASS A (BRUSHABLE) IF USED, MAY COVER THE FASTENER HEAD



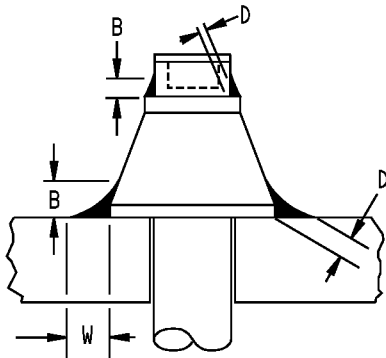
BOLT LESS THAN 1/2-INCH DIA

(B)



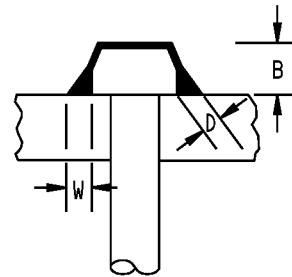
BOLT 1/2-INCH OR LARGER DIA

(C)



HEX DRIVE (HI-LOCK) COLLAR 1/2-INCH AND LARGER DIA BOLT

(D)



HEX DRIVE (HI-LOCK) BOLT/LOCKBOLT LESS THAN 3/8-INCH DIA

(E)

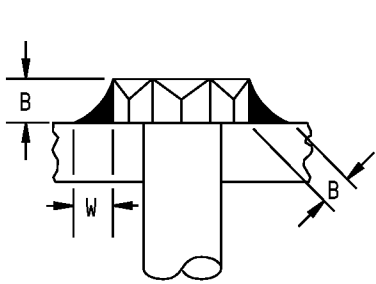
TYPICAL FILLET SEALING DIMENSIONS FOR CORROSION PROTECTION

Fastener Seal
Figure 205 (Sheet 4 of 5)/51-31-00-990-805

EFFECTIVITY
HAP ALL

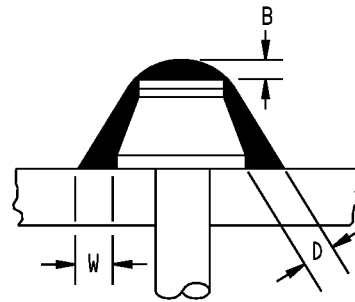
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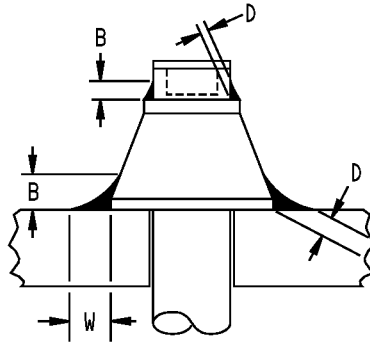
HEX DRIVE (HI-LOCK)/
BOLT/LOCKBOLT
3/8-INCH OR LARGER DIA

(F)



LOCK BOLT
COLLAR

(G)



HEX DRIVE (HI-LOCK) COLLAR
LESS THAN 1/2-INCH DIA BOLT 1

(H)

- 2 RECESSED AREA IN END OF HEX DRIVE PIN NEED NOT BE FILLED WITH SEALANT
 D = 0.02 INCH (0.508 mm) MINIMUM
 B = 0.10 INCH (2.54 mm) MINIMUM, EXCEPT 0.20 INCH (5.08 mm) MAXIMUM
 FOR VIEWS C, D, AND F.
 W = 0.10 INCH (2.54 mm) MINIMUM TO 0.20 INCH (5.08 mm) MAXIMUM

TYPICAL FILLET SEALING DIMENSIONS FOR CORROSION PROTECTION

Fastener Seal
Figure 205 (Sheet 5 of 5)/51-31-00-990-805

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TASK 51-31-00-390-806

11. Aerodynamic Smoother Application

(Figure 206)

A. Tools/Equipment

Reference	Description
STD-449	Gun - Sealant
STD-810	Spatula - Fillet Smoothing, Hardwood or Plastic

B. Consumable Materials

Reference	Description	Specification
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)

C. Procedure

SUBTASK 51-31-00-160-004

(1) Do this task: Prepare For Sealing, TASK 51-31-00-160-801.

SUBTASK 51-31-00-390-008

(2) Apply the aerodynamic smoother as follows:

(a) Apply the Scotch Flatback Masking Tape 250, G00270 to the surface that is adjacent to the damaged area.

CAUTION: DO NOT CAUSE A BLOCKAGE WHEN YOU APPLY SEALANT NEAR OR AROUND THE FUSELAGE DRAIN HOLES, TUBES, OR PATHS. THE FUNCTION OF THE DRAIN HOLES IS TO DRAIN CONDENSATION AND FLUIDS OVERBOARD. IF YOU CAUSE A BLOCKAGE, FLUIDS WILL COLLECT IN THE AIRPLANE. THE FLUIDS CAN CAUSE CORROSION TO THE STRUCTURE, OR A FIRE IF THE FLUIDS ARE FLAMMABLE.

CAUTION: WHEN YOU APPLY THE AERODYNAMIC SMOOTHER TO THE WING-TO-BODY FAIRINGS, YOU MUST LIMIT YOUR APPLICATIONS TO THE LOCATIONS SHOWN IN AMM 51-41-11. THE CLEARANCES BETWEEN THE FAIRING PANELS ARE MADE TO LET THE FLUIDS IN THE FAIRING TO DRAIN SUFFICIENTLY OVERBOARD.

(b) Apply the aerodynamic smoother with a sealant gun, STD-449 or a hardwood or plastic fillet smoothing spatula, STD-810.

NOTE: Make sure there are no air bubbles when you apply the aerodynamic smoother.

(c) When it is necessary, apply more of the aerodynamic smoother to make the edges around the seal smooth.

NOTE: Because of sealant shrinkage, you must apply the aerodynamic smoother again. Do this approximately 8 hours after the first application of the sealant.

(d) Use a hardwood or plastic fillet smoothing spatula, STD-810 to make the seal smooth with the edge of the Scotch Flatback Masking Tape 250, G00270.

(e) Remove the Scotch Flatback Masking Tape 250, G00270 after the sealant is smooth and dry.

(f) Make the edges of the seal smooth.

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- 1) Remove all the unwanted compound with an approved sealant removal tool listed in this task: Prepare For Sealing, TASK 51-31-00-160-801.

————— **END OF TASK** —————

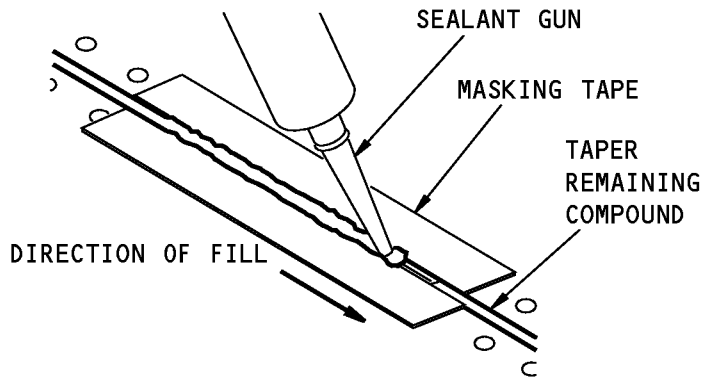
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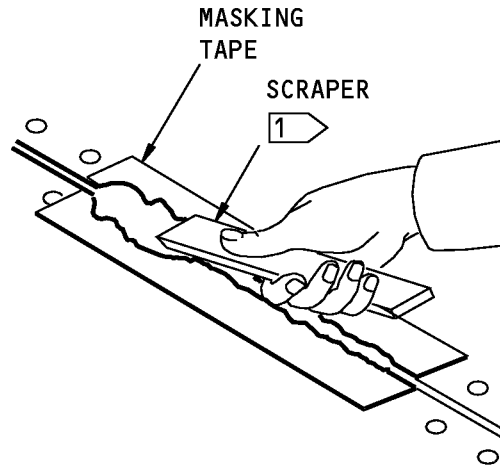
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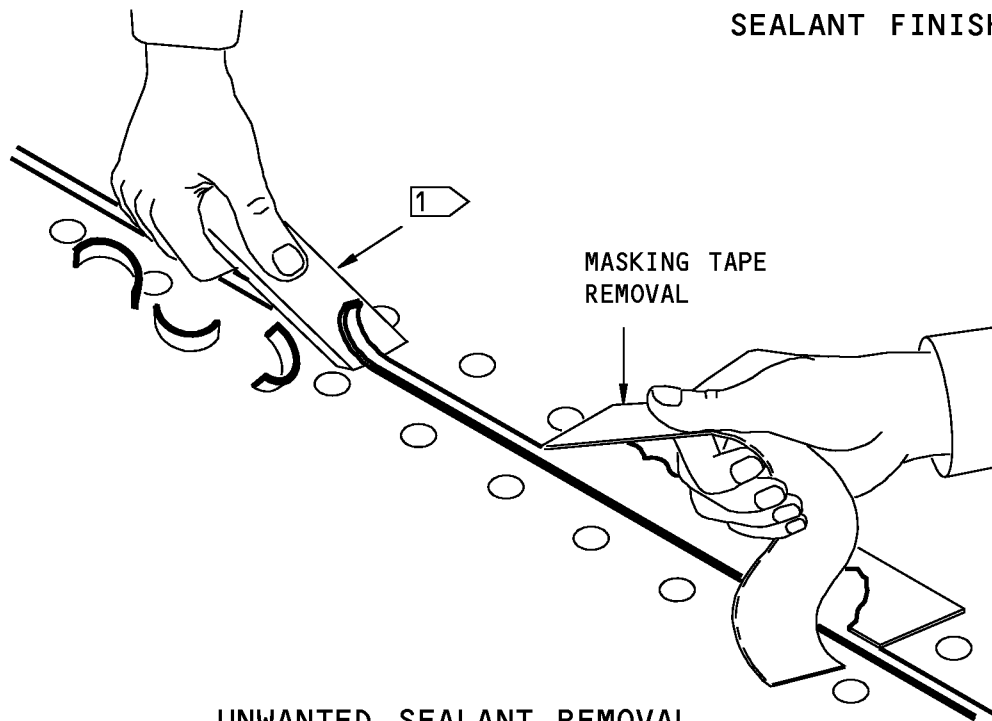
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SEALANT APPLICATION



SEALANT FINISH



UNWANTED SEALANT REMOVAL

1 USE AN APPROVED NON METALLIC SEALANT REMOVAL TOOL TO REMOVE UNWANTED SEALANT AFTER THE SEALANT HAS CURED

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Aerodynamic Seal

Figure 206 (Sheet 1 of 2)/51-31-00-990-806

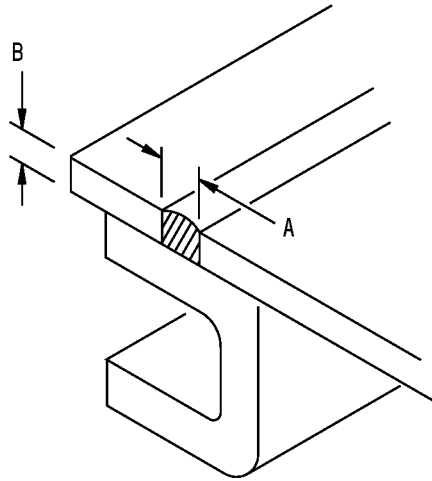
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WIDTH B (INCHES)	WIDTH A (INCHES)
0.10 MAXIMUM	0.02-0.03
0.25 MAXIMUM	0.03-0.05
0.50 MAXIMUM	0.05-0.10
0.75 MAXIMUM	0.10-0.15

SLOT WIDTH AND DEPTH

**Aerodynamic Seal
Figure 206 (Sheet 2 of 2)/51-31-00-990-806**

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TASK 51-31-00-390-807

12. Electrical Fitting Seal Application

(Figure 207)

A. General

- (1) compound, A00230 is the recommended sealant for the electrical fittings seal.

NOTE: Use sealant, A00767 sealant only on Teflon insulated wire where compound, A00230 or sealant, A00247 are specified.

- (a) sealant, A00767, and sealant, A00247 sealants will do the same function as the compound, A00230 on wires that do not have a teflon coating.

NOTE: The compound, A00230, and sealant, A00247 are not the recommended sealants for wires with a teflon coating. These sealants will bond to electrical wires which do not have a teflon coating. It is not easy to do maintenance on electrical seal fittings that have sealant bonded to the electrical wires.

