DE HAVILLAND AIRCRAFT OF CANADA LIMITED

PPS 34.11

PRODUCTION PROCESS STANDARD

PROPRIETARY INFORMATION

PRIMING AND PAINTING OF DASH 8 AIRCRAFT EXTERIOR SURFACES

Issue 23
- This standard supersedes PPS 34.11, Issue 22.
- Vertical lines in the left hand margin indicate technical changes over the previous issue.
- Direct PPS related questions to christie.chung@dehavilland.com or (416) 375-7641.
- This PPS is effective as of the distribution date.

- **THIS STANDARD SPECIFIES MANUFACTURING PROCESSES WHICH ARE CRITICAL TO THE LIGHTNING PROTECTION AND TRANSPORT CANADA CERTIFICATION OF DASH 8 AIRCRAFT.**
- **IT IS IMPERATIVE THAT THE PROCEDURE SPECIFIED HEREIN BE STRICTLY ADHERED TO.**
- **THE CURRENT ISSUE OF THIS PPS AND ANY SUBSEQUENT REVISIONS TO THE PROCEDURE AND REQUIREMENTS SPECIFIED HEREIN MUST BE AUTHORIZED BY AN UNDERSIGNED TRANSPORT CANADA DESIGN APPROVAL DESIGNEE (DAD).**

(P. Bootsma, DAD 212) March 8, 2021

Lightning/EMI/HIRF

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M&P Engineering

Signed original on file. Validation of paper prints is the responsibility of the user.

Issue 23 - Summary of Changes (over the previous issue)

The following summaries are not detailed and are intended only to assist in alerting PPS users to changes which may affect them. Refer to the applicable sections of this PPS for detailed procedure and requirements.

- Replaced throughout PPS where “Bombardier” is specified with “De Havilland Aircraft of Canada Limited” or “DHC”.
- Specified use of the following Bombardier Aerospace documents at the specified frozen revisions: BAERD GEN-007, Rev. C; BAERD GEN-023, Rev. A; and BAPS 138-055, Rev. D.
- Revised Facilities Requirements section.
- Defined MRB.
- Allowed use of 120 grit size abrasive paper for intermediate surface preparation of metallic parts.
- Specified a range of ±5°F (±3°C) for temperature and ±10% relative humidity range for high solids F24 drying times before taping and overcoating.
- Added new Disposal of Chemical Wastes section.
- Specified to always use the oldest stock first (i.e., first in/first out (FIFO) basis).

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1 SCOPE

1.1 This Production Process Standard (PPS) specifies the procedure and requirements for priming and painting of major components and complete DASH 8 series 100, 200, 300 and 400 aircraft with the applicable exterior paint system.

1.1.1 This PPS complements the engineering drawings that specify its use as an authorized instruction. The procedure specified in this PPS must be followed to ensure compliance with all applicable specifications. In general, if this PPS conflicts with the engineering drawing, follow the engineering drawing. The requirements specified in this PPS are necessary to fulfil the engineering design and reliability objectives.

1.1.2 Refer to PPS 13.26 for the subcontractor provisions applicable to this PPS.

2 HAZARDOUS MATERIALS

2.1 Before receipt at De Havilland Aircraft of Canada Limited (DHC), all materials must be approved and assigned Material Safety Data Sheet (MSDS) numbers by the DHC Environment, Health and Safety Department. Refer to the manufacturer's MSDS for specific safety data on any of the materials specified in this PPS. If the MSDS is not available, contact DHC Environment, Health and Safety Department.

3 REFERENCES

3.1 BAERD GEN-007, Rev. C - Quality Control of Heat Treating Equipment and Hot Forming Equipment.

3.2 BAERD GEN-023, Rev. A - Contamination Control for Compressed Air.

3.3 BAPS 138-055, Rev. D - Accelerated Curing of Organic Compounds.

3.4 EHS-OP-005 - Hazardous Materials Management, *DHC internal operating procedure*.

3.5 PPS 10.01 - Handling, Care and Finishing of Transparent Plastic Parts.

3.6 PPS 13.13 - Personal Protective Respiratory Equipment.

3.7 PPS 13.26 - General Subcontractor Provisions.

3.8 PPS 13.28 - Storage Life of Adhesives, Sealants, Paints and Composite Products.

3.9 PPS 13.39 - DASH 8 & Lear 45 Critical and Special Processes PPS Index.

3.10 PPS 15.04 - Use of Markers for Marking Aircraft Parts and Assemblies.

3.11 PPS 16.05 - Application of Non-Skid Coatings.

3.12 PPS 21.06 - Sealing DASH 8 Exterior Paint Edges.

3.13 PPS 21.19 - Sealing Removable Parts.

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3.15 PPS 31.02 - Cleaning Processes for Aluminum and Aluminum Alloys.

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3.20 PPS 34.03 - Application of Polyurethane Enamel.

3.21 PPS 34.08 - Application of Epoxy-Polyamide Primer (F19 & F45).

3.22 PPS 34.15 - Application of Anti-Static Polyurethane Enamel (F31 & F34).

3.23 PPS 34.16 - Application of Urethane Compatible Primer (F23).

3.24 PPS 34.18 - Application of Polyurethane Anti-Static Erosion Resistant Coatings (F36 & F40).

3.25 PPS 34.19 - Application of F41 Anti-Static Coating.

3.26 PPS 34.23 - Application of DSC 595 Adhesion Promoter.

3.27 PPS 34.25 - Application of DHMS C4.30 Primer/Base Coat/Clear Coat Paint System (F47).

4 MATERIALS, EQUIPMENT AND FACILITIES

4.1 Materials

4.1.1 F19 primer, epoxy-polyamide, to DHMS C4.01 Type 2 (green) and Type 3 (white).

4.1.2 F23 primer, epoxy, urethane compatible, corrosion resistant, to DHMS C4.18 Type III.

4.1.3 F24 enamel, polyurethane, to DHMS C4.04 Type 4 or Type 6.

4.1.4 F31 enamel, carbon-filled, anti-static, flat, to DHMS C4.13 Type I.

4.1.5 F34 enamel, carbon-filled, anti-static, flat, to DHMS C4.13 Type II.

4.1.6 Alcoa aluminum paste, No. 1593 or No. 726, conforming to ASTM D962 Type 4, Class A.

4.1.7 F36 & F40 coating, polyurethane, erosion resistant, anti-static, to MIL-C-83231 Type I, Class A and Type II, Class A, respectively.

4.1.8 Masking tape, 1" wide (e.g., 3M Scotch No. 250, Tuck No. 160).

4.1.9 F41 anti-static epoxy coating:

- PPG Aerospace PRC-DeSoto Inc. 528X310 (Base) / 910X464 (Hardener) to BMS 10-21, Type III.
- Akzo Nobel Aerospace Coatings 10-P2-3 (Base) / EC-110 (Activator) to BMS 10-21, Type III.

4.1.10 Aluminum foil tape (e.g., 3M Scotch No. 425).

4.1.11 Aluminum test panels to LAB 062-1C2A.

4.1.12 Turco Jet Clean E, Deane & Company.

4.1.13 Alumiprep #33, Henkel Co.

4.1.14 Awl-Quik sanding primer, U.S. Paint Corp., D8003 (base) / D9001 (catalyst).

4.2 Equipment

4.2.1 Compressed air for use with spray guns. Compressed air used with spray application equipment must meet the requirements of BAERD GEN-023, Rev. A.

4.2.2 Abrasive pads (e.g., 3M Canada Ltd. Type A Fine (maroon colour) Scotch-Brite).

4.2.3 Sealant scraper, plastic (e.g., DHC SD9265).

4.2.4 Dry adhesion test tape, 3M Shuretape #250, 1" X 3" long.

4.2.5 Wiping cloths (e.g., DSC 378-2).

4.2.6 Tack rags (e.g., DSC 375-1).

4.2.7 Aluminum oxide abrasive paper - 180, 220, 320 and 400 grit.

4.2.8 Aluminum oxide abrasive paper - 120 grit.

4.2.9 Dry film thickness gauge (e.g., Elcometer Model 256 FN).

4.2.10 Spray guns and associated equipment (e.g., HVLP, air electrostatic, high pressure air assist, etc.) capable of applying coatings to the dry film thicknesses specified herein without unacceptable defects as specified in section 6. Operate spray guns and associated equipment according to the equipment manufacturer's instructions.

4.2.11 Accelerated cure oven or area (conventional or infrared (IR)) qualified according to BAPS 138-055, Rev. D (including temperature uniformity survey according to BAERD GEN-007), Rev. C.

4.3 Facilities

4.3.1 This PPS has been categorized as a Controlled Special Process according to PPS 13.39 and as such only facilities specifically approved according to PPS 13.39 are authorized to perform priming and painting of major components and complete DASH 8 series 100, 200, 300 and 400 aircraft with the applicable exterior paint system according to this PPS.

4.3.2 Subcontractors must direct requests for approval to DHC Quality.

4.3.3 Facility approval must be based on a facility report, a facility survey and completion of a qualification test program, if required. The facility report must detail the materials and equipment to be used, the process sequence to be followed and the laboratory facilities used to show compliance with the requirements of this PPS. Any deviation from the procedure or requirements of this PPS must be detailed in the facility report. Based upon the facility report, DHC Engineering may identify additional qualification and/or process control test requirements. During the facility survey, the facility requesting qualification must be prepared to demonstrate their capability. Once approved, no changes to subcontractor facilities may be made without prior written approval from DHC Quality.

4.3.3.1 For approval of subcontractor facilities to perform priming and painting of major components and complete DASH 8 series 100, 200, 300 and 400 aircraft with the applicable exterior paint system according to this PPS, completion of a test program and submission of suitable test samples representative of production parts is required. Test samples must meet the requirements specified in section 6.

