#### TKS ANTI-ICE LEADING EDGE POROUS PANEL - MAINTENANCE PRACTICES

### 1. General

- A. This section contains the removal and installation procedures for the TKS anti-ice porous panels, which include the wing, wing strut, and horizontal and vertical stabilizer leading edges. The sealing procedures for the porous panels are also included in this section. The procedures apply to the cargo pod and the fairing TKS system installation.
- B. After a porous panel is replaced, it is necessary to do the purge and test procedures. Those procedures are in TKS Antilce Leading Edge Porous Panel - Adjustment/Test.
- C. Recommended maintenance to keep the TKS fluid at its correct viscosity is as follows:
  - Operate the pumps monthly, or as necessary, in the HIGH mode until the air is removed from the fluid system.
  - Keep the TKS system operational at all times to keep air pockets out of the system.
  - If the fluid tank is removed and installed or replaced, do the porous panel purge and test procedures.

#### NOTE: If the fluid is too thick, the porous panels can become blocked or clogged.

## 2. Tools and Equipment

A. For a list of tools and equipment, refer to Ice and Rain Protection - General.

WARNING: For health and environmental data, review the applicable Safety Data Sheet (SDS).

- WARNING: Immediately remove (clean) or contain all the TKS fluid that is spilled. TKS fluid on the floor will cause a slip hazard.
- WARNING: Discard all unwanted TKS fluid and/or dirty cloths correctly. TKS fluid is a hazardous waste and must be discarded in accordance with approved procedures.
- CAUTION: Do not use MEK, acetone, paint thinner, or similar chlorinated solvents on the porous panels. To prevent damage, only use water and detergent, isopropyl alcohol, and/or approved anti-ice fluid on the porous panel surfaces.

## 3. TKS Porous Panel Removal/Installation

- A. Remove the Porous Panel (Refer to Figure 201 and Figure 202).
  - WARNING: Before you disconnect components of the TKS anti-ice system, slowly loosen the coupling that is connected to the component to be removed because it is possible that high pressure is still in the system.
  - CAUTION: Do not use MEK, acetone, paint thinner, or similar chlorinated solvents on the porous panels. To prevent damage, only use water and detergent, isopropyl alcohol, and/or approved anti-ice fluid on the porous panel surfaces.
  - CAUTION: Use only approved TKS fluids in accordance with specification DTD 406B. Fluid density is approximately 9.2 lbs/gal.
  - CAUTION: Use only clean, filtered fluid in the TKS system. Contamination will cause fluid blockage and/or damage to the porous panel.
  - CAUTION: Do not use the seals again after you loosen or disconnect a tube coupling. Replace the 3/16-inch and 5/16-inch sealing ring and/or 1/2-inch O-ring, as applicable, when you assemble a tube coupling. Examine the seal for damage and make sure that it is in the correct position in the coupling as shown in Figure 203. This will help to prevent fluid leakage from the coupling. Refer to TKS Anti-Ice Fluid Distribution System - Maintenance Practices for Nylon Tubing Repair/Replacement.
  - CAUTION: After you remove and before you install a porous panel, apply low-adhesive tape on the panel to give it protection.
  - CAUTION: Before you remove or install a porous panel, apply low-adhesive tape on the skin adjacent to the panel to give the skin protection.
  - CAUTION: Be careful when you remove and install the porous panels. The panels are easily damaged. Use nonmetallic tools, if possible, to prevent tears, gouges, scratches, and other damage.
  - NOTE: The panel purge and test procedures are only necessary after you install a replacement porous panel.
  - NOTE: The removal and installation of the porous panels are typical.