B. Tools/Equipment

Reference	Description
STD-449	Gun - Sealant

C. Consumable Materials

Reference	Description	Specification
A00230	Compound - Electrical Insulating Coating	BMS 5-37
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
A00767	Sealant - Fuel Tank	BMS5-45
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)

D. Apply the Sealant to the Electrical Fittings.

SUBTASK 51-31-00-390-009

- (1) Seal the multiple cutouts in the primary sealing areas as follows:

- (a) Put the wire bundle through an available cutout.
- (b) Isolate the wires before you apply the seal.
 - 1) If there are three or less wires, use the plastic separators to isolate the wires.
 - 2) If there are four or more wires, use the wire coil separators to isolate the wires.
- (c) Wind the wire coil separators two to four turns around each wire.

- (d) Assemble the fitting together around the wires.

NOTE: Make sure the flange of the fitting is on the pressurized side of the airplane.

NOTE: A fitting is made of two halves.

- (e) Make sure the plastic separators or the wire coil separator is satisfactorily installed on the wires in the bulkhead fitting.
- (f) Put an 8-inch long string against the bulkhead fitting and parallel with the wires.
- (g) Wind three turns of 1 1/2-inch (3.8 cm) wide Scotch Flatback Masking Tape 250, G00270 around the fitting.

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- (h) Crimp the 1 1/2-inch wide (3.8 cm) Scotch Flatback Masking Tape 250, G00270 around the bulkhead fitting.

NOTE: Make sure the wires are in the center of the bulkhead fitting and the Scotch Flatback Masking Tape 250, G00270.

- (i) Wind three turns of 3/4-inch (1.9 cm) wide Scotch Flatback Masking Tape 250, G00270 around the 1 1/2-inch (3.8 cm) wide Scotch Flatback Masking Tape 250, G00270.
- (j) Put the bulkhead fitting, cover plate and the filler in position on the unpressurized side of the airplane.
- (k) Install the fasteners.
- (l) Make an injection hole in the 1 1/2-inch (3.8 cm) wide Scotch Flatback Masking Tape 250, G00270 at an applicable location.
- (m) Use the sealant gun, STD-449 to apply the sealant.
- 1) Apply the sealant until it comes out from the flange of the bulkhead fitting.
- (n) Apply the sealant to make a fillet seal on the filler.
- (o) Apply the sealant on the fastener that is in the center of the filler.
- (p) Let the sealant cure for a minimum of 16 to 24 hours.
- (q) Pull the string to remove the Scotch Flatback Masking Tape 250, G00270.

SUBTASK 51-31-00-390-010

- (2) Seal the multiple cutouts in the intermediate sealing areas.

NOTE: Do not use the coil spacers.

- (a) Put the wire bundle through an available cutout.
- (b) Isolate the wires before you apply the seal.
- 1) If there are three or less wires, use the plastic separators to isolate the wires.
- (c) Assemble the fitting together around the wires.

NOTE: Make sure the flange of the fitting is on the pressurized side of the airplane.

NOTE: A fitting is made of two halves.

- (d) Put an 8-inch (20 cm) long string against the bulkhead fitting and parallel with the wires.
- (e) Wind three turns of 1 1/2-inch (3.8 cm) wide Scotch Flatback Masking Tape 250, G00270 around the fitting.
- (f) Crimp the 1 1/2-inch (3.8 cm) wide Scotch Flatback Masking Tape 250, G00270 around the bulkhead fitting.

NOTE: Make sure the wires are in the center of the bulkhead fitting and the Scotch Flatback Masking Tape 250, G00270.

- (g) Wind three turns of 3/4-inch (1.9 cm) wide Scotch Flatback Masking Tape 250, G00270 around the 1 1/2-inch (3.8 cm) wide Scotch Flatback Masking Tape 250, G00270.
- (h) Put the bulkhead fitting in position on the unpressurized side of the airplane.
- (i) Install the fasteners.
- (j) Make an injection hole in the 1 1/2-inch (3.8 cm) wide Scotch Flatback Masking Tape 250, G00270 at an applicable location.
- (k) Use the sealant gun, STD-449 to apply the sealant.
- 1) Apply the sealant until it comes out from the flange of the bulkhead fitting.

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- (l) Apply the sealant to make a fillet seal on the filler.
- (m) Apply the sealant on the fastener that is in the center of the filler.
- (n) Let the sealant cure for a minimum of 16 to 24 hours.
- (o) Pull the string to remove the Scotch Flatback Masking Tape 250, G00270.

SUBTASK 51-31-00-390-011

- (3) Seal the single cutouts in the primary or intermediate areas.

NOTE: Do not use the seal plate or filler.

- (a) Put the wire bundle through an available cutout.
- (b) Isolate the wires before you apply the seal:
 - 1) If there are three or less wires, use the plastic separators to isolate the wires.
 - 2) If there are four or more wires, use the wire coil separators to isolate the wires.
- (c) Wind the wire coil separators two to four turns around each wire.
- (d) Assemble the fitting together around the wires.

NOTE: Make sure the flange of the fitting is on the pressurized side of the airplane.

NOTE: A fitting is made of two halves.

- (e) Make sure the plastic separators or the wire coil separator is satisfactorily installed on the wires in the bulkhead fitting.
- (f) Put an 8-inch (20 cm) long string against the bulkhead fitting and parallel with the wires.
- (g) Wind three turns of 1 1/2-inch (3.8 cm) wide Scotch Flatback Masking Tape 250, G00270 around the fitting.
- (h) Crimp the 1 1/2-inch (3.8 cm) wide Scotch Flatback Masking Tape 250, G00270 around the bulkhead fitting.

NOTE: Make sure the wires are in the center of the bulkhead fitting and the Scotch Flatback Masking Tape 250, G00270.

- (i) Wind three turns of 3/4-inch (1.9 cm) wide Scotch Flatback Masking Tape 250, G00270 around the 1 1/2-inch wide (3.8 cm) Scotch Flatback Masking Tape 250, G00270.
- (j) Put the bulkhead fitting, cover plate and the filler in position on the unpressurized side of the airplane.
- (k) Install the fasteners.
- (l) Make an injection hole in the 1 1/2-inch (3.8 cm) wide Scotch Flatback Masking Tape 250, G00270 at an applicable location.
- (m) Use the sealant gun, STD-449 to apply the sealant.
 - 1) Apply the sealant until it comes out from the flange of the bulkhead fitting.
- (n) Apply the sealant to make a fillet seal on the filler.
- (o) Apply the sealant on the fastener that is in the center of the filler.
- (p) Let the sealant cure for a minimum of 16 to 24 hours.
- (q) Pull the string to remove the Scotch Flatback Masking Tape 250, G00270.

————— **END OF TASK** —————

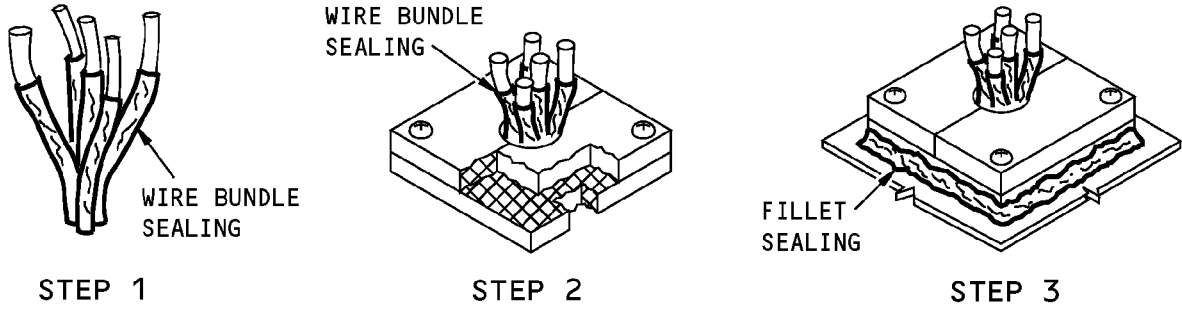
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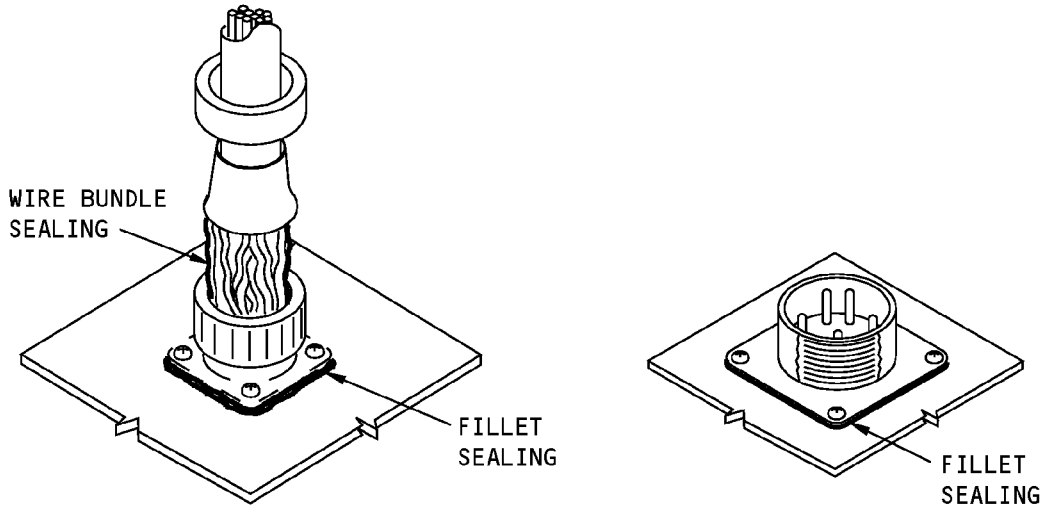
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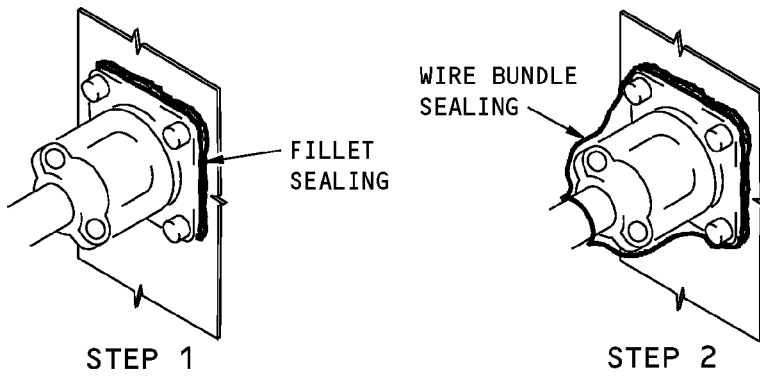


EXAMPLE A



EXAMPLE B

EXAMPLE B



EXAMPLE C

WIRE BUNDLE SEALING

Electrical Fitting Seal

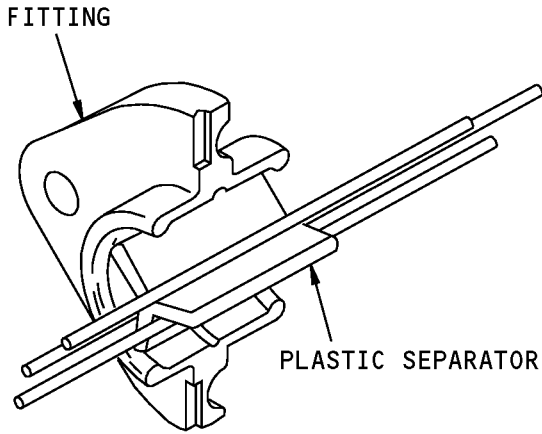
Figure 207 (Sheet 1 of 3)/51-31-00-990-807