5 PROCEDURE

5.1 General

5.1.1 For the purposes of this PPS, the term “MRB” (Material Review Board) is considered to include DHC MRB and DHC delegated MRB.

5.1.2 This PPS specifies the procedure and requirements for applying the standard exterior paint system to unpainted aircraft and major components, such as flaps, rudders, etc. as well as repainting of previously painted aircraft.

5.1.3 This PPS also includes the procedure and requirements for applying the following special paint systems for aircraft protection:

- Conductive (aluminized) paint system for lightning strike protection on wing skins of fuel tank areas.
- Conductive (carbon filled) paint system for the dissipation of static electricity on leading edges of fiber-reinforced composites.

5.1.4 When solvent cleaning, deoxidizing or conversion coating as specified herein, begin at the highest point and work downward.

5.1.5 DHC Engineering approves the polyurethane enamel system for the exterior surfaces of all DHC aircraft. For DASH 8 aircraft, the system consists of F19 epoxy primer, F23 intermediate epoxy primer and F24 polyurethane enamel. The exterior paint scheme drawing specifies the paint type, manufacturer and colour for exterior paint on DASH 8 aircraft.

5.1.6 There must be aluminum loaded primer and aluminum loaded enamel on the external skin of the Q100/200 fuel tank between station Yw 171.2 and Yw 261.0 (top and bottom skins for pre mod 8/0024 and top skin only for post mod 8/0024). Surfaces to be painted must have previously been stripped to bare metal. No other finishes (other than chemical conversion coating) are permitted in this area. The preparation and application of aluminum loaded primer and aluminum loaded enamel (including a “not to exceed” thickness) is a fuel tank critical safety item and is classified as a Critical Design Configuration Control Limitation (CDCCL).

5.2 Paint Shop Conditions

5.2.1 Ensure paint spray rooms are equipped with forced or induced ventilation systems capable of maintaining sufficient ventilation to meet Occupational Health and Safety Act requirements. Ensure air is introduced into the room in a manner that does not cause turbulence or excessive air currents, yet is sufficient to prevent dried overspray from settling on tacky surfaces.

5.2.2 Ensure adequate lighting is provided, including undersurface areas.

5.2.3 Wash platforms and floors frequently to avoid build-up of dust and overspray.

5.2.4 Personnel must wear slip-on shoe coverings to avoid carry-over of dust from the spray room floor and to avoid damage to the aircraft surfaces.

5.2.5 Ensure spray rooms are equipped with temperature and humidity indicators.

5.2.6 Refer to the applicable paint or primer PPS for the temperature and relative humidity limits for coating application. Maintain records of readings.

5.3 Preparation of Aircraft

5.3.1 Mask the following areas before solvent cleaning and painting. Use masking tape and paper on areas not sensitive to cleaning solvents (e.g., metallic areas, static ports, etc.). Use aluminum foil tape and solvent resistant paper or foil sheet to mask areas sensitive to cleaning solvents (e.g., non-metallic areas, bearings, etc.). Mask transparent plastic areas according to PPS 10.01.

- Fuel nozzle grounding receptacles
- Static openings and ground points
- Pitot heads, bearings and screw threads
- Working surfaces (i.e., flap tracks)
- Exposed pipes, hoses, electrical cables, except overflow discharge pipes
- Plastic or ceramic insulators
- Transparent plastic (i.e., windows, landing and taxi lights, beacons, navigational lights, etc.)
- Antennae and Retractable landing gear
- Propeller blades
- Engine intake and exhaust
- De-icer boots or dummy boots
- Oil cooler, heat exchanger and other air intake or exhaust openings
- Locks and chrome plated door handles
- Pre-painted components such as rudders, elevators, flaps etc.
- If the engineering drawing specifies removal of access panels so that they can be painted separately, mask the access holes as shown in Figure 1 so that the edges of the recess will be painted
- Door proximity sensor targets
- Other items not requiring cleaning and painting

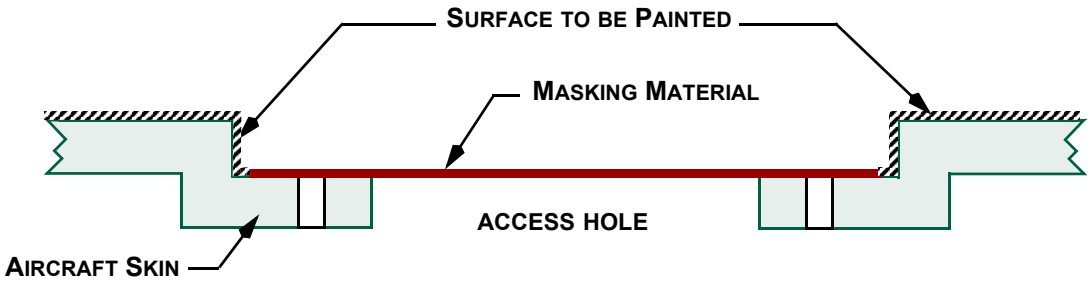

FIGURE 1 - MASKING ACCESS HOLES (CROSS SECTION AT ACCESS HOLE)

5.3.2 After all flight testing and before exterior painting, use a suitable wooden or plastic spatula to scrape away the sealant between each static port and the fuselage skin. Remove the sealant to the extent that allows the paint to enter the gap between the skin and static port (see Figure 2).

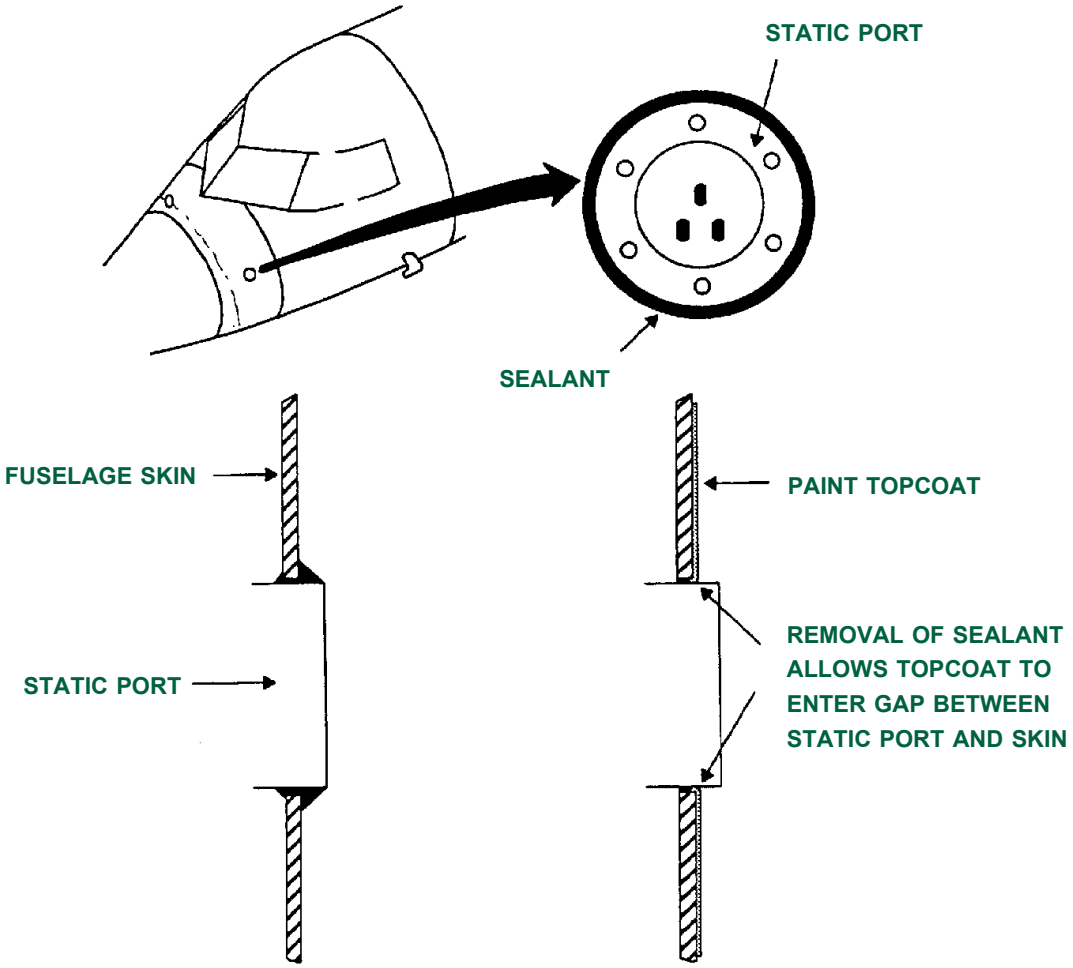

FIGURE 2 - REMOVAL OF SEALANT AROUND STATIC PORTS

5.3.3 Before priming or painting, ensure surfaces are free of moisture from exposure to rain or condensation. Allow aircraft surfaces to reach a minimum temperature of 60°F (16°C). Preparation for priming and painting during this time, however, is acceptable.

5.3.4 Disconnect and isolate main and slave battery leads from batteries before moving the aircraft into the painting area.

5.3.5 Aircraft can be painted with, or without, fuel in the fuel tanks (e.g., aircraft which have been previously fueled, do not have to be re-fueled; and aircraft which have not previously been fueled, can be painted with the fuel tanks empty).