- (1) Remove external electrical power from the airplane.
- (2) Disengage the circuit breakers on the left circuit breaker panel that follow:
  - PRIMARY ANTHCE
  - W/S ANTHCE
  - BACKUP ANTHCE.
- (3) To remove the wing porous panels, remove wing access panels 501AB and 501DB left inboard, 503CB left center, 503GB and 503JB left outboard, or 601AB and 601DB right inboard, 603CB right center, or 603GB and 603JB right outboard as applicable. Refer to Chapter 6, Access Plates and Panels Identification Description and Operation.
- CAUTION: Before you remove or install a porous panel, apply low-adhesive tape on the skin adjacent to the panel to give the skin protection.
- (4) To remove the stabilizer porous panels, remove tailcone access panel 373BL, 374BR, and 341C. Refer to Chapter 6, Access Plates and Panels Identification Description and Operation.
- (5) Apply tape on the leading edge next to the sealant along the panel edges.
  - NOTE: The tape will give a guide to help apply new sealant when the new panel is installed.
- (6) Carefully remove the sealant along the panel edges.
- (7) Remove the rivets and/or screws, as applicable, that attach the panel to the leading edge.
  - NOTE: The wing and wing strut panels have only rivets installed. The vertical stabilizer panels has rivets and screws installed.
- (8) Disconnect the tubing from the coupling if it is accessible.
  - NOTE: On the vertical stabilizer panel and strut panel the panel must be removed to get access to the tubing.
- (9) Install caps on all tube ends to keep FOD out of the TKS system.

CAUTION: While pulling the panel away from the leading edge, be careful not to damage the leading edge by prying against it.

- (10) Carefully use a flexible-blade knife (putty knife) and your hands to pull the panel away from the leading edge.
- (11) Carefully remove the panel from the leading edge.
- (12) Remove all remaining sealant from the leading edge.
- B. Install the Porous Panel (Refer to Figure 201 and Figure 202).
  - (1) Apply primer to the leading edge area where the porous panel is to be installed. Refer to Chapter 20, Interior and Exterior Finish Cleaning/Painting Maintenance of the Interior and Exterior Primary Coatings and Topcoat.
  - (2) Put the porous panel in it correct position on the leading edge.
  - (3) Apply masking tape or equivalent) on the airplane skin around the perimeter of the porous panels.
    NOTE: This will allow you to fillet seal around the edges of the porous panels.
  - (4) Drill the rivet and screw holes to match the existing hole locations on the leading edge.
  - (5) Remove the caps from the tube ends.
  - (6) Install new seals in the tubing ends as shown in Figure 203.

CAUTION: Before you install or remove a porous panel, apply low-adhesive tape on the panel to give it protection.

- (7) Do the porous panel sealant procedures. Refer to TKS Porous Panel Sealant Procedure in this section.
- (8) Hold the panel in position near the leading edge and connect the tubing.
  - (a) Tighten the coupling with your fingers.
  - (b) Continue to tighten the coupling with a wrench approximately 180 degrees more.
- (9) Align the panel and install temporary fasteners to hold the panel in position.
- (10) Push the panel against the leading edge with enough pressure to cause the sealant to squeeze out along the edges.
- (11) Keep applying pressure until the tape strips or ratcheting straps are applied to hold the panel in position.
  - (a) Make sure that the panel edges are against the leading edge skin.

- CAUTION: To spread the load where ratcheting straps are used, use metal angles to protect the trailing edge. Place blankets or foam between the metal angles and the trailing edge. Do not use too much force when you tighten the straps.
- (12) Use tape strips or racheting straps, as necessary, to hold the panel tightly against the leading edge.

NOTE: Since more sealant is used on the inboard wing panels it is necessary to use racheting straps for these panels around the wing to maintain pressure on the panel while the sealant cures.