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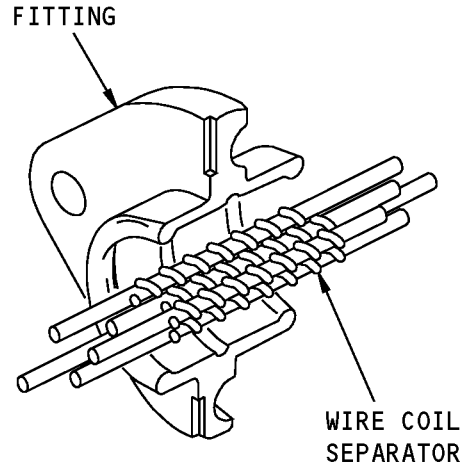
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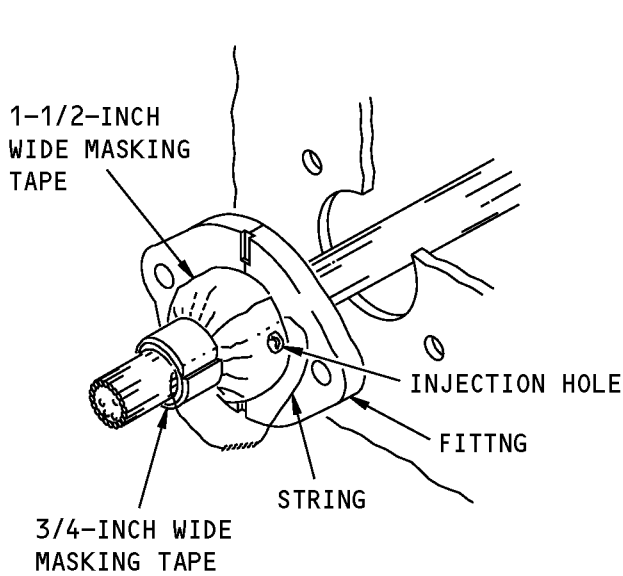
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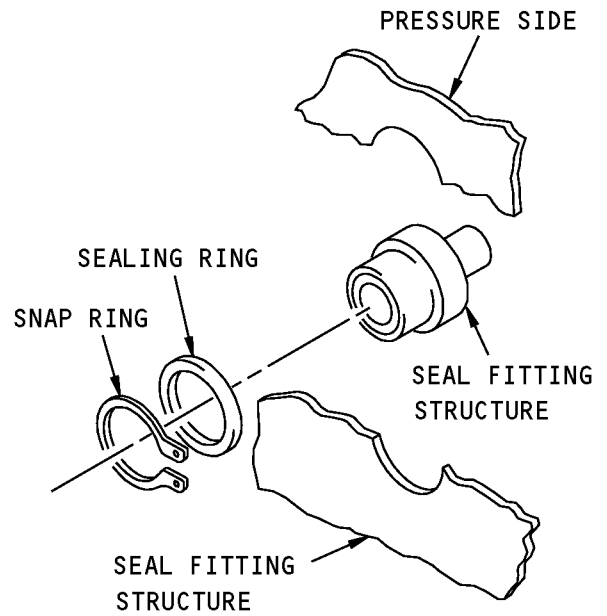
**PLASTIC SEPARATOR
INSTALLATION**



**WIRE COIL SEPARATOR
INSTALLATION**



**BULKHEAD FITTING
(BACS45A)**



**BULKHEAD FITTING
(BACS45B)**

**Electrical Fitting Seal
Figure 207 (Sheet 2 of 3)/51-31-00-990-807**

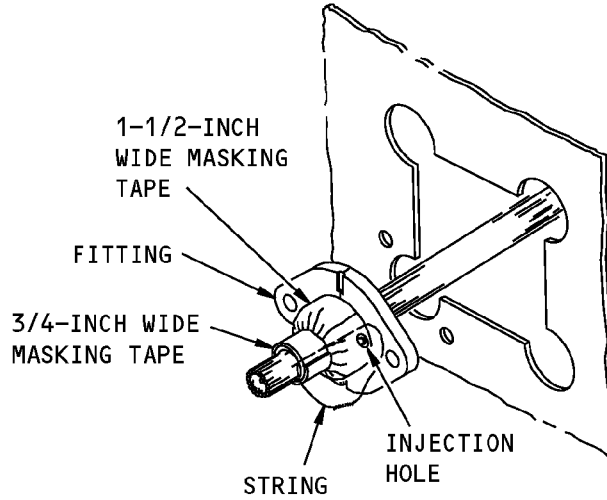
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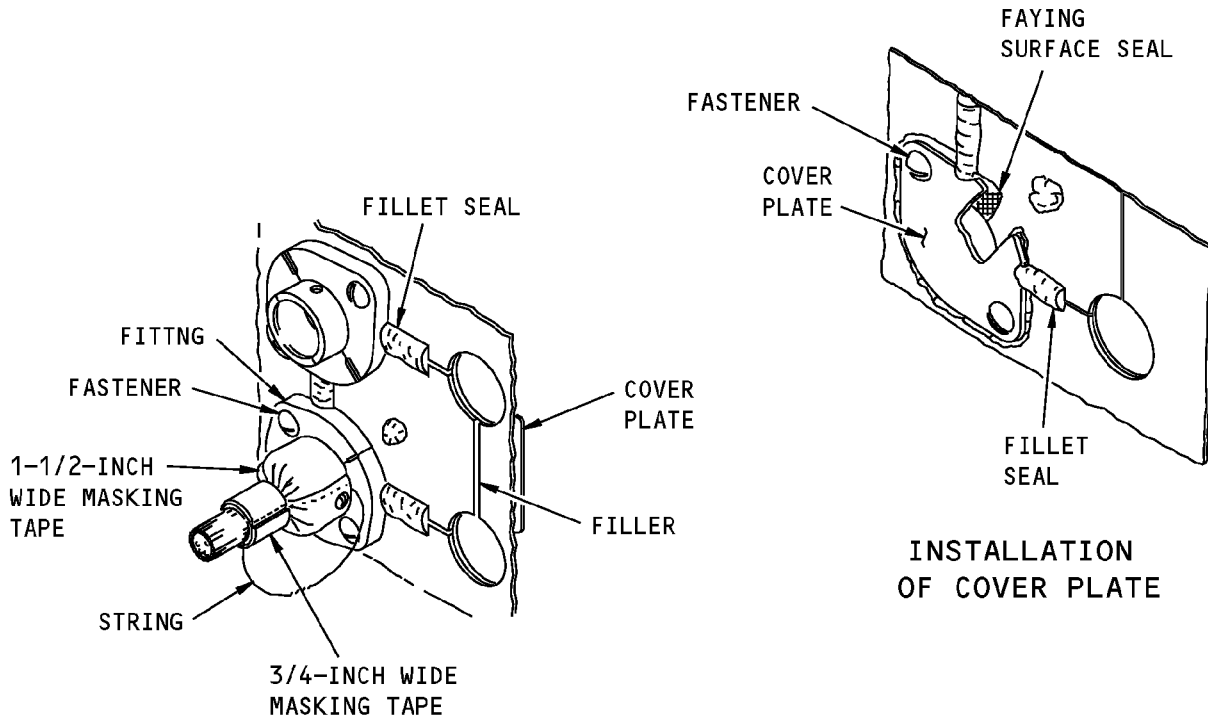
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ASSEMBLY OF BULKHEAD FITTING



INSTALLATION OF BULKHEAD FITTING

INSTALLATION OF COVER PLATE

Electrical Fitting Seal

Figure 207 (Sheet 3 of 3)/51-31-00-990-807

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TASK 51-31-00-390-808

13. Fuel Seal Application

A. References

Reference	Title
28-11-00-300-804	Approved Repair of the Secondary Fuel Barrier Sealant (P/B 801)

B. Procedure

SUBTASK 51-31-00-390-012

- (1) Do this task: Approved Repair of the Secondary Fuel Barrier Sealant, TASK 28-11-00-300-804.

NOTE: The dry bay access panels are sealed with the "Fillet Seal Application" and "Fastener Seal Application" tasks.

————— END OF TASK —————

TASK 51-31-00-370-801

14. Protection of Sealant Materials

A. Procedure

SUBTASK 51-31-00-620-001

- (1) Keep the sealant materials away from grease, oil, dirt, metal particles and all unwanted materials.

SUBTASK 51-31-00-370-001

- (2) After the sealant is tack-free, put a protective cover on the sealing area for protection.

NOTE: Do not apply a primer to silicone sealants. The primer does not bond to silicone sealants.

- (a) Apply the primer as shown in Application of Protective Primers (Table 201).

Table 201/51-31-00-993-808 Application of Protective Primers

APPLICATION OF PROTECTIVE PRIMERS	
Sealant Class	Sealant Dry Time
Class A	When sealant is tack free
Class B and D	Immediately after application
Class C	Immediately after completion of assembly of the structure
Class E	4 hours minimum after application
Class G	Immediately after completion of assembly of the structure

————— END OF TASK —————

TASK 51-31-00-390-809

15. Accelerated Curing

(Figure 201, Figure 202, Figure 203, Figure 204, Figure 205, Figure 206, Figure 207)

A. Tools/Equipment

Reference	Description
STD-3925	Heater - Blower, Explosion Proof, Electric

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B. Procedure

SUBTASK 51-31-00-390-013

(1) Use one of the steps that follow to accelerate the cure:

CAUTION: MAKE SURE THE TEMPERATURE IS BELOW 120°F. IF THE TEMPERATURE IS ABOVE 120° F (48.9°C), BUBBLES WILL OCCUR ON THE SEALANT.

- (a) Use explosion proof electric blower - heater, STD-3925 or heat lamps to apply heat to the sealant.
- (b) Make the airplane structure warm after you apply the sealant.

————— END OF TASK —————

TASK 51-31-00-100-801

16. Chemical Sealant Removal

A. References

Reference	Title
20-30-02-910-801	Structure Cleaners and Polishes (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-4746	Handle - Sealant Removal Tool (Part #: 310/1, Supplier: KA861, A/P Effectivity: 737-ALL) (Part #: SHN0272, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: SHR0272-T, Supplier: 1DWR5, A/P Effectivity: 737-ALL)
STD-763	Scraper
STD-4406	Brush - Bristle, Soft, Natural

C. Consumable Materials

Reference	Description	Specification
E00002	Stripper - Paint - Turco 5351	
E50004	Cee-Bee E-1058 polysulfide sealant and paint stripper	
E50005	Skykleen 2000 polysulfide sealant removal paste	BAC5750 PSD 6-80, PSD 9-22
E50006	Naftosolv FN polysulfide sealant removal stripper	
E50007	Eldorado PR-5044 peroxide stripper	BAC 5725, D6-17487
E50008	Skyrestore (thick) sealant stripper	
G50256	Water, Regular	
G50262	Wiper - Cleaning	BMS15-5

D. Procedure

SUBTASK 51-31-00-140-001

(1) Remove sealant fillet with a sealant tool removal handle, COM-4746 and an approved scraper, STD-763.

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SUBTASK 51-31-00-950-001

(2) Mask surrounding areas as necessary to prevent contact with chemical strippers.

NOTE: Do not allow chemical strippers to contact substrates other than aluminum.

NOTE: Do not use chemical strippers on reverse lap joints.

NOTE: Chemical strippers will soften and remove paint.

SUBTASK 51-31-00-940-002

(3) Use one of the following chemical strippers to remove the sealant:

- Turco 5351 stripper, E00002
- Cee-Bee E-1058 stripper, E50004
- Skykleen 2000 stripper, E50005
- Naftoslov FN stripper, E50006
- Eldorado PR-5044 PR-5044 stripper, E50007
- Skyrestore (thick) stripper, E50008.

SUBTASK 51-31-00-110-001

(4) Chemically strip any sealant remaining on the surface as follows:

- (a) Using a natural bristle brush, STD-4406, apply a thin coating of chemical stripper on the sealant.
- 1) Do not apply excessive chemical stripper.
 - a) Stripper should hang and not flow.
 - 2) Let the stripper dwell until the sealant can be easily removed by dry wiping, but do not exceed 40 minutes.
 - 3) Remove softened sealant with clean dry wiper, G50262.
 - a) Approved scrapers may be used to facilitate removal.

SUBTASK 51-31-00-160-007

(5) After chemical stripping is complete, remove stripper by thoroughly washing with a water-based alkaline cleaner (Ref Structure Cleaners and Polishes, TASK 20-30-02-910-801).

SUBTASK 51-31-00-160-008

(6) Rinse area thoroughly with water, G50256.

————— **END OF TASK** —————

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EXTERNAL DRAINAGE - INSPECTION/CHECK

1. General

A. This procedure contains the following tasks:

- (1) External drainage inspection/check.
- (2) Ball drain valve inspection/check.

B. Examine the external drains regularly to prevent possible fire or corrosion.

TASK 51-41-11-200-801

2. External Drainage Inspection/Check

(Figure 601)

A. References

Reference	Title
51-41-13-020-801	Remove the Drain Valve (P/B 401)

B. Consumable Materials

Reference	Description	Specification
B00003	Cleaner - Emulsion Alkaline - GMC 528B	
B00402	Cleaner - Aerospace Equipment	MIL-PRF-87937
G01043	Cloth - Lint-free	

C. Examine the Removable Drain Valve

SUBTASK 51-41-11-210-001

- (1) Examine the removable drain valve.
 - (a) Examine the drain holes (with valves or with no valves) in the areas of body, wing, empennage, nacelle and control surfaces.
 - (b) Make sure the drains are free of unwanted materials.
 - (c) Clean the drains, if it is necessary.

D. Clean the Removable Drain Valves

SUBTASK 51-41-11-020-001

- (1) Remove the valve, do this task, do this task: Remove the Drain Valve, TASK 51-41-13-020-801.