5.3.6 Before priming or painting, electrically ground the aircraft.

5.3.7 If specified on the engineering drawing, remove the access panels so that they can be painted separately. If necessary, remove the access panel sealant using a sealant scraper (see Equipment section, paragraph 4.2.3) and clean the aircraft structure according to PPS 21.21. Prepare the surfaces of removed access panels and prime and paint them according to the procedure specified in this PPS. Ensure that the paint wraps around the edges of the access panels in order to prevent forward facing paint steps on re-installed panels.

5.4 Preparation of Primer and Paint

5.4.1 Except as noted in paragraph 5.4.1.1, paragraph 5.4.1.2 and paragraph 5.4.1.3, prepare primer and paint according to the applicable PPS as specified in section 3.

5.4.1.1 Prepare aluminized F19 primer and F24 enamel as follows:

Step 1. Mix base and catalyst according to PPS 34.08 or PPS 34.03, as applicable. Use the same colour enamel used to paint the wing surfaces adjacent to the fuel tanks.

Step 2. Add 45 grams of aluminum paste (see Materials section, paragraph 4.1.6) for every litre of catalysed mix and stir thoroughly (7.2 oz/gal$_{IMP}$ or 6.0 oz/gal$_{US}$). Maintain records of the amount of aluminum paste added to primer or paint. Note that the preparation of aluminum loaded primer and aluminum loaded enamel for application on the external skin of the Q100/200 fuel tank between station Yw 171.2 and Yw 261.0 (top and bottom skins for pre mod 8/0024 and top skin only for post mod 8/0024) is a fuel tank critical safety item and is classified as a Critical Design Configuration Control Limitation (CDCCL).

Step 3. Continue primer and paint preparation according to PPS 34.08 or PPS 34.03, as applicable.

5.4.1.2 Unless otherwise specified by the engineering drawing, for Tempo 6600 enamel **only,** it is acceptable to add Tempo 6600-A-1 accelerator to the paint according to Table I to reduce the dry to tape time. However, the use of accelerator can result in wrinkles, solvent popping, reduced gloss, etc., as well as reducing the pot life of the enamel and therefore, accelerators should only be used when it is absolutely necessary.

TABLE I - USE OF ACCELERATORS

PAINT	ACCELERATOR	MAXIMUM ACCELERATOR	MIXING INSTRUCTIONS
Tempo 6600	Tempo 6600-A-1	15.6 ml of accelerator per litre of **base** component (2.5 fl oz/gal$_{IMP}$ or 2.0 fl oz$_{US}$/gal$_{US}$)	Add the accelerator to the **base** component 15 minutes before mixing in the catalyst
Note 1. It is **extremely important** that the amount of accelerator used does not exceed the maximum allowed. Note 2. Addition of maximum accelerator will reduce the dry to tape time and the pot life by approximately half, depending upon the temperature and relative humidity.			

5.4.1.3 Prepare Awl-Quik sanding primer by mixing the base and the catalyst in a 1:1 ratio. The mixed primer has the consistency of a thick paste. Do not add any solvent to the primer. The pot life of Awl-Quik sanding primer is 8 hours.

5.5 Surface Preparation

5.5.1 Surface Preparation of Aircraft being Re-Painted

5.5.1.1 If the MRB disposition has specified that an existing paint coating is acceptable as a base for re-painting, prepare the old paint coating for re-painting as follows:

Step 1. Abrade the surface using Scotch-Brite pads (see paragraph 4.2.2) soaked in Jet Clean E (diluted with water in a 1:20 ratio).

Step 2. Remove carbon deposits (exhaust stains), oil, hydraulic fluid and other adhering dirt by scuffing using abrasive paper (120 or 180 grit for vibrating sanders, 220 grit for hand abrading). Pay particular attention to areas around protruding head fasteners, inside corners, etc. Do not use 120 grit on non-metallic surfaces.

Step 3. Prepare replaced or repaired details or assemblies on the aircraft exterior according to section 5.5.2.

Step 4. Dust off scuffed areas with a clean cloth.

5.5.1.2 If the MRB disposition has specified that an existing paint is not acceptable as a base for re-painting, remove the old paint coating as follows. After removing the old paint, prepare the surface for painting according to section 5.5.2.

Step 1. Mask fibre-reinforced parts.

Step 2. Strip the aircraft paint system from the metal surfaces according to PPS 31.07. Do not chemically strip paint from fibre-reinforced parts.

Step 3. If necessary, remove paint from fibre-reinforced parts using abrasive paper (180 or 220 grit) and solvent clean according to PPS 31.17.

5.5.2 Surface Preparation of New Aircraft, Stripped Aircraft and Detail Parts

5.5.2.1 For initial cleaning, solvent clean **all** unmasked areas according to PPS 31.17. In general, it is acceptable to use Scotch-Brite pads soaked with the solvent specified in PPS 31.17 to remove adhering contamination, particularly excess sealant and excess F1 primer from fastener countersinks. However, do not use Scotch-Brite pads on bare anodized surfaces because they may damage the coating.

5.5.2.2 After initial cleaning and before final cleaning, prepare unmasked surfaces according to the procedure specified in Table II.

5.5.2.3 After surface preparation, final clean by solvent cleaning for a second time **all** unmasked surfaces according to PPS 31.17. Except as noted in paragraph 5.5.2.3.1, for **unpainted and unprimed metal surfaces** which are not masked (including surfaces where the paint system has been abraded or stripped away to bare metal), final clean after re-solvent cleaning as follows:

Step 1. For aluminum surfaces, manually deoxidize according to PPS 31.02. Alternatively, in cases where in-situ manual deoxidize is not practical, it is acceptable to mechanically clean using aluminum wool or Scotch-Brite pads followed by dusting off scuffed areas with a clean cloth and solvent cleaning.

Step 2. Manually apply chemical conversion coating according to PPS 32.02.

Step 3. Allow the surface to dry.

Step 4. Solvent clean the surface for the third time according to PPS 31.17 to remove all moisture and loose particles.

5.5.2.3.1 If application of DSC 595 adhesion promoter is specified by the engineering drawing, apply adhesion promoter according to PPS 34.23 in place of the final clean and subsequent steps specified in paragraph 5.5.2.3. In addition, for unpainted and unprimed titanium parts it is acceptable to apply DSC 595 adhesion promoter according to PPS 34.23 in place of the final clean and subsequent steps specified in paragraph 5.5.2.3, even if not specifically specified by the engineering drawing. Ensure a water break-free surface before application of DSC 595 adhesion promoter.

TABLE II - INTERMEDIATE SURFACE PREPARATION

SURFACE	SURFACE PREPARATION (NOTE 1)
Aluminum, anodized	No intermediate surface treatment is required.
Aluminum, untreated or chemically conversion coated (e.g., Alodined)	Abrade the surface using Scotch-Brite pads soaked in Alumiprep #33 or Jet Clean E diluted with water in a 1:20 ratio and rinse the surface thoroughly with water to verify that it is water break-free. Continue to clean until a water break-free surface is achieved.
Composite component aluminum foil or mesh test patch	Step 1. Lightly sand the paint ridge surrounding the exposed aluminum wire or foil test patch with 180 - 240 grit abrasive paper. Take care to avoid damaging the aluminum foil or mesh. Step 2. Solvent clean the patch according to PPS 31.17. Step 3. Apply surface finishing compound to fill any imperfections according to PPS 34.34.
Corrosion Resistant Steel, untreated	Scuff the surface using 120 or 180 grit abrasive paper and then dust off scuffed areas with a clean cloth.
DSC 472 unpaved runway protective tape	Scuff the tape surface using Scotch-Brite pads (see Materials section, paragraph 4.2.2) and then dust off scuffed areas with a clean cloth.

TABLE II - INTERMEDIATE SURFACE PREPARATION

SURFACE	SURFACE PREPARATION (NOTE 1)
F19 Primed	Step 1. Chemically strip the F19 finish from the areas listed below according to PPS 31.07. Before stripping, mask all sealant, plastic surfaces, and composite parts around the area to be stripped as specified in PPS 31.07. • Strip a 4" to 5" wide band around the leading edge of the wings and the vertical stabilizer, beginning at the seal between the composite and metal parts and moving aft (as shown in Figure 3) • Strip a 4" to 5" wide band beginning at the E-Bay composite nose assembly and moving aft (as shown in Figure 4) • Strip the area around the windshield frame as shown in Figure 5 Step 2. For **all** installed flush head fasteners or rivets which have either full circle or partial (smiling or eye brow) blemishes, use a squeegee to apply Awl-Quik sanding primer to the countersink in such a way that **only** the blemish is filled. Under **no** circumstances is it acceptable to cover **any** portion of skin surfaces with the sanding primer. Do not obliterate the outline of the rivet or fastener. Allow the sanding primer to air cure sufficiently to permit sanding (approximately 3 to 4 hours at 110°F ±5°F (43°C ±3°C)) and smooth the surface using 120 grit or finer abrasive paper. Ensure that the clad surface of aluminum skins is not scratched or damaged when sanding the sanding primer. Step 3. Roughen the surface of the F19 primer by scuffing all surfaces not mentioned in Step 1 with abrasive paper (120 or 180 grit for vibrating sanders, 220 grit for hand abrading). Pay particular attention to areas around protruding head fasteners, inside corners, etc. Take care not to penetrate the primer coating and damage the pre-treatment underneath. Step 4. Dust off scuffed areas using a clean cloth.
F21 Primed	If possible, lightly scuff using abrasive paper (120 or 180 grit for vibrating sanders, 220 grit for hand abrading) and then dust off scuffed areas using a clean cloth.
Fibre Reinforced Composite, Unprimed	Lightly scuff surfaces, using abrasive paper, starting with 180 grit and finishing with 320 grit, taking care not to expose or damage the cloth fibres and then dust off scuffed surfaces with a clean cloth.
Painted	Scuff all surfaces using abrasive paper (120 or 180 grit for vibrating sanders, 220 grit for hand abrading) and then dust off scuffed areas with a clean cloth. Pay particular attention to areas around protruding head fasteners, inside corners, etc.
Titanium	Scuff the surface using Scotch-Brite pads and then dust off scuffed areas with a clean cloth. Alternatively, it is also acceptable to chemically clean in-situ according to PPS 31.09, if practical.
Note 1. Do not use 120 grit abrasive paper on non-metallic surfaces.	