- (13) Install the rivets and/or screws, as applicable, that attach the panel to the leading edge.
  - NOTE: The wing and wing strut panels only use rivets. The stabilizer panels have rivets and screws installed.
  - (a) Examine the rivet heads and/or screw heads for correct installation.
  - (b) Use Type I or Type XIV, Class B-2 sealant to apply a shank seal to the rivets. Refer to Chapter 20, Fuel, Weather, and High Temperature Sealing.
  - (c) On the vertical stabilizer panel only, torque the screws to 12 to 15 inch-pounds (1.35 to 1.69 N-m).
- (14) Use Type I, Class B sealant to fillet seal around the edges of the porous panel. Refer to Chapter 20, Fuel, Weather, and High Temperature Sealing.
  - (a) Apply the sealant in the 0.12 inch area between the tape and the porous panel. Refer to Figure 202.
    NOTE: Make sure that the sealant touches the edge of the porous panel at all positions.
- (15) After the sealant is cured, remove all tape and racheting straps.
- (16) Electrically bond all porous panels. Refer to Chapter 20, Electrical Bonding- Maintenance Practices.
- (17) Do the panel purge and test procedures. Refer to TKS Anti-Ice Leading Edge Porous Panel Adjustment/Test.
- (18) Do a leak check follows:
  - (a) Engage the circuit breakers on the left circuit breaker panel that follow:
    - PRIMARY ANTI-ICE
    - W/S ANTHCE
    - BACKUP ANTHCE.
  - (b) Supply external electrical power to the airplane.
  - (c) Put the EXTERNAL POWER switch (S17) on the circuit breaker switch panel to the BUS position.
  - (d) Put the ANTI-ICE-FLUID CONTROL, PRIMARY switch (SI022) on the left switch panel to the HIGH position.
    - <u>1</u> Make sure that there is no fluid leakage from the couplings.
  - (e) Put the ANTI-ICE-FLUID CONTROL, PRIMARY switch on the left switch panel to the OFF position.
  - (f) Put the EXTERNAL POWER switch on the circuit breaker switch panel to the OFF position.
- (19) Clean the floor and the airplane surfaces as necessary.
- (20) Install wing access panels 501AB and 501DB left inboard, 503CB left center, 503GB and 503JB left outboard, or 601AB and 601DB right inboard, 603CB right center, or 603GB and 603JB right outboard as applicable. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.
- (21) Install tailcone access panels 373BL, 374BR, and 341C, if applicable. Refer to Chapter 6, Access Plates and Panels Identification Description and Operation.
- (22) Remove external electrical power from the airplane.

# 4. TKS Porous Panel Sealant Procedure

- CAUTION: Do not use MEK, acetone, paint thinner, or similar chlorinated solvents on the porous panels. To prevent damage, only use water and detergent, isopropyl alcohol, and/or approved anti-ice fluid on the porous panel surfaces.
- A. Apply the Sealant (Refer to Figure 202).
  - (1) Lightly abrade the airplane leading edge with a ScotchBrite pad.
  - (2) Use isopropyl alcohol to scrub the area of the leading edge with a sponge or short-bristle brush where the panel will be installed.
    - (a) Use a clean lint-free cloth to dry the area before the cleaning solution evaporates.

- (3) Use a clean lint-free cloth that is wet with isopropyl alcohol to clean the leading edge.
  - (a) Use a clean lint-free cloth to dry the area before the cleaning solution evaporates.
- (4) Use a clean lint-free cloth that is wet with isopropyl alcohol to clean the aft surface of the panel.
  - (a) Use a clean lint-free cloth to remove debis and contaminants from the surface of the panel.
- (5) Use a clean lint-free cloth that is wet with isopropyl alcohol to clean the surface again.
  - NOTE: Wipe in approximately 12 to 15 inch sections.
  - (a) Use a clean lint-free cloth to dry the area immediately before the isopropyl alcohol evaporates.
- Wipe the surface of the panel with a clean lint-free cloth to make sure that there is no debis and contaminants.
  NOTE: If the cloth shows signs of debris or contaminants clean the area again.
- (7) On all panels except the inboard wing panel, Use Type I or Type XIV, Class B-2 sealant to seal the void on the upper and lower backshell joggle, down the center (0.50-inch (12.7 mm) fay seal), and around the feed inlet and air bleed valve. Refer to Figure 202, and Chapter 20, Fuel, Weather, and High Temperature Sealing.
- (8) On the inboard wing panels, apply Type I or Type XIV, Class B-2 sealant to all of the back surface of the panel, and to the feed input and bleed valve.

NOTE: On the inboard wing panels approximately 65 ounces (1.92 I) of sealant is needed to make sure there are no air pockets between the panel and the wing leading edge.

- (9) Use Type I or Type XIV, Class B-2 sealant to shank seal around