SUBTASK 51-41-11-110-002

- (2) Clean the valve with a lint-free cloth, G01043 that is moist with GMC 528B cleaner, B00003 or cleaner, B00402.

SUBTASK 51-41-11-140-001

- (3) Use a rigid bristle to clean the valve.

SUBTASK 51-41-11-170-001

- (4) Flush the valve with clear.

SUBTASK 51-41-11-160-001

- (5) Remove unwanted materials from the drain paths in the valve retainer if the drain paths are not clear.

SUBTASK 51-41-11-210-002

- (6) Make sure the drain paths in the valve are clear.

SUBTASK 51-41-11-210-003

- (7) Make sure the plunger and the spring stay installed in the valve.

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E. Examine the Spring-Type Drain Valves

SUBTASK 51-41-11-210-004

- (1) Examine the spring-type drain valve.
(a) Make sure the spring valve is not in the closed position.
(b) Lightly push the valve open, if it is closed.
(c) Remove unwanted materials from the drain valve.

END OF TASK

TASK 51-41-11-200-802

3. Ball Drain Valve Inspection/Check

(Figure 602)

A. Consumable Materials

Table with 3 columns: Reference, Description, Specification. Rows include B00083 (Solvent - Aliphatic Naphtha), B00130 (Alcohol - Isopropyl), and G00034 (Cotton Wiper - Process Cleaning Absorbent Wiper).

B. Examine the Ball Drain Valves

SUBTASK 51-41-11-210-005

- (1) Examine the ball drain valves.
(a) Examine the ball drain valves in the wing center section rear spar.
(b) Make sure that the ball drain valves are clean.
(c) Make sure that the ball drain valves operate correctly.
(d) Clean the ball drain valves, if it is necessary.

C. Clean the Ball Drain Valves

SUBTASK 51-41-11-110-003

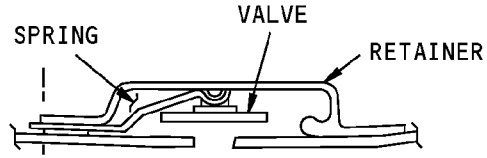
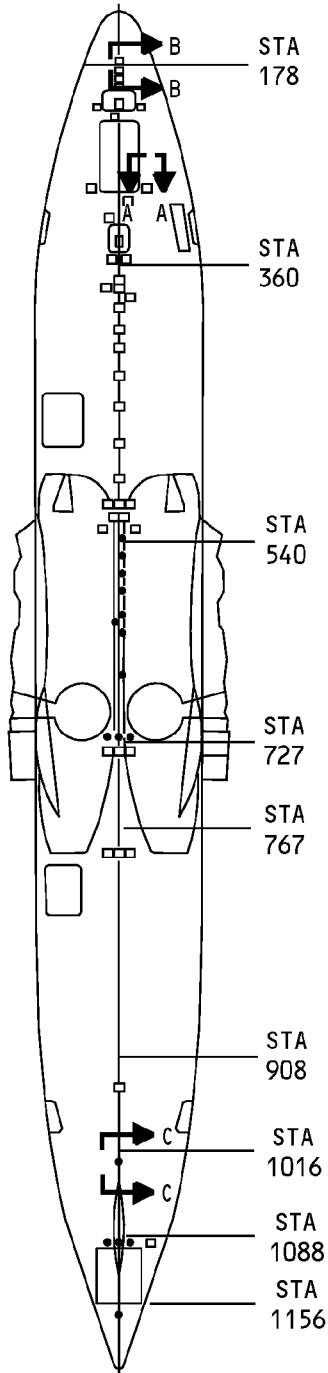
- (1) Clean the ball drain valves with a cloth cotton wiper, G00034 moist with solvent, B00083 or alcohol, B00130.
(a) Remove unwanted materials from ball drain valve housing.

END OF TASK

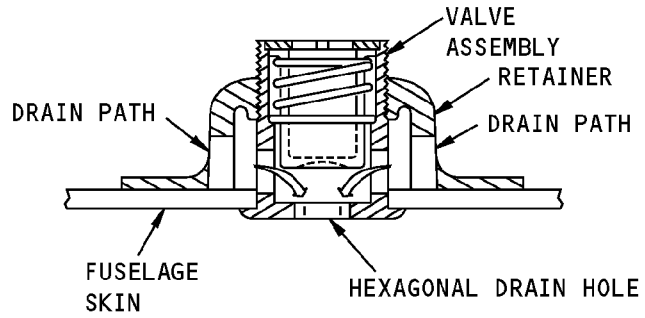
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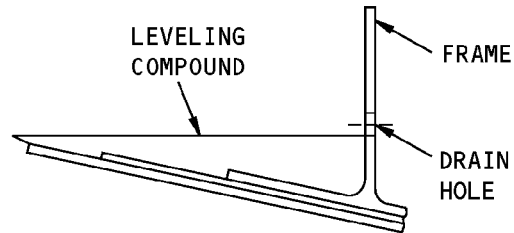


□ SPRING-TYPE DRAIN VALVE

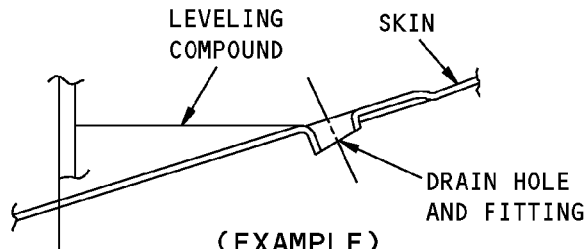


□ REMOVABLE DRAIN VALVE (35 INSTALLED)

(EXAMPLE)
A-A



(EXAMPLE)
B-B



(EXAMPLE)
C-C

BOTTOM VIEW OF THE FUSELAGE

NOTE: • SPECIAL TYPE DRAIN HOLE AS SHOWN
• OPEN DRAIN HOLE

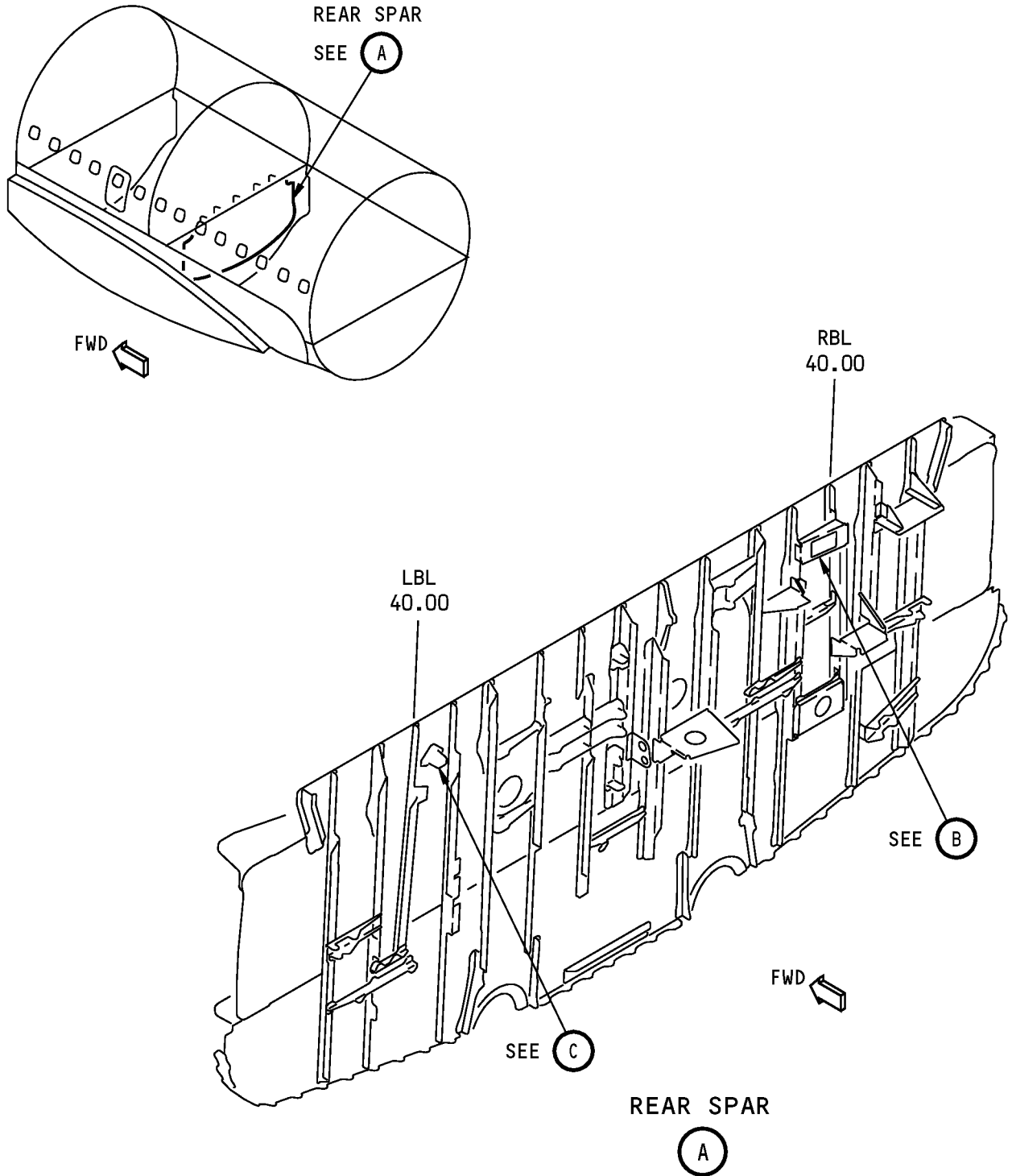
Airframe Drainage - Fuselage
Figure 601/51-41-11-990-801

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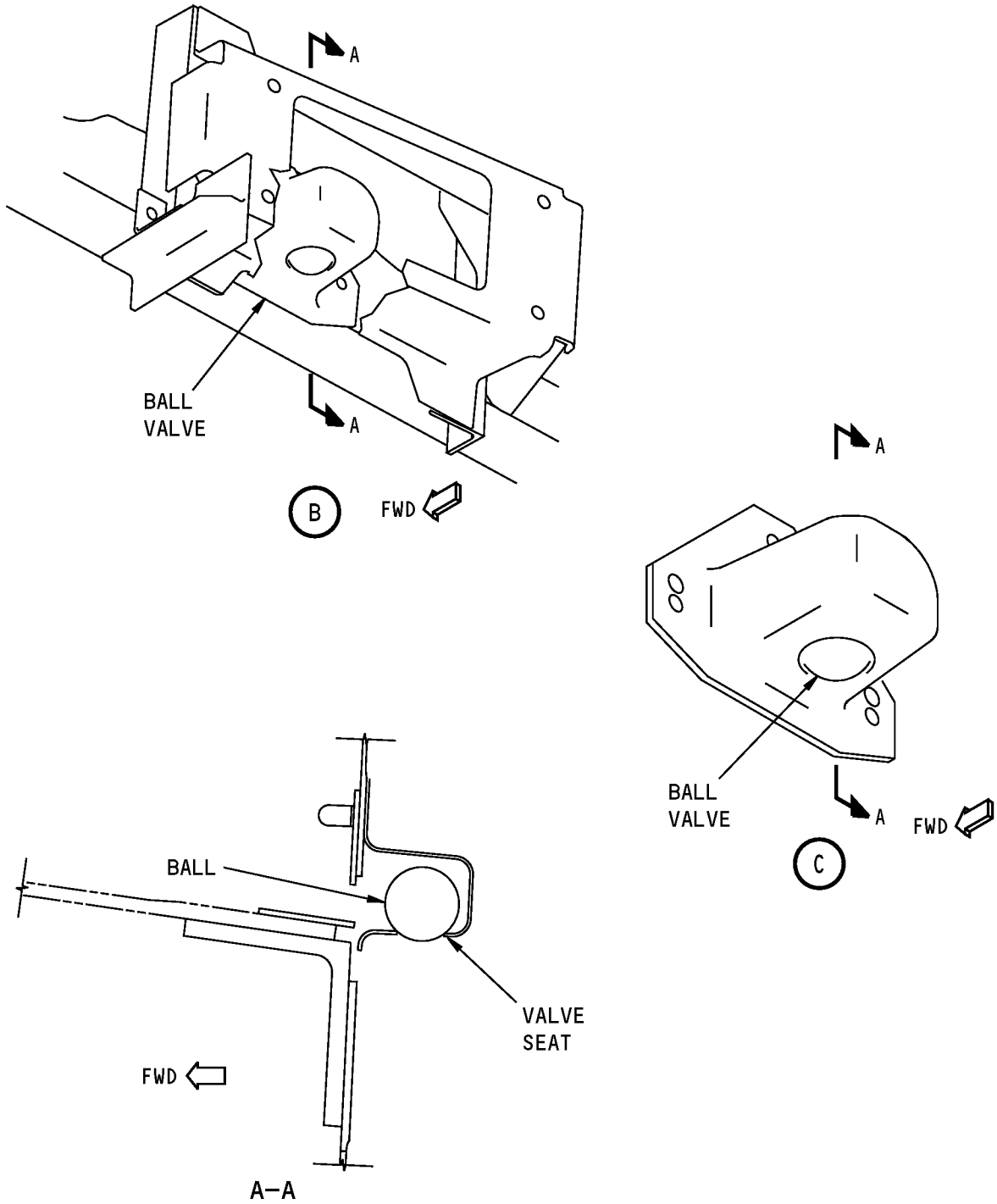
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Wing Center Section Rear Spar Ball Drain Valves
Figure 602 (Sheet 1 of 2)/51-41-11-990-802

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Wing Center Section Rear Spar Ball Drain Valves
Figure 602 (Sheet 2 of 2)/51-41-11-990-802

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EXTERNAL DRAINAGE - REPAIRS

1. General

A. This procedure contains one task. The task is to repair the compound used to level the area around the aircraft drains.