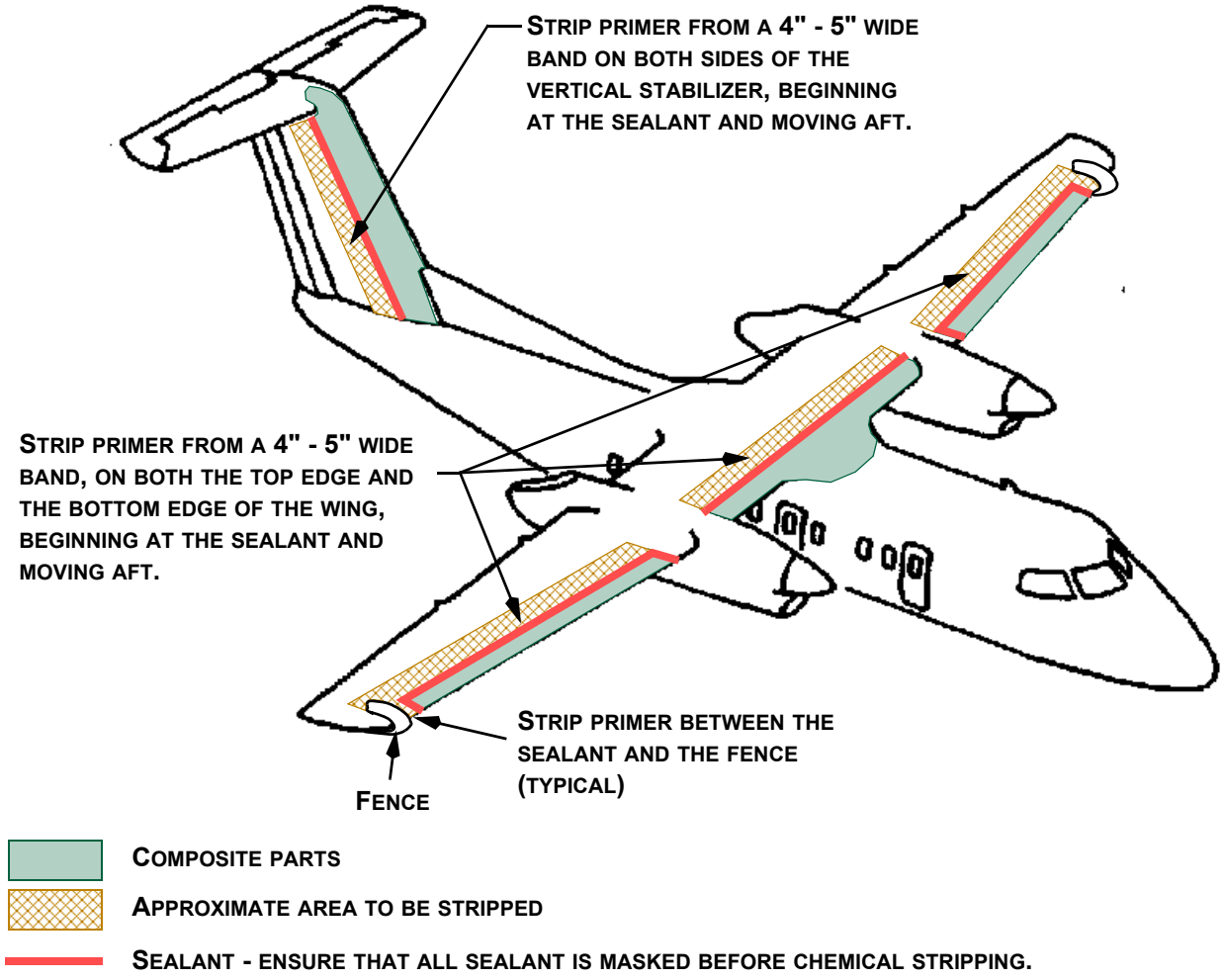

FIGURE 3 - F19 PRIMED AREAS TO BE CHEMICALLY STRIPPED AROUND LEADING EDGE OF WINGS AND VERTICAL STABILIZER

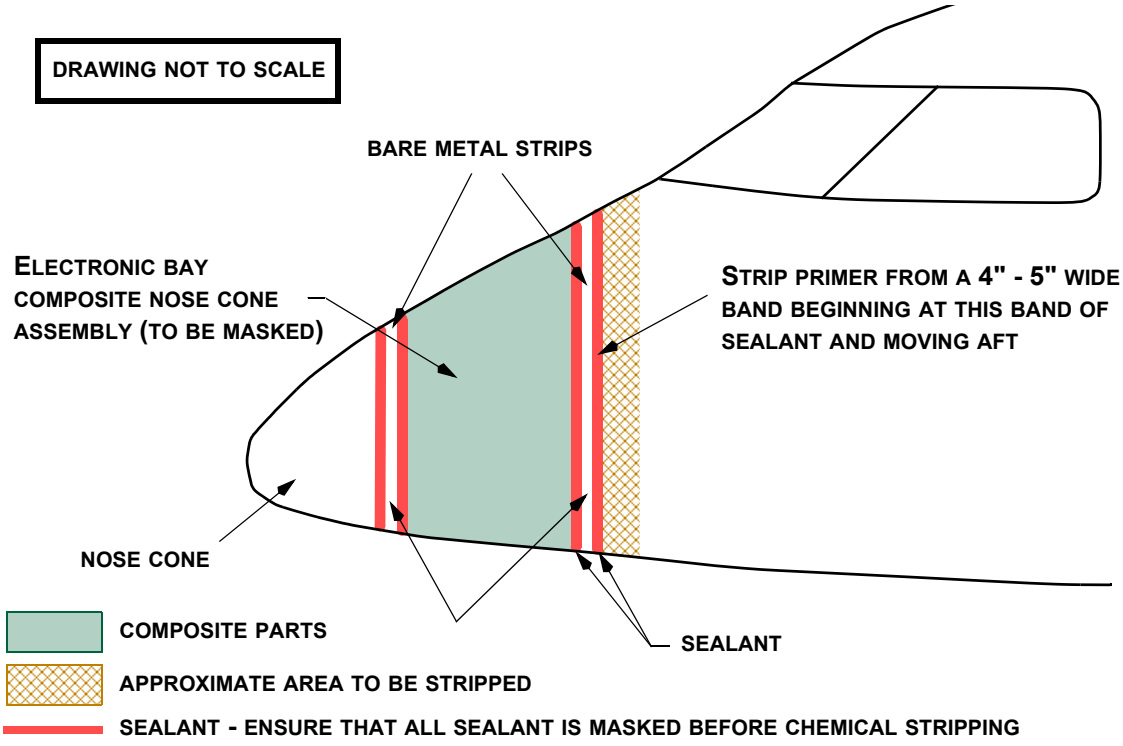

FIGURE 4 - F19 PRIMED AREAS TO BE CHEMICALLY STRIPPED AROUND NOSE ASSEMBLY

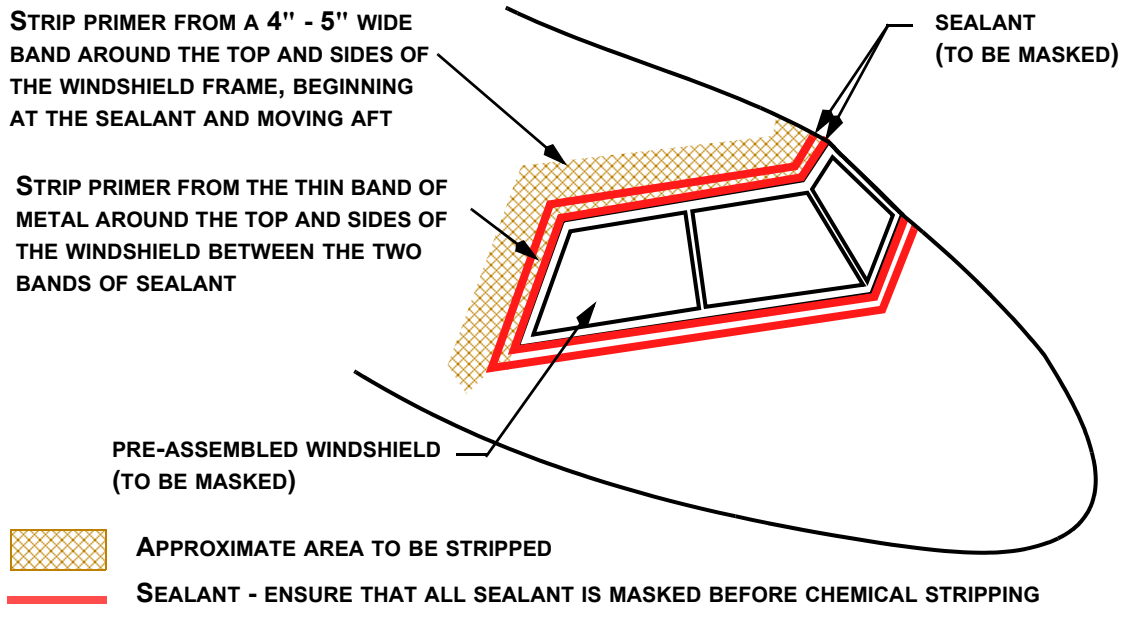

FIGURE 5 - F19 PRIMED AREAS TO BE CHEMICALLY STRIPPED AROUND WINDSHIELD FRAME

5.6 Priming

5.6.1 For new aircraft, stripped parts and detail parts, where use of the F47 primer/base coat/clear coat paint system is specified by the engineering drawing, apply the primer coat to all unmasked surfaces according to PPS 34.25. Where use of F24 enamel is specified by the engineering drawing, apply F23 intermediate primer to all unmasked surfaces as follows:

Step 1. Immediately before priming, tack rag all surfaces to remove particles, dust, etc.