TASK 51-41-11-350-801

2. Repair the Compound Used to Level the Area Around the Aircraft Drains

A. References

Reference	Title
20-30-81-910-801	General Cleaning of All Organic Coatings (Series 81) (P/B 201)
51-21-95-300-801	Alodine Treatment Application (P/B 701)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved (Part #: 1-6390-A, Supplier: 63318, A/P Effectivity: 737-ALL) (Part #: 10810, Supplier: \$0855, A/P Effectivity: 737-ALL) (Part #: 234350, Supplier: \$0857, A/P Effectivity: 737-ALL) (Part #: 311, Supplier: KA861, A/P Effectivity: 737-ALL) (Part #: 411B60, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: 411B90, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: DAD5013, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: DFD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: J5-0275-2010, Supplier: 435R8, A/P Effectivity: 737-ALL) (Part #: SCD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: ST982LF, Supplier: 3Z323, A/P Effectivity: 737-ALL) (Part #: TS1275-4, Supplier: 1DWR5, A/P Effectivity: 737-ALL)

C. Consumable Materials

Reference	Description	Specification
A01026	Compound - Self-Leveling, Flexible, Fire-Retarded, For Fluid Drainage	BMS5-125, Type III
B01001	Solvent - General Cleaning Of All Organic Coatings (AMM 20-30-81/201) - Series 81	
C00064	Coating - Aluminum Chemical Conversion	BAC5719, Type II, Class A (MIL-C-5541, Class A)
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5
G50222	Brush - Stiff Bristle, Non-Metalic - Tampico GA55-1	

D. Procedure

SUBTASK 51-41-11-340-001

- (1) Use a sealant removal tool, COM-2481, or a rigid-bristle Tamico GA55-1 brush, G50222 to remove compound that is loose or damaged.

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SUBTASK 51-41-11-110-001

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (2) Use a cotton wiper, G00034 that is moist with Series 81 solvent, B01001 (TASK 20-30-81-910-801) to clean the structure and any compound that remains on the surface.

SUBTASK 51-41-11-370-001

- (3) For an aluminum surface that does not have a protective layer, do these steps.
 - (a) Apply a layer of coating, C00064, do this task: Alodine Treatment Application, TASK 51-21-95-300-801.
 - (b) Apply one layer of primer, C00259 primer to the surface of the aluminum.

SUBTASK 51-41-11-340-002

- (4) Mix the compound, A01026 .

SUBTASK 51-41-11-340-003

- (5) Pour the mixture around the drain.

SUBTASK 51-41-11-340-004

- (6) For airplanes without removable drain valves, the compound, A01026 must be level with the bottom of the drain hole. As an option, the compound, A01026 can be within 0.06 inch (1.52 mm) of spring drain valve contact area.

NOTE: Make sure the compound does not go into the drain valve. When you pour the compound, the airplane must be in a level position.

SUBTASK 51-41-11-340-005

- (7) For airplanes with removable drain valves, make sure the compound, A01026 is level with the bottom of the drain hole or the bottom of the drain valve.

NOTE: Make sure the compound does not go into the drain valve. When you pour the compound, the airplane must be in a level position. Do not move the airplane before the compound is hard (approx. 6 hours at 72 +/- 5 degrees F) (22.2 +/- 2.8 degrees C). The full cure time is 7 days.

————— **END OF TASK** —————

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INTERNAL DRAINAGE - INSPECTION/CHECK

1. General

A. This procedure contains one task:

(1) The task is to examine the internal drainage.

B. You must examine the internal drains with a regular schedule to make sure the drainage operates correctly, and to help prevent a fire or corrosion.

TASK 51-41-12-200-801

2. Examine Internal Drains

(Figure 601, Figure 602)

A. References

Reference	Title
53-21-00-000-801	Passenger Cabin Floor Panel Removal (P/B 401)

B. Consumable Materials

Reference	Description	Specification
B00402	Cleaner - Aerospace Equipment	MIL-PRF-87937
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

C. Location Zones

Zone	Area
100	Lower Half of Fuselage

D. Procedure

SUBTASK 51-41-12-010-001

(1) Remove the floor panels as it is necessary to get access to the upper surface of the wing center section, do this task: Passenger Cabin Floor Panel Removal, TASK 53-21-00-000-801.

SUBTASK 51-41-12-210-001

(2) Examine the drain openings through the aft lower corner of the ribs at the pressure deck beam.

SUBTASK 51-41-12-210-002

(3) Examine the internal drains frequently and make sure they are clear from the blockage.

SUBTASK 51-41-12-140-001

(4) To clean the internal drains, do the steps that follow:

(a) Use a cotton wiper, G00034 that is moist with cleaner, B00402 solution to remove all the soil and unwanted materials from the drains.

(b) Examine and clean the horizontal drain hole.

END OF TASK

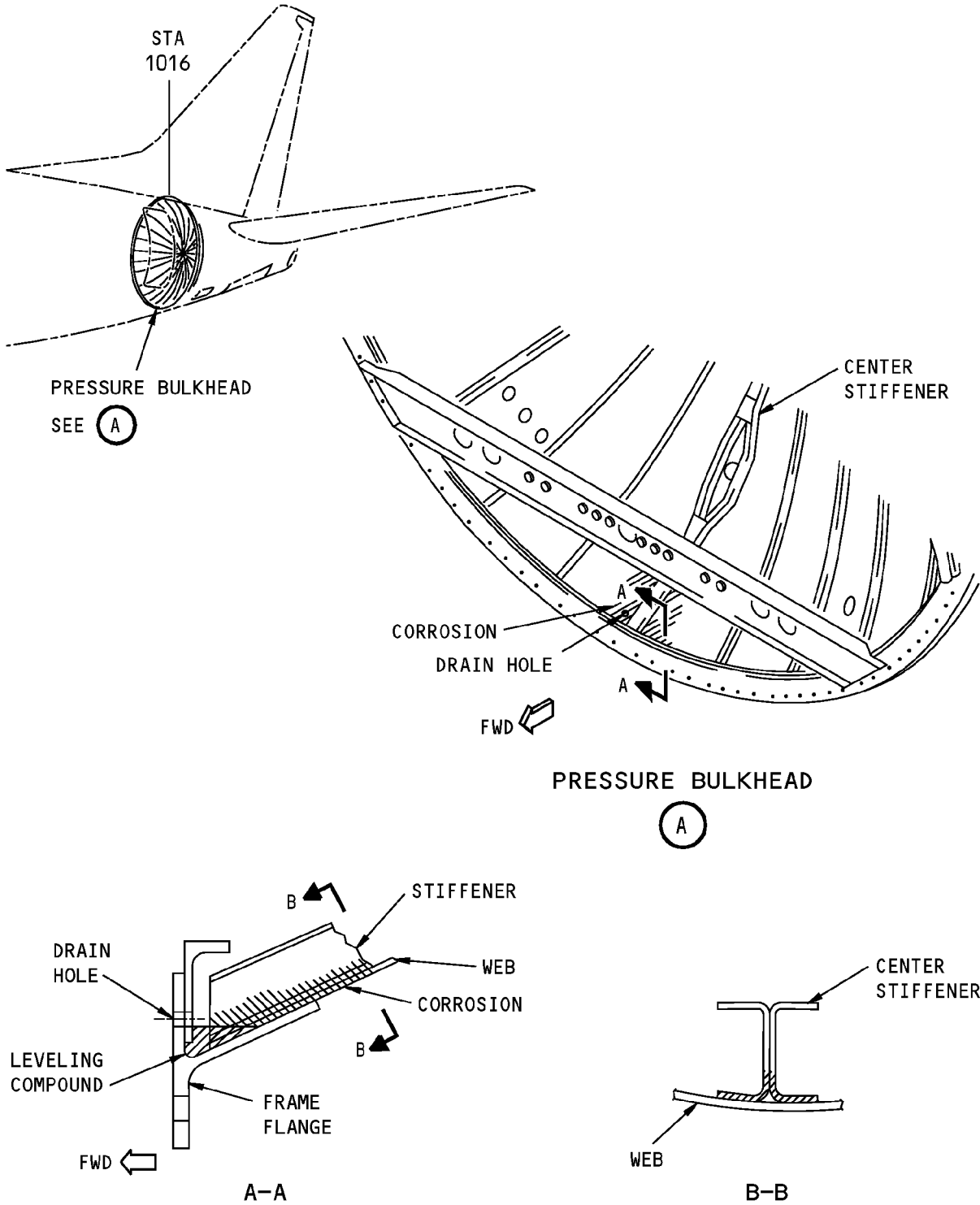
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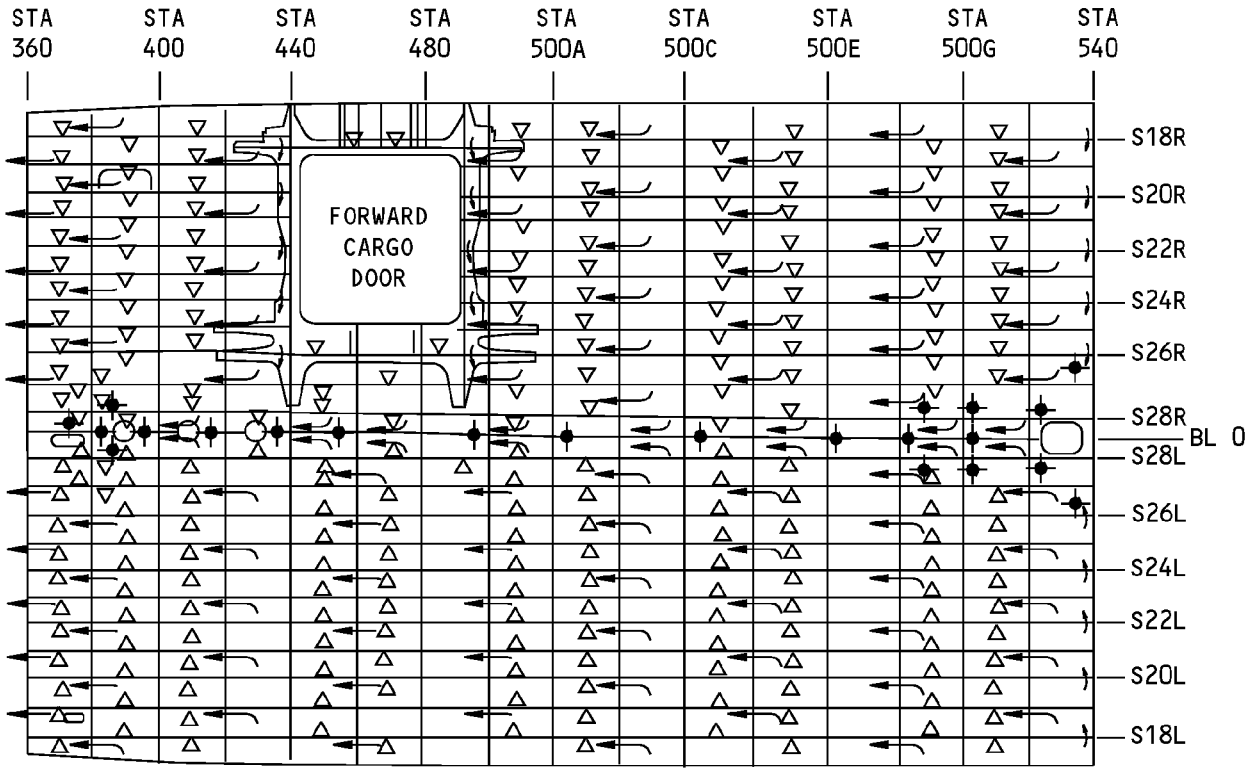
**Internal Drainage
Figure 601/51-41-12-990-801**

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SECTION 43

LEGEND

- Δ STRINGER AND FRAME DRAIN HOLE
LOCATION AND FLOW DIRECTION
- ◆ DRAIN VALVE
- ← FLOW DIRECTION

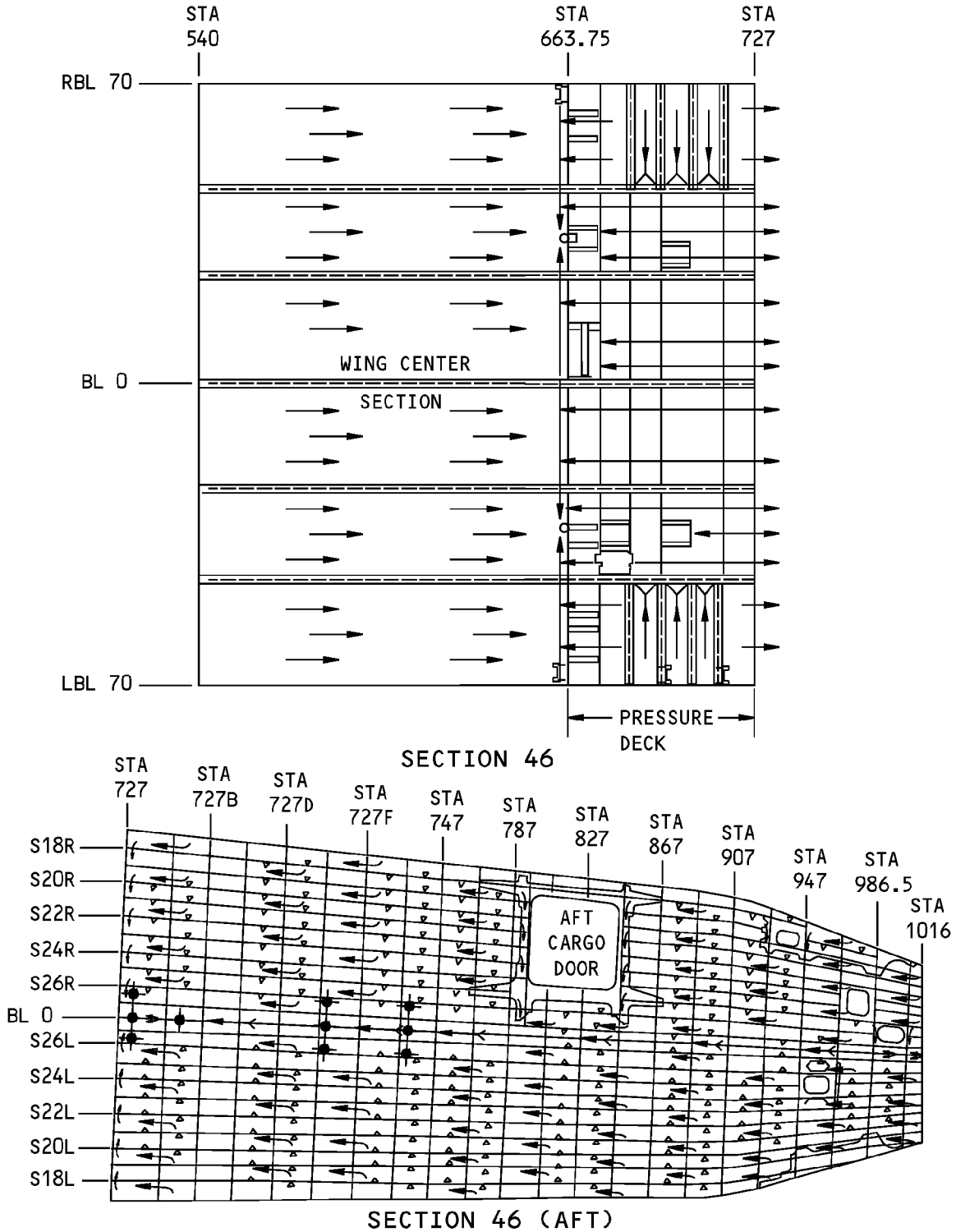
**Internal Drain Paths
Figure 602 (Sheet 1 of 2)/51-41-12-990-802**

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**Internal Drain Paths
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FUSELAGE DRAIN VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure contains two tasks. The first task is the removal procedure for the fuselage drain valve. The second task is the installation of the fuselage drain valve.
- B. You can get access to the fuselage drain valve from the outer surface of the fuselage.

TASK 51-41-13-020-801

2. Remove the Drain Valve

(Figure 401)

A. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1975	Adapter - Installation/Removal, Fuselage Drain Valve (Part #: 2024, Supplier: 57336, A/P Effectivity: 737-200, -200C, -300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

B. Remove the Drain Valve

SUBTASK 51-41-13-020-001

CAUTION: DO NOT USE A STEEL WRENCH. A STEEL WRENCH CAN CAUSE DAMAGE TO THE DRAIN VALVE.

- (1) Put the installation/removal fuselage drain valve adapter, SPL-1975 in the valve assembly.

SUBTASK 51-41-13-020-002

- (2) Turn the installation/removal fuselage drain valve adapter, SPL-1975 to remove the valve assembly from the retainer.

————— **END OF TASK** —————

TASK 51-41-13-420-801

3. Install the Drain Valve

(Figure 401)

A. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1975	Adapter - Installation/Removal, Fuselage Drain Valve (Part #: 2024, Supplier: 57336, A/P Effectivity: 737-200, -200C, -300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

B. Location Zones

Zone	Area
100	Lower Half of Fuselage

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C. Prepare for Installation

SUBTASK 51-41-13-100-001

- (1) Clean the drain valve in a water based cleaner solution.

SUBTASK 51-41-13-110-001

- (2) Make sure that the spring loaded plunger moves freely. If not, replace the valve assembly.

D. Install the Drain Valve

SUBTASK 51-41-13-420-001

- (1) Put the valve assembly into the fuselage hole.

SUBTASK 51-41-13-420-002

- (2) Engage the thread of the valve assembly in the retainer and tighten with the installation/removal fuselage drain valve adapter, SPL-1975.

————— **END OF TASK** —————

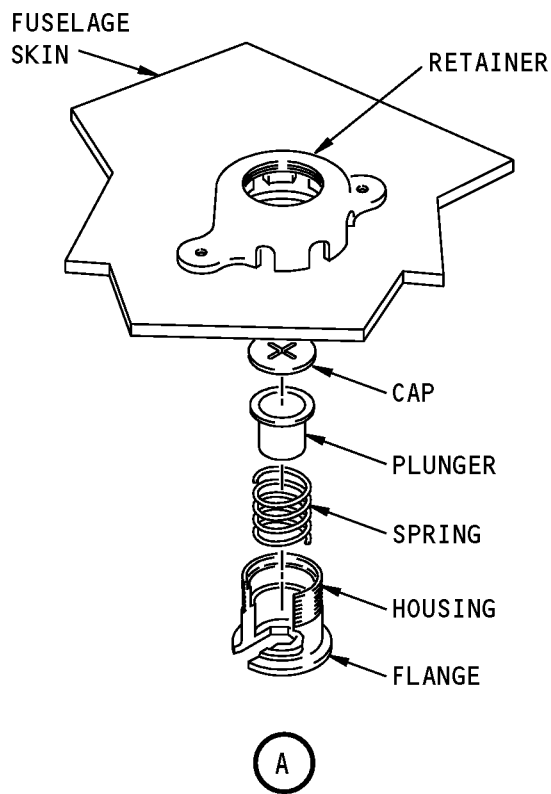
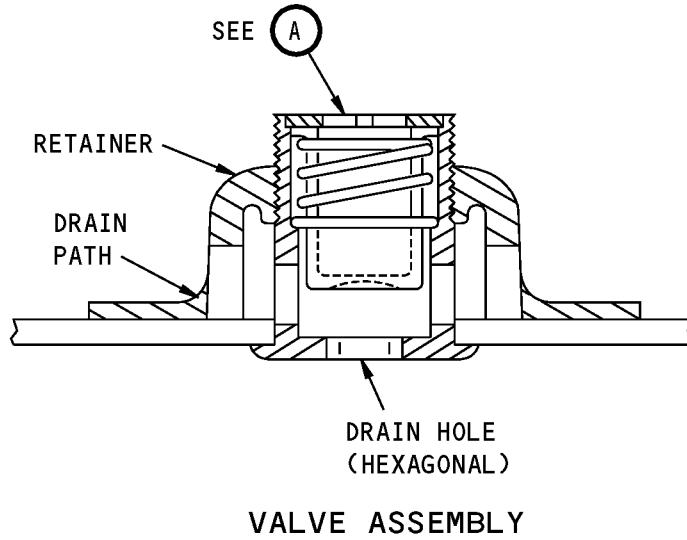
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**Drain Valve Installation
Figure 401/51-41-13-990-801**

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BONDED RUB PADS - MAINTENANCE PRACTICES

1. General

A. This procedure contains four tasks:

- (1) Bonded Phenolic or Stainless Steel Rub Pads (Heat source available)
- (2) Bonded Phenolic or Stainless Steel Rub Pads (No heat source available)
- (3) Bonded Phenolic or Stainless Steel Rub Pads (Field repair with a heat source)
- (4) Bonded Teflon Rub Pad Repair.

TASK 51-51-00-340-802

2. Bonded Phenolic or Stainless Steel Rub Pad Repair (Heat Source Available)

A. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-98-910-802	Cleaning of Phenolics or Nylon (Series 98-1) (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved (Part #: 1-6390-A, Supplier: 63318, A/P Effectivity: 737-ALL) (Part #: 10810, Supplier: \$0855, A/P Effectivity: 737-ALL) (Part #: 234350, Supplier: \$0857, A/P Effectivity: 737-ALL) (Part #: 311, Supplier: KA861, A/P Effectivity: 737-ALL) (Part #: 411B60, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: 411B90, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: DAD5013, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: DFD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: J5-0275-2010, Supplier: 435R8, A/P Effectivity: 737-ALL) (Part #: SCD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: ST982LF, Supplier: 3Z323, A/P Effectivity: 737-ALL) (Part #: TS1275-4, Supplier: 1DWR5, A/P Effectivity: 737-ALL)
STD-1086	Gloves - Rubber

C. Consumable Materials

Reference	Description	Specification
A00142	Sealant - Temperature Resistant, Fuel Pressure, And Weather Sealant	BMS5-44
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
A00767	Sealant - Fuel Tank	BMS5-45
B00083	Solvent - Aliphatic Naphtha (For Acrylic Plastics)	TT-N-95 Type II, ASTM D-3735 Type III
B00102	Abrasive - Aluminum Oxide Coated Cloth	ANSI B74.18
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding (AMM 20-30-88/201) - Series 88	

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Reference	Description	Specification
B01051	Solvent - Cleaning Of Phenolics Or Nylon (AMM 20-30-98/201) - Series 98-1	
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

D. Procedure

SUBTASK 51-51-00-100-002

(1) Do these steps to prepare the mating surfaces.

- (a) Make sure you put on clean cotton or rubber gloves, STD-1086 when you clean the mating surfaces.
- (b) To clean the phenolic rub pads, do these steps:
 - 1) Remove all loose dirt, grease, or oil from the surface with a clean cotton wiper, G00034.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- 2) Clean the surface with a cotton wiper, G00034 that is moist with Series 98-1 solvent, B01051 (TASK 20-30-98-910-802).
- 3) Immediately dry the surface with a clean dry cotton wiper, G00034.
- 4) Lightly rub the phenolic pad with abrasive cloth, B00102 paper until the gloss is removed.
 - a) Make sure the gloss is removed from all edges and corners of the pads.
- 5) Remove all remaining particles with a clean cotton wiper, G00034.

NOTE: Do not use solvent to remove the remaining particles.

- 6) Clean the surface with a clean cheesecloth.
 - a) Clean with a cotton wiper, G00034 that is moist with Series 98-1 solvent, B01051 (TASK 20-30-98-910-802) until all of the remaining particles are removed.
- 7) Clean the surface again if it is necessary.

(c) Do the steps that follow to clean the clad aluminum surfaces that do not have primer applied:

- 1) Remove all loose dirt, grease, or oil from the surface with a clean cotton wiper, G00034.
- 2) Clean the surface with a clean cotton wiper, G00034 that is moist with Series 88 solvent, B01008 (TASK 20-30-88-910-801)
- 3) Immediately dry the surface with a clean dry cotton wiper, G00034.
- 4) Lightly rub the clad surface with abrasive cloth, B00102 sheets until the mating surface is not shiny.
- 5) Remove the remaining particles with a clean cotton wiper, G00034.