Step 2. Apply a thin even coat of F23 intermediate primer to a dry film thickness of 0.0003" - 0.0005" to all unmasked surfaces.

Step 3. Allow the primer to air dry for a minimum of 2 hours before applying the topcoat.

Step 4. If the F23 primer is not painted over within the maximum allowable overcoat time specified by the primer manufacturer's technical data sheet (TDS), scuff the F23 primer using Scotch-Brite abrasive pads, solvent clean according to PPS 31.17, and apply an additional mist coat of the F23 primer. Allow the mist coat of F23 primer to air dry for a minimum of 2 hours before applying the topcoat. If the primer manufacturer does not specify an applicable maximum allowable overcoat time, the maximum allowable overcoat time must be considered to be 24 hours.

5.6.2 In areas where the engineering drawing specifies the use of aluminized primer and paint (e.g., wing skins in the lightning strike area), prime using F19 aluminized primer, prepared as specified in paragraph 5.4.1.1, as follows:

Step 1. If paint or primer other than aluminized primer has already been applied in the area to which aluminized primer is to be applied, strip that paint or primer according to PPS 31.07. After stripping, manually apply chemical conversion coating to the stripped surface according to PPS 32.02.

Step 2. Mask off the area.

Step 3. Tack rag all surfaces to remove particles, dust, etc.

Step 4. Apply a thin even coat of aluminized F19 primer to a dry film thickness of 0.0004" - 0.0006". Note that application of aluminum loaded primer on the external skin of the Q100/200 fuel tank between station Yw 171.2 and Yw 261.0 (top and bottom skins for pre mod 8/0024 and top skin only for post mod 8/0024) is a fuel tank critical safety item and is classified as a Critical Design Configuration Control Limitation (CDCCL).

Step 5. Allow the primer to air dry for a minimum of 1.5 hours.

5.7 Application of Standard Paint

5.7.1 Avoid using airless spray equipment to apply high solids coatings as micro-blisters or haze may result.

5.7.2 If the engineering drawing specifies use of an F47 primer/base coat/clear coat paint system, apply base coat and clear coat according to PPS 34.25. When applying stripes, insignia and markings, as required, apply this additional base coat before applying the clear coat; before applying additional base coat, re-mask as required.

5.7.3 Apply non-aluminized F24 enamel according to PPS 34.03.

5.7.4 Apply aluminized F24 enamel as follows:

Step 1. Mask off the area to be painted.

Step 2. Immediately before painting, tack rag all surfaces to remove particles, dust, etc.

Step 3. Apply a coat of aluminized F24 enamel approximately 0.001" thick.

Step 4. Allow Grade A enamel to air dry for 20 to 30 minutes and allow Grade B enamel to air dry for 2 hours (120 minutes).

Step 5. Except as noted below, apply a full final coat of aluminized F24 enamel to obtain a total enamel dry film enamel thickness of 0.0020" - 0.0025".

- On the external skin of the Q100/200 fuel tank between station Yw 171.2 and Yw 261.0 (top and bottom skins for pre mod 8/0024 and top skin only for post mod 8/0024) apply a full final coat of aluminized F24 enamel to obtain a total enamel dry film thickness of 0.0017" - 0.0022". It is imperative that the final total dry film thickness of aluminized F19 primer together with aluminized F24 enamel must not exceed 0.0028". Note that the application of aluminum loaded enamel on the external skin of the Q100/200 fuel tank between station Yw 171.2 and Yw 261.0 (top and bottom skins for pre mod 8/0024 and top skin only for post mod 8/0024) is a fuel tank critical safety item and is classified as a Critical Design Configuration Control Limitation (CDCCL).
- Except on the external skin of the Q100/200 fuel tank between station Yw 171.2 and Yw 261.0 (top and bottom skins for pre mod 8/0024 and top skin only for post mod 8/0024), it is acceptable to increase the enamel dry film thickness of F24 to a maximum of 0.005" to achieve full hiding for the following pure TiO_2 white colour numbers: DSC 302-0960G, 6600-W1, 6600-W73 and BAC 7067.

Step 6. Allow the final coat to cure as specified in Table III or Table IV, as applicable.

5.7.5 Apply F31 or F34 anti-static erosion resistant coating according to PPS 34.15.

5.7.6 Where application of F36 unpaved runway protective coating is specified, apply the F36 coating according to PPS 34.18 before applying F24 enamel coatings. If use of F36 unpaved runway protective coating with F47 coating is specified, refer to Liaison Engineering for the application sequence.

5.7.7 Apply F40 polyurethane coating according to PPS 34.18.

5.8 Multi-Colour and Multi-Coat Paint Applications

5.8.1 Before applying additional coatings, re-mask as required.

5.8.2 Apply F24 aluminized paint, prepared as specified in section 5.4, according to PPS 34.03, respectively. Re-mask as required.

5.8.3 Apply additional colours (i.e., stripes, markings, insignia, etc.) according to section 5.7.

5.8.4 Unless otherwise specified by the engineering drawing, for the following rain erosion areas (as shown in Figure 6), apply a supplemental coat of pigmented F24 according to PPS 34.03 or an additional F47 clear coat according to PPS 34.25, as applicable. When applying pigmented F24, refer to the decorative exterior paint scheme drawing for the appropriate pigmentation. Ensure that the total dry film thickness does not exceed the following limits: 0.0055" for F24 and 0.0030" for F47 clear coat.

1. *Radome* - Apply all over exterior surface.
2. *Lower Cowling* - Apply to cowling front below the spinner and around the air intake and backward to a vertical line which coincides with the vertical joint just aft of the latch handle.
3. *Inboard Wing* - Apply to the wing leading edge inboard of de-icing boot and to the leading panel of the wing to fuselage fairing.
4. *Inboard Wing* - Apply to the wing leading edge outboard of the de-icing boot to the nacelle side.
5. *Outboard Wing* - Apply to the wing leading edge between the de-icing boot and the nacelle side. Do not apply to the landing light lens.
6. *Flap Track Fairings (Flap Track #4 and #5)* - Apply to the nose of the fairing.
7. *Outboard Wing* - Apply to the outboard leading edge of the wing between the de-icing boot and the navigation light lens.
8. *Vertical Stabilizer* - Apply to the leading edge between the dorsal fin and the de-icing boot and also between the de-icing boot and the vertical to horizontal stabilizer fairing.
9. *Fairing, Vertical to Horizontal Stabilizer* - Apply all over exterior surfaces.
10. *Pitot Tube* - Apply to the streamlined tube painted leg.

5.8.5 Between coats, cure F24 multi-colour or multi-coat paints according to Table III. For F47 coatings, refer to PPS 34.25 for curing between coats.

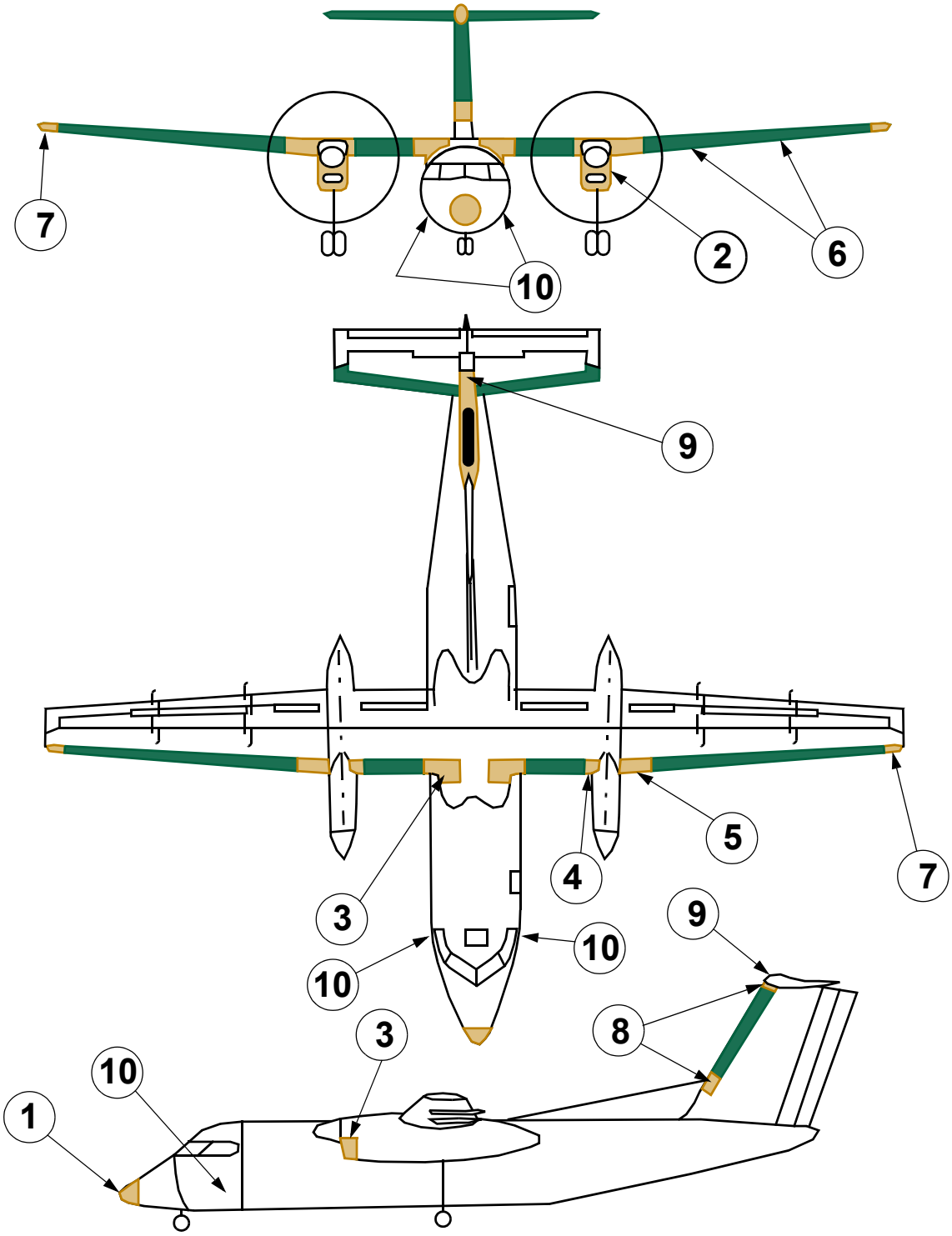

FIGURE 6 - AREAS REQUIRING A SUPPLEMENTAL COAT OF PIGMENTED F24 OR F47 CLEAR COAT

TABLE III - OVERCOATING OF F24 PAINTED SURFACES

F24 DRYING TIMES BEFORE TAPING AND OVERCOATING		F24 TO BE OVERCOATED WITH	TYPE OF OVERCOATING	TOTAL THICKNESS
CONVENTIONAL SOLIDS (GRADE A)	HIGH SOLIDS (GRADE B)			
According to Figure 7 (Note 1)	2 hours Flash-Off followed by 8 hours at 90 ±5°F (32 ±3°C) and 50 ±10% relative humidity	Multi-Colour F24 Polyurethane	Stripes, Insignia and Markings, as required	0.0055" maximum
		F24 Clear Polyurethane	Erosion Protection	0.002" - 0.003"

Note 1. Drying times in Figure 7 are specified to facilitate production. Drying times may vary depending on film thickness, temperature, humidity and colour.

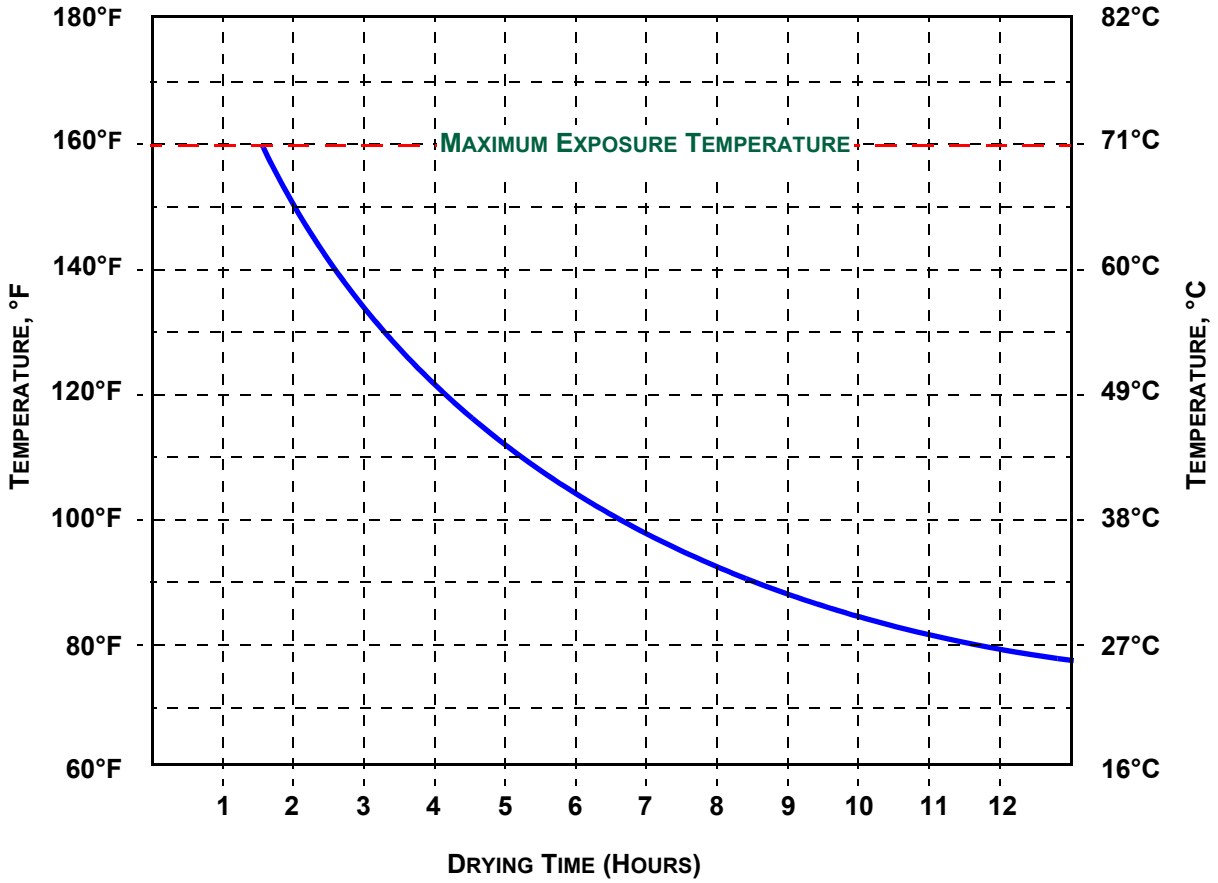

FIGURE 7 - ACCELERATED CURE TO TAPE TIME FOR F24 GRADE A PAINTS

5.8.6 Where specified by the engineering drawing, apply F24 non-skid coatings as follows:

Step 1. Apply clear F24 enamel over the cured exterior paint.

Step 2. Sprinkle non-skid material as specified in PPS 16.05 over the F24 clear coat.

Step 3. Spray another coat of F24 clear over the non-skid material.

5.8.7 Where specified by the engineering drawing, apply non-skid coatings to F47 coatings as follows:

Step 1. After applying the F47 clear coat, sprinkle non-skid material as specified in PPS 16.05 over the cured F47 clear coat.

Step 2. Spray another coat of F47 clear coat over the non-skid material.

5.9 Post Painting Procedure

5.9.1 Re-seal the gap between the static port and fuselage skin according to PPS 21.06.

5.9.2 If specified on the engineering drawing, seal forward facing paint edges according to PPS 21.06.

5.9.3 After paint curing according to section 5.10, re-seal the gap between the static port and fuselage skin according to PPS 21.06.

5.9.4 Allow F24 coated access panels, which were removed and painted according to paragraph 5.3.7, to “cure to handle” according to PPS 34.03 before re-installing and sealing according to PPS 21.19. For F47 coated access panels, allow to cure according to PPS 34.25 before re-installing and sealing according to PPS 21.19. Touch-up the fastener heads and the cured sealant around the access panels using paint matching the surrounding structure.

5.10 Final Curing of Painted Aircraft

5.10.1 Refer to Table IV for the minimum final cure time and temperature requirements. Ensure that the relative humidity is between 30% and 80% during final curing.

TABLE IV - FINAL CURING OF PAINTED AIRCRAFT

TYPE OF PAINT	APPLICABILITY	MINIMUM CURING TIME	
		@ 77°F (25°C) MINIMUM	ACCELERATED CURE (NOTE 1)
Enamel Paint (F24, F31, F34)	Before any outdoor exposure	16 hours	1 hour at a minimum of 77°F (25°C) (to allow solvent flash-off) followed by 4 hours at a minimum of 110°F (43°C)
Clear F24 (regular drying)		12 hours	n/a
Clear F24 (fast drying)		8 hours	3 hours at a minimum of 77°F (25°C) followed by 3 hours at 100°F - 120°F (38°C - 49°C)
Enamel Paint (F24, F31, F34 and clear F24)	Before exposure to rain or engine oil and before engine runs or flying in clear weather	72 hours	7 hour at a minimum of 77°F (25°C) followed by 4 hours at a minimum of 110°F (43°C)
	Before flying in rain and before exposure to hydraulic fluid	7 days	7 hours at a minimum of 77°F (25°C) followed by 12 hours at a minimum of 110°F (43°C) followed by 1 day air dry at a minimum of 77°F (25°C)
F47 primer/base coat/clear coat	Cure according to PPS 34.25.		

Note 1. Accelerated cure ovens or areas (conventional or infrared (IR)) must be qualified according to BAPS 138-055, Rev. D, (including temperature uniformity survey according to BAERD GEN-007, Rev. C).

5.11 Rework of Damaged or Defective Coatings

5.11.1 Remove dried overspray and paint runs as follows:

Step 1. After allowing the coating to cure for at least 24 hours, abrade the surface with abrasive paper. Use increasingly finer abrasive paper, ending with 320 grit.

Step 2. Buff the surface until it blends in with the rest of the area.

5.11.2 Touch up small pits and scratches by brush.

5.11.3 Repair minor defects other than those referenced above as follows:

Step 1. Locally strip according to PPS 31.07.

Step 2. Feather edge the old finish adjacent to the stripped area by sanding with abrasive paper and wiping with a tack rag.