NOTE: Do not use solvent to remove the remaining particles.

- 6) Clean the surface with a cotton wiper, G00034 that is moist with solvent, B00184 until all the remaining particles are removed.

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- 7) Immediately dry the surface with a clean cotton wiper, G00034.
- 8) Clean the surface again if it is necessary.
- (d) To clean the metal surfaces that have primer, C00259 primer applied, do the steps that follow:

NOTE: It is not necessary to clean the metal surfaces if the BMS 10-11 primer is new for less than 6 hours.

- 1) For surfaces with primer that is new for between 6 and 48 hours before it is cleaned, do the steps that follow:
 - a) Clean the surface with a cotton wiper, G00034 that is moist with solvent, B00083.
 - b) Immediately dry the surface with a clean cotton wiper, G00034.
- 2) For surfaces with primer that is new for more than 48 hours, do the steps that follow:
 - a) Clean the surface with a cotton wiper, G00034 that is moist with solvent, B00184.
 - b) Immediately dry the surface with a clean cotton wiper, G00034.
- 3) Clean the surface again if it is necessary.

SUBTASK 51-51-00-910-002

- (2) Do the steps that follow to apply the adhesive on the mating surfaces.
 - (a) The surfaces must be cleaned and dry for less than one hour before you apply the adhesive.
 - (b) Remove the rub pads with a sealant removal tool, COM-2481.
 - (c) Use heat lamps (250 Watts, commercially available) to make the adhesive soft.

NOTE: Do not apply heat at a temperature of 190°F (87.8°C) or more. Use a thermocouple to measure the temperature.

- (d) Remove the remaining adhesive from the surface with a sealant removal tool, COM-2481.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (e) Clean the area with a clean cotton wiper, G00034 that is moist with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
- (f) Immediately dry the area with a clean dry cotton wiper, G00034.
- (g) Mix the adhesive

NOTE: Keep the components that were not mixed in clean, airtight metal containers.

NOTE: Keep the mixed components at -20°F (-28.9°C) or lower.

- 1) Refer to the manufacturer's instructions to mix the base component and the activator.
- 2) Make sure the mixture is smooth and constant.
- 3) Keep air bubbles to a minimum when you mix the components.
- 4) Refer to (Table 801) for pot life for sealant, A00142 or sealant, A00247, Class B-2 mixed sealant by temperature.

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Table 801/51-51-00-993-811 Class B-2 Mixed Adhesive Pot Life

Temperature	Pot Life
70 Degrees F (21.1 Degrees C)	2 Hours
-30 to -20 Degrees F (-34.4 to -28.9 Degrees C)	7 Days
-40 to -30 Degrees F (-40 to -34.4 Degrees C)	10 Days
Below -40 Degrees F (-40 Degrees C)	14 Days

5) Refer to (Table 802) for pot life for sealant, A00767 or sealant, A00247, Class B-1/2 mixed sealant by temperature.

Table 802/51-51-00-993-812 Class B-1/2 Mixed Adhesive Pot Life

Temperature	Pot Life
70 Degrees F (21.1 Degrees C)	1/2 Hours
-30 to -20 Degrees F (-34.4 to -28.9 Degrees C)	7 Days
-40 to -30 Degrees F (-40 to -34.4 Degrees C)	10 Days
Below -40 Degrees F (-40 Degrees C)	14 Days

CAUTION: DO NOT APPLY ADHESIVE IF THE TEMPERATURE OF THE STRUCTURE IS BELOW 50°F (10°C). AT TEMPERATURES BELOW 50°F (10°C), THE PERFORMANCE OF THE ADHESIVE IS UNSATISFACTORY.

(h) Apply a thin layer of the adhesive (approximately 50 grams for each square foot, or .1 square meter) fully on each mating surface.

NOTE: Use a spreader that has serrations to apply the adhesive on a large mating surface.

(i) Make sure the adhesive has a sufficient thickness to let the adhesive flow around the edges of the rub pad.

NOTE: The adhesive will flow when the cure pressure is applied.

SUBTASK 51-51-00-340-002

(3) Do the steps that follow to apply the new pad:

(a) Do the steps that follow to assemble the parts:

NOTE: Assemble the part in less than 20 minutes after you mix the B-1/2 material.

NOTE: Assemble the part in less than 2 hours after you mix the B-2 material.

1) Put the rub pads in position.

2) Use a clean roller or rub the surface of the rub pad with a clean cotton wiper, G00034 to remove the air caught between the surfaces.

NOTE: Too much pressure can push too much adhesive out from the rub pads.

3) Remove the unwanted adhesive with a clean cotton wiper, G00034 that is moist with Series 98-1 solvent, B01051 (TASK 20-30-98-910-802).

NOTE: Do not let the solvent go into bond line.

4) Let the adhesive dry for 10 minutes before you apply the cure pressure.

5) Apply the cure pressure equally to the assembled part for the times that follow:

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- a) in less than 3.0 hours after you mix the B-2 material.
- b) in less than 1.0 hour after you mix the B-1/2 material.
- 6) Cure the phenolic pads that are bonded to aluminum at constant pressure of 5 to 14 pounds per square inch (psi) (34-96 kPa). Refer to (Table 803):

Table 803/51-51-00-993-813 Curing Specifications

Curing Temperature degrees F (degrees C)	Hours After You Apply the Cure Pressure	
	Adhesive Class B-1/2	Adhesive Class B-2
77 +/-5 (25 +/-2.8)	45	72
72 +/-5 (22.2 +/-2.8)	68	108
67 +/-5 (19.4 +/-2.8)	90	144
62 +/-5 (16.7 +/-2.8)	135	216
115 +/-5 (46.1 +/-2.8) ^{*[2]}	12 ^{*[2]}	18 ^{*[2]}
185 +/-5 (85 +/-2.8) ^{*[1]}	0.75 ^{*[1]}	0.75 ^{*[1]}
Bond Line Temperature Below Cure Pressure		

*[1] More time on the cure pressure is necessary to heat the adhesive from 70 to 180 degrees F (21.1-82.2 degrees C).

*[2] Optional cure pressure and time. You can use the optional cure temperature and time only with Pro Seal 890.

- (b) Remove the unwanted adhesive with a sealant removal tool, COM-2481.
- (c) Remove the remaining adhesive from the surface with a clean cotton wiper, G00034 that is moist with Series 98-1 solvent, B01051 (TASK 20-30-98-910-802).

END OF TASK

TASK 51-51-00-340-803

3. Bonded Phenolic or Stainless Steel Rub Pad Repair (No Heat Source Available)

(Table 805, Table 804)

A. References

Reference	Title
20-30-98-910-802	Cleaning of Phenolics or Nylon (Series 98-1) (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved (Part #: 1-6390-A, Supplier: 63318, A/P Effectivity: 737-ALL) (Part #: 10810, Supplier: \$0855, A/P Effectivity: 737-ALL) (Part #: 234350, Supplier: \$0857, A/P Effectivity: 737-ALL) (Part #: 311, Supplier: KA861, A/P Effectivity: 737-ALL) (Part #: 411B60, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: 411B90, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: DAD5013, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: DFD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: J5-0275-2010, Supplier: 435R8, A/P Effectivity: 737-ALL) (Part #: SCD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: ST982LF, Supplier: 3Z323, A/P Effectivity: 737-ALL) (Part #: TS1275-4, Supplier: 1DWR5, A/P Effectivity: 737-ALL)

C. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
B01051	Solvent - Cleaning Of Phenolics Or Nylon (AMM 20-30-98/201) - Series 98-1	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

D. Procedure

NOTE: This procedure is recommended for a field repair of the bonded rub strips when a short cure time is necessary.

SUBTASK 51-51-00-910-003

- (1) Do the steps that follow to apply the adhesive on the mating surfaces.
 - (a) The surfaces must be cleaned and dry for less than one hour before you apply the adhesive.
 - (b) Remove the rub pads with a sealant removal tool, COM-2481.
 - (c) Use heat lamps (250 Watts, commercially available) to make the adhesive soft.
 - NOTE:** Do not apply heat at a temperature of 190°F (87.8°C) or more. Use a thermocouple to measure the temperature.
 - (d) Remove the remaining adhesive from the surface with a sealant removal tool, COM-2481.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (e) Clean the area with a clean cotton wiper, G00034 that is moist with Series 98-1 solvent, B01051 (TASK 20-30-98-910-802).
- (f) Immediately dry the area with a clean dry cotton wiper, G00034.
- (g) Mix the adhesive

NOTE: Keep the components that were not mixed in clean, airtight metal containers.

NOTE: Keep the mixed components at -20°F (-28.9°C) or lower.

- 1) Refer to the manufacturer's instructions to mix the base component and the activator.
- 2) Make sure the mixture is smooth and constant.
- 3) Keep air bubbles to a minimum when you mix the components.

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- 4) Refer to (Table 804) for pot life for sealant, A00767 Class B-2 mixed adhesive by temperature.

Table 804/51-51-00-993-804 CLASS B-2 MIXED ADHESIVE POT LIFE

Temperature	Pot life
70 Degrees F (21.1 Degrees C)	2 hours
-20 to -30 Degrees F (-28.9 to -34.4 Deg. C)	7 days
-30 to -40 Degrees F (-34.4 to -40 Deg. C)	10 days
Below -40 Degrees F (Below -40 Degrees C)	14 days

- 5) Refer to (Table 805) for pot life for sealant, A00767 Class B-1/2 mixed adhesive by temperature.

Table 805/51-51-00-993-805 CLASS B-1/2 MIXED ADHESIVE POT LIFE

Temperature	Pot life
70 Degrees F (21.1 Degrees C)	1/2 hours
-20 to -30 Degrees F (-28.9 to -34.4 Deg. C)	7 days
-30 to -40 Degrees F (-34.4 to -40 Deg. C)	10 days
Below -40 Degrees F (Below -40 Degrees C)	14 days

CAUTION: DO NOT APPLY ADHESIVE IF THE TEMPERATURE OF THE STRUCTURE IS BELOW 50°F (10°C). AT TEMPERATURES BELOW 50°F (10°C), THE PERFORMANCE OF THE ADHESIVE IS UNSATISFACTORY.

- (h) Apply a thin continuous layer of the adhesive (approximately 50 grams for each square foot, or 0.1 square meter) fully on each mating surface.

NOTE: Use a spreader that has serrations to apply the adhesive on a large mating surface.

- (i) Make sure the adhesive has a sufficient thickness to let the adhesive flow around the edges of the rub pad.

NOTE: The adhesive will flow when the cure pressure is applied.

SUBTASK 51-51-00-340-003

- (2) Do the steps that follow to apply a new pad:
 - (a) Do the steps that follow to install the new rub strip on the assembly:
 - 1) Make sure the mating surfaces are clean.
 - 2) Apply a thin layer of the adhesive (approximately 50 grams for each square foot, or 0.1 square meter) fully on each mating surface.
 - a) Assemble the parts in less than 25 minutes after you mix the adhesive.

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3) Put the rub strip flat against the assembly surface.

NOTE: Do not hold or use a clamp on the rub strip.

NOTE: If the clearance between the mating surfaces of the rub strip and the assembly is greater than 0.125 inch (3.2 mm), apply a light pressure with a clean roller to get a smaller clearance.

(b) Keep the minimum cure time at 6 hours and the temperature at 64°F (17.8°C).

(c) To apply the cure pressure, do these steps:

1) Apply a smooth constant pressure to the rub strip each 15 minutes.

NOTE: Do this step during the first 3 hours after the parts are assembled.

2) Make sure you have a continuous bead of adhesive at the bond line to get a satisfactory bond between the mating surfaces.

3) You can apply more pressure to remove air pockets in the bond line during the first 3 hours after the parts are assembled.

END OF TASK

TASK 51-51-00-340-804

4. Bonded Phenolic or Stainless Steel Rub Pad (Field repair with a heat source)

(Table 807, Table 806)

A. References

Table with 2 columns: Reference, Title. Row: 20-30-98-910-802, Cleaning of Phenolics or Nylon (Series 98-1) (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Table with 2 columns: Reference, Description. Row: COM-2481, Tool - Sealant Removal, BAC5000, PSD 6-184 Approved (Part #: 1-6390-A, Supplier: 63318, A/P Effectivity: 737-ALL) ... (Part #: TS1275-4, Supplier: 1DWR5, A/P Effectivity: 737-ALL)

C. Consumable Materials

Table with 3 columns: Reference, Description, Specification. Rows: A00767, Sealant - Fuel Tank, BMS5-45; B01051, Solvent - Cleaning Of Phenolics Or Nylon (AMM 20-30-98/201) - Series 98-1; G00034, Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze), BMS15-5

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D. Procedure

SUBTASK 51-51-00-910-004

- (1) Do the steps that follow to apply the adhesive on the mating surfaces.
 - (a) The surfaces must be cleaned and dry for less than one hour before you apply the adhesive.
 - (b) Remove the rub pads with a sealant removal tool, COM-2481.
 - (c) Use heat lamps (250 Watts, commercially available) to make the adhesive soft.