Step 3. If the base material is exposed, spot in pre-treatment coating to match the existing, lapping slightly over the old finish.

Step 4. Repaint the area according to the procedure specified herein.

6 REQUIREMENTS

6.1 Visual Examination Requirements

6.1.1 Examine **all** painted aircraft surfaces, including those not readily visible from ground level, for damage (such as scratches), defects (such as blemishes, runs, sags, pits, streaks, excessive orange peel, dried overspray, blisters, peeling, solvent popping, etc.) and other irregularities that impair appearance or protective qualities.

6.1.2 If possible, rework damaged or defective coatings according to section 5.11. Refer defects covering large parts of the wing or fuselage to MRB for disposition.

6.2 Film Thickness Requirements

6.2.1 Measure the dry film thickness of the base primer coat at the 24 locations shown in Figure 8 before the aircraft is painted using a dry film thickness gauge (see Equipment section, paragraph 4.2.9). Refer coatings that fail to meet the dry film thickness requirements specified in Table V to MRB for disposition.

6.2.1.1 For Q100/200 aircraft, in addition to the 24 locations shown in Figure 8, measure the dry film thickness of aluminized F19 primer applied on the external skin of the fuel tank between station Yw 171.2 and Yw 261.0 (top and bottom skins for pre mod 8/0024 and top skin only for post mod 8/0024) at the locations shown in Figure 9. For coatings that fail to meet the dry film thickness requirements, strip the primer to bare metal and re-apply as specified herein (including checking of dry film thickness). Note that the preparation and application of aluminum loaded primer in this area is a fuel tank critical safety item and is classified as a Critical Design Configuration Control Limitation (CDCCL).

6.2.2 Maintain records of all dry film thickness measurements.

6.2.3 After the paint system has fully cured, measure the dry film thickness at the previously measured and recorded primer thickness locations (each reading must be taken within 12 inches of the prior reading). Deduct the primer thickness from the total instrument reading to obtain the top coat enamel dry film thickness. Refer coatings that fail to meet the dry film thickness requirements specified in the paint PPS to MRB for disposition.

6.2.3.1 For Q100/200 aircraft, in addition to the 24 locations shown in Figure 8, measure the dry film thickness of aluminized F24 enamel applied on the external skin of the fuel tank between station Yw 171.2 and Yw 261.0 (top and bottom skins for pre mod 8/0024 and top skin only for post mod 8/0024) at the locations shown in Figure 9. For coatings that fail to meet the dry film thickness requirements, strip the primer and enamel to bare metal and re-apply the aluminized primer and enamel as specified herein (including checking of dry film thickness). Note that the preparation and application of aluminum loaded primer and enamel in this area is a fuel tank critical safety item and is classified as a Critical Design Configuration Control Limitation (CDCCL).

TABLE V - DRYING TIMES AND FILM THICKNESSES OF PRIMER AND PAINT SYSTEMS

PRIMER OR PAINT TYPE	NUMBER OF COATS	DRYING TIMES (NOTE 1)	TOTAL THICKNESS
F19 Type 2 or Type 3 Epoxy Primer	1 even wet coat on areas primed at the detail stage	1 to 1.5 hours before overcoating with F22 or F24	0.0002" - 0.0004"
	1 even coat on areas not primed at the detail stage	1 to 1.5 hours before overcoating with F24	0.0004" - 0.0006" (Note 2)
F23 Epoxy Primer	1 even coat	2 to 24 hours before overcoating with F24	0.0003" - 0.0005"
F24 Clear Polyurethane	2 full coats	Grade A: 20 to 30 minutes between coats Grade B: 2 hours between coats	0.002" - 0.003"
		See Table IV for final curing	
F24 Polyurethane Enamel	2 wet coats	Grade A: 20 to 30 minutes between coats Grade B: 2 hours between coats	0.0020" - 0.0025" (Notes 2, 3 & 4)
	final full coat	See Table III or Table IV, as applicable	
F47 Primer/Base Coat/Clear Coat	Refer to PPS 34.25 for film thickness requirements.		

Note 1. Drying times may vary depending on film thickness, temperature, and humidity.

Note 2. On the external skin of the Q100/200 fuel tank between station Yw 171.2 and Yw 261.0 (top and bottom skins for pre mod 8/0024 and top skin only for post mod 8/0024) the total dry film thickness of aluminized F19 primer must be 0.0004" - 0.0006" and the total dry film thickness of aluminized F24 enamel must be 0.0017" - 0.0022". It is imperative that the final total dry film thickness of aluminized F19 primer together with aluminized F24 enamel must not exceed 0.0028". Note that the application of aluminum loaded primer and enamel on the external skin of the Q100/200 fuel tank between station Yw 171.2 and Yw 261.0 (top and bottom skins for pre mod 8/0024 and top skin only for post mod 8/0024) is a fuel tank critical safety item and is classified as a Critical Design Configuration Control Limitation (CDCCL).

Note 3. Except on the external skin of the Q100/200 fuel tank between station Yw 171.2 and Yw 261.0 (top and bottom skins for pre mod 8/0024 and top skin only for post mod 8/0024), it is acceptable for the enamel dry film thickness of F24 to be a maximum of 0.005" to achieve full hiding for the following pure TiO_2 white colour numbers: DSC 302-0960G, 6600-W1, 6600-W73 and BAC 7067.

Note 4. The maximum total dry film thickness of F24 in areas with a supplemental coat of F24 as specified in paragraph 5.8.4 is 0.0055".

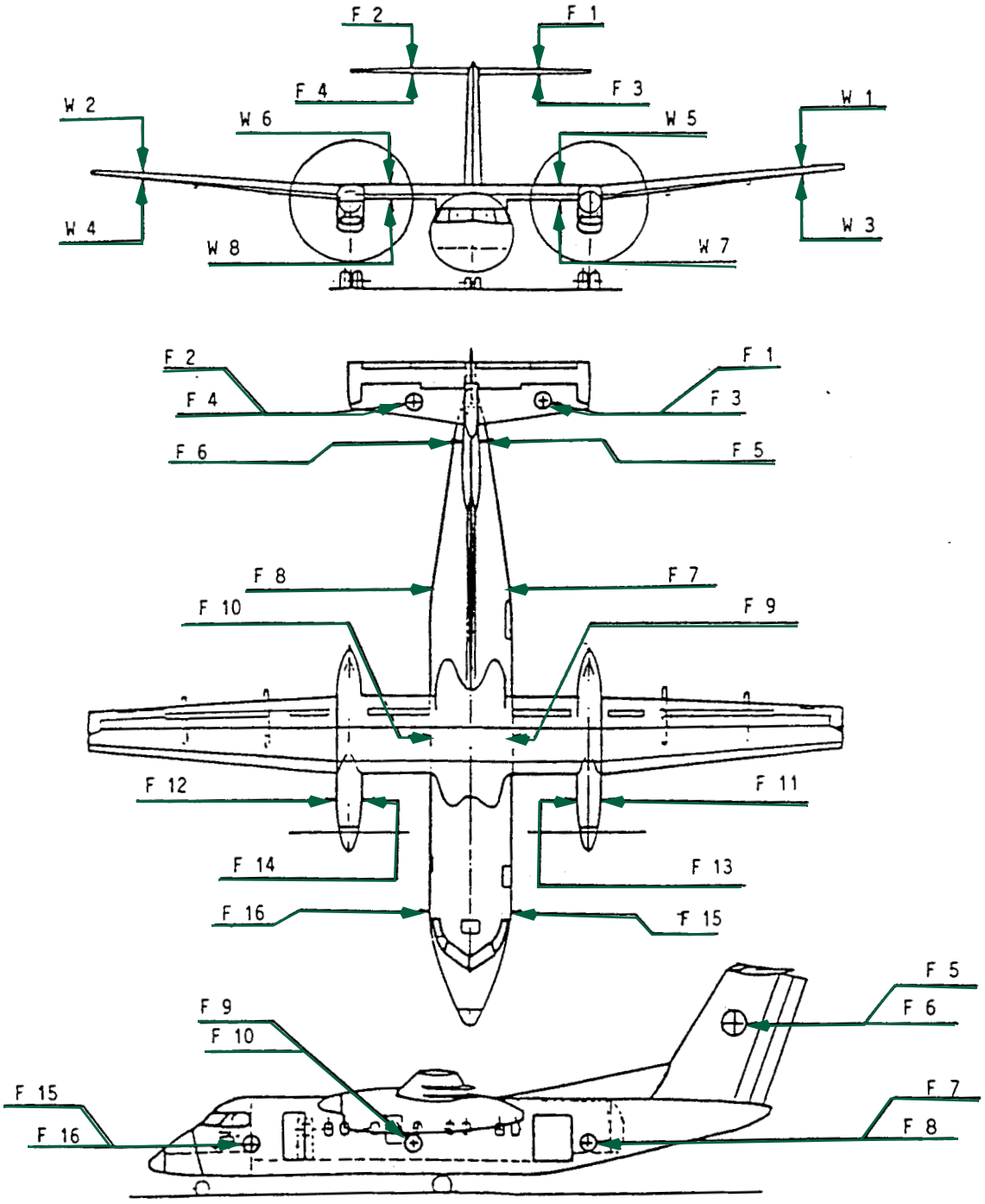

FIGURE 8 - LOCATIONS FOR MEASURING DRY FILM THICKNESS

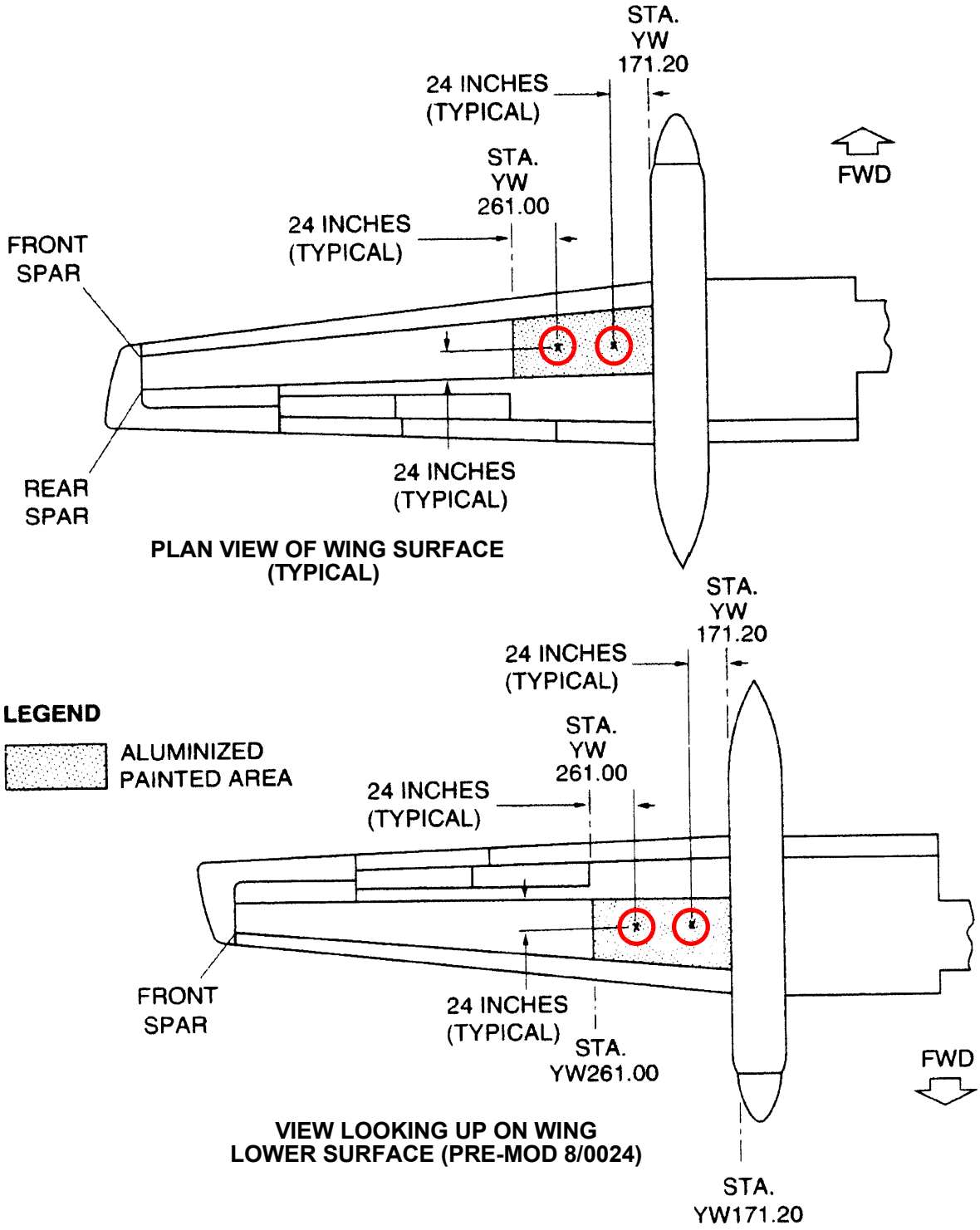

FIGURE 9 - CHECKING OF DRY FILM THICKNESS OF ALUMINIZED PRIMER AND ENAMEL APPLIED TO THE EXTERNAL SKIN OF Q100/200 FUEL TANKS

6.3 Dry Adhesion Tape Test

6.3.1 Perform dry adhesion tape tests as follows:

Step 1. Ensure that the paint system has fully cured. Also, allow the cured paint system to dry for a minimum of 3 hours after exposure to rain, dew, condensation, washing, etc. (do not conduct the tape test on a damp paint film).

Step 2. Apply tape (see Equipment section, paragraph 4.2.4) to the painted surface at the locations indicated in Figure 10. Do not apply the tape to paint bridging gaps, such as fasteners or skin joints.

Step 3. Apply moderate pressure to the surface of the tape to ensure full adhesion.

Step 4. In an abrupt motion against the direction of application, pull the tape off the painted surface.

Step 5. Examine the area for evidence of paint adhesion failure. If there is any evidence of paint lifting, refer the represented coating to MRB for disposition.

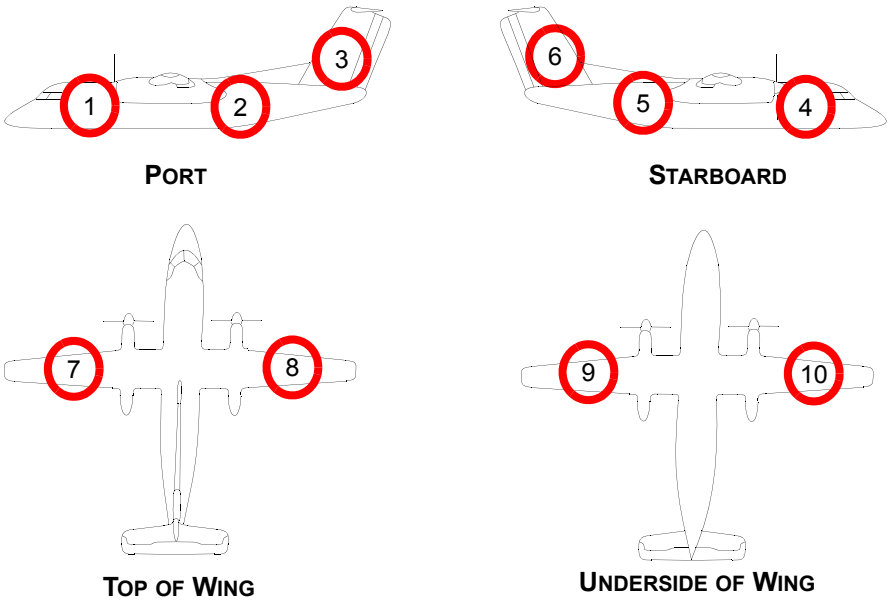

FIGURE 10 - DRY ADHESION TAPE TEST LOCATIONS

6.4 Control of Primers and Paints

6.4.1 Control primers and paints according to the primer or paint PPS.

6.5 Use of Accelerators

6.5.1 Unless otherwise specified by the engineering drawing, accelerators must be used only when necessary and only with products specified in paragraph 5.4.1.2. Ensure that the amount of accelerator used does not exceed the maximum allowable amount specified in Table I.

7 DHC SAFETY PRECAUTIONS

7.1 The safety precautions specified herein are specific to DHC to meet Canadian Federal and Provincial government environmental, health and safety regulations. It is strongly recommended that other facilities consider these safety precautions; however, suppliers, subcontractors and partners are responsible for ensuring that their own environmental, health and safety precautions satisfy the appropriate local government regulations.

7.2 Observe standard plant safety precautions when performing the procedure specified herein.

7.3 Refer to PPS 31.17 for the safety precautions for handling and using solvents.

7.4 Do not smoke or eat in paint spraying areas.

7.5 Remove and isolate the main and slave battery leads from batteries before moving the aircraft to the paint application area.

7.6 Electrically ground the aircraft during cleaning and painting.

7.7 Do not allow open flames or naked lights in painting areas. Do not use infra-red or other heat lamps in the paint application area.

7.8 Avoid inhalation of fumes and vapours from mixed coatings and components. Wear protective respiratory equipment according to PPS 13.13 when working with solvents, mixed coatings or coating components.

7.9 Wear protective aprons, rubber gloves and DHC approved safety glasses when mixing or handling coatings or components. Wear air-tight coveralls and rubber gloves when spraying mixed coatings. Avoid skin contact with mixed coatings or their components. If contact occurs, wash thoroughly with soap and water. If accidental eye contact occurs, flush eyes immediately with large quantities of water at an eye wash station and report to the Health Centre.

7.10 Polyurethane enamel catalysts contain isocyanates. Be familiar with the safety precautions specified in the MSDS and herein before handling or using such materials.

7.11 If mixed coatings containing isocyanate or components containing isocyanate are spilled, clear the immediate area of all personnel and clean the spill according to the appropriate in-house operating procedure or work instruction. Dispose of rags, wipers, empty containers or paper contaminated with mixed paint containing isocyanate, or raw catalyst containing isocyanate, according to the appropriate in-house operating procedure or work instruction.

8 PERSONNEL REQUIREMENTS

8.1 This PPS has been categorized as a Controlled Special Process according to PPS 13.39. Refer to PPS 13.39 for personnel requirements.

9 DISPOSAL OF CHEMICAL WASTES

9.1 Dispose of all chemical wastes according to national legislation and local regulations. At DHC, dispose of chemical wastes according to EHS-OP-005.

9.2 At DHC, dispose of chemical contaminated work clothes, rags, etc., into Red Containers labelled “Waste Rags”.

10 ADDITIONAL INFORMATION

10.1 Always use the oldest stock first (i.e., first in/first out (FIFO) basis).

10.2 Store primer and paint according to the applicable primer or paint PPS.

10.3 Store Awl-Quik sanding primer components in a dry area at a temperature of 40°F - 100°F (4°C - 38°C). For optimum storage life a temperature of 60°F - 80°F (16°C - 27°C) is recommended. Refer to PPS 13.28 for the storage life of Awl-Quik sanding primer components.

10.4 Clean equipment promptly to avoid dried paint on or in the equipment.