NOTE: Do not apply heat at a temperature of 190°F (87.8°C) or more. Use a thermocouple to measure the temperature.
 - (d) Remove the remaining adhesive from the surface with a sealant removal tool, COM-2481.

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (e) Clean the area with a clean cotton wiper, G00034 that is moist with Series 98-1 solvent, B01051 (TASK 20-30-98-910-802).
- (f) Immediately dry the area with a clean dry cotton wiper, G00034.
- (g) Mix the adhesive.

NOTE: Keep the components that were not mixed in clean, airtight metal containers.

NOTE: Keep the mixed components at -20°F (-28.9°C) or lower.

- 1) Refer to the manufacturer's instructions to mix the base component and the activator.
- 2) Make sure the mixture is smooth and constant.
- 3) Keep air bubbles to a minimum when you mix the components.
- 4) Refer to (Table 806) for pot life for sealant, A00767 Class B-2 mixed adhesive by temperature.

Table 806/51-51-00-993-806 CLASS B-2 MIXED ADHESIVE POT LIFE

Temperature	Pot life
70 Degrees F (21.1 Degrees C)	2 hours
-20 to -30 Degrees F (-28.9 to -34.4 Deg. C)	7 days
-30 to -40 Degrees F (-34.4 to -40 Deg. C)	10 days
Below -40 Degrees F (Below -40 Degrees C)	14 days

- 5) Refer to (Table 807) for pot life for sealant, A00767 Class B-1/2 mixed adhesive by temperature.

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Table 807/51-51-00-993-807 CLASS B-1/2 MIXED ADHESIVE POT LIFE

Temperature	Pot life
70 Degrees F (21.1 Degrees C)	1/2 hours
-20 to -30 Degrees F (-28.9 to -34.4 Deg. C)	7 days
-30 to -40 Degrees F (-34.4 to -40 Deg. C)	10 days
Below -40 Degrees F (Below -40 Degrees C)	14 days

CAUTION: DO NOT APPLY ADHESIVE IF THE TEMPERATURE OF THE STRUCTURE IS BELOW 50°F (10°C). AT TEMPERATURES BELOW 50°F (10°C), THE PERFORMANCE OF THE ADHESIVE IS UNSATISFACTORY.

- (h) Apply a thin layer of the adhesive (approximately 50 grams for each square foot, or 0.1 square meter) fully on each mating surface.

NOTE: Use a spreader that has serrations to apply the adhesive on a large mating surface.

- (i) Make sure the adhesive has a sufficient thickness to let the adhesive flow around the edges of the rub pad.

NOTE: The adhesive will flow when the cure pressure is applied.

SUBTASK 51-51-00-340-004

- (2) Do the steps that follow to apply a new pad:

- (a) Do the steps that follow to install the new rub pad on the assembly:

- 1) Make sure the mating surfaces are clean.
- 2) Apply a thin layer of adhesive (approximately 50 grams on each square foot, or 0.1 square meter) fully on each mating surface.
 - a) Assemble the parts in less than 25 minutes after you mix and apply the adhesive.
- 3) Put the rub strip flat against the assembly surface.

NOTE: Do not hold or use a clamp on the rub strip.

NOTE: If the clearance between the mating surfaces of the rub strip and the assembly is greater than 0.125 inch (3.2 mm), apply a light pressure with a clean roller to get a smaller clearance.

- (b) To cure the assembly, do these steps:

- 1) Use two heat lamps, 250 watts each, as a heat source.
 - a) Put the lamps 9 inches (22.9 cm) apart and 6 inches (15.2 cm) from the rub strip.

NOTE: Make sure the heat lamps point down on the rub strip.

- 2) Apply heat on the assembly at a temperature of 90 (±5)°F (32.2 ± 2.8°C).

NOTE: Permit at least 1 1/2 hours from the time you mix the adhesive to the time you cure the adhesive.

- 3) Cure the assembly for 2 hours minimum at 85 to 120°F (29.4-48.9°C).

NOTE: Use a thermocouple to measure the temperature.

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- 4) Let the assembly stay for at least 20 minutes before you apply the cure pressure.
- (c) To apply the cure pressure, do these steps:
 - 1) Apply a smooth constant pressure to the rub strip every 15 minutes during the first 2 hours after the parts are assembled.
 - 2) Make sure a continuous bead of adhesive is at the bond line to get a satisfactory bond between the mating surfaces.
 - 3) Apply more pressure to remove air pockets in the bond line as the adhesive cures in the assembly.

————— END OF TASK —————

TASK 51-51-00-340-805

5. Bonded Teflon Rub Pad Repair

(Table 809, Table 808, Table 810)

A. General

WARNING: DO NOT GET TEFLON ETCHING MATERIAL IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES OR MIST FROM TEFLON ETCHING MATERIAL. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE TEFLON ETCHING MATERIAL. DO NOT LET TEFLON ETCHING MATERIAL CONTACT YOUR SKIN, EYES, OR YOUR CLOTHES. TEFLON ETCHING MATERIAL IS CORROSIVE, TOXIC, FLAMMABLE, AND EXPLOSIVE. TEFLON ETCHING MATERIAL CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) You must do the safety procedures that follow during this task.
 - (a) Do not breath the fumes or mist from teflon etching material.
 - 1) You must etch the teflon rubstrips in a ventilated area.
 - 2) If it is possible, etch the teflon rubstrips under a ventilation hood.
 - (b) Keep all flammable material away from a source of ignition.
 - (c) Make sure you use anhydrous ammonia because anhydrous ammonia does not contain water.

B. References

Reference	Title
20-30-98-910-801	Cleaning of Specific Polymeric (Series 98) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
A00767	Sealant - Fuel Tank	BMS5-45
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
B00342	Alcohol - N-Butyl (Butanol)	ASTM D304
B01018	Solvent - Cleaning Of Specific Polymeric (AMM 20-30-98/201) - Series 98	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

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(Continued)

Reference	Description	Specification
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)

D. Prepare the mating surfaces.

SUBTASK 51-51-00-110-001

(1) Do the steps that follow to prepare the mating surface:

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

- (a) Use a cloth that is moist with Series 98 solvent, B01018 (TASK 20-30-98-910-801) to clean the mating surface.
- (b) Use a cloth that is moist with solvent, B00062 to clean the mating surface of the teflon pad.
- (c) Apply masking Scotch Flatback Masking Tape 250, G00270 to the opposite side of the teflon pad mating surface.

E. Etch the teflon pad mating surface as follows

NOTE: You can get teflon rub pads that are etched. This paragraph applies only to teflon pads that are not etched.

SUBTASK 51-51-00-110-002

WARNING: DO NOT GET TEFLON ETCHING MATERIAL IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES OR MIST FROM TEFLON ETCHING MATERIAL. PUT ON PROTECTIVE SPLASH GOGGLES AND GLOVES WHEN YOU USE TEFLON ETCHING MATERIAL. DO NOT LET TEFLON ETCHING MATERIAL CONTACT YOUR SKIN, EYES, OR YOUR CLOTHES. TEFLON ETCHING MATERIAL IS CORROSIVE, TOXIC, FLAMMABLE, AND EXPLOSIVE. TEFLON ETCHING MATERIAL CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do the Etching Method I (FluoroBond or Tetra-Etch) that follows:

- (a) Put the part in the etchant solution for a minimum of 30 seconds and a maximum of 60 seconds.
- (b) The part must have a dark brown color in 60 seconds.

NOTE: If the part is not dark brown in 60 seconds, the etchant solution must be replaced with new etchant solution.

- (c) Immediately clean the part when the etching is completed.
 - 1) Use a 3 to 5 percent solution (by volume) of water in butyl alcohol, B00342 to remove all of the etchant from the part.
- (d) Wash the part in clean water.
- (e) Remove the Scotch Flatback Masking Tape 250, G00270.
- (f) Clean the surface that had the Scotch Flatback Masking Tape 250, G00270 with a clean cotton wiper, G00034 that is wet with solvent, B00062.

SUBTASK 51-51-00-340-005

(2) Do the steps that follow to repair the teflon rub pads:

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(a) Mix the adhesive.

NOTE: Keep the components that were not mixed in clean, airtight metal containers.

NOTE: Keep the mixed components at -20°F (-28.9°C) or lower.

- 1) Refer to the manufacturer's instructions to mix the base component and the activator.
- 2) Make sure the mixture is smooth and constant.
- 3) Keep air bubbles to a minimum when you mix the components.
- 4) Do not make the adhesive too thin.
- 5) Refer to (Table 808) for pot life for sealant, A00767, sealant, A00247 Class B-2 mixed adhesive by temperature.

Table 808/51-51-00-993-808 CLASS B-2 MIXED ADHESIVE POT LIFE

Temperature	Pot life
70 Degrees F (21.1 Degrees C)	2 hours
-20 to -30 Degrees F (-28.9 to -34.4 Deg. C)	7 days
-30 to -40 Degrees F (-34.4 to -40 Deg. C)	10 days
Below -40 Degrees F (Below -40 Degrees C)	14 days

6) Refer to (Table 809) for pot life for sealant, A00767, sealant, A00247 Class B-1/2 mixed sealant by temperature.

NOTE: Make sure you keep the mixture in sealant gun tubes or in aluminum toothpaste type tubes.

NOTE: Make a mark on each container with the material name and the expiration date.

Table 809/51-51-00-993-809 CLASS B-1/2 MIXED ADHESIVE POT LIFE

Temperature	Pot life
70 Degrees F (21.1 Degrees C)	1/2 hours
-20 to -30 Degrees F (-28.9 to -34.4 Deg. C)	7 days
-30 to -40 Degrees F (-34.4 to -40 Deg. C)	10 days
Below -40 Degrees F (Below -40 Degrees C)	14 days

(b) Do the steps that follow to apply a new pad:

(c) To install the new rub strip on the assembly, do these steps:

- 1) Make sure the mating surfaces are clean.
- 2) Apply a thin layer of adhesive (approximately 50 grams on each square foot, or 0.1 square meter) fully on each mating surface.

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- a) Assemble the parts in less than 25 minutes after you mix the adhesive.
- 3) Put the rub strip flat against the assembly surface.

NOTE: Do not hold or use a clamp on the rub strip.

NOTE: If the clearance between the mating surfaces of the rub strip and the assembly is greater than 0.125 inch (3.2 mm), apply a light pressure with a clean roller to get a smaller clearance.

- (d) Do the steps that follow to cure the assembly:

- 1) Use two heat lamps, 250 watts each, as a heat source.

NOTE: Put the lamps 9 inches (23 mm) apart and 6 inches (15 mm) from the rub strip. Make sure the heat lamps point down on the rub strip.

- 2) Apply heat on the assembly at a temperature of 90 (±5)°F (32.2 ± 2.8°C).

NOTE: Permit at least 1 1/2 hours from the time you mix the adhesive to the time you cure the adhesive.

- 3) Cure the assembly for 2 hours minimum at 85 to 120°F (29.4-48.9°C).

NOTE: Use a thermocouple to measure the temperature.

- 4) Let the assembly stay for at least 20 minutes before you apply the cure pressure.

- 5) Apply the cure pressure:

- a) Apply a smooth constant pressure to the rub strip every 15 minutes during the first 2 hours after the parts are assembled.
- b) Make sure a continuous bead of adhesive is at the bond line to get a satisfactory bond between the mating surfaces.
- c) Apply more pressure to remove air pockets in the bond line as the adhesive cures in the assembly.

- 6) Cure the pad at 75 to 80°F (23.9-26.7°C). Refer to (Table 810) for cure times to handling strength.

NOTE: The time to a full cure is one week or more.

Table 810/51-51-00-993-810 CURE TIMES TO HANDLING STRENGTH

Adhesive	Handling time
BMS 5-45, Class B-2	48 hours
BMS 5-95, Class B-1/2	24 hours
Class B-2	48 hours

- 7) You can make a test of the cure strength with a Durometer. Before you touch the rub pad, the Rex Model A Durometer must read 30 and the Shore A Durometer must read 20.

————— END OF TASK —————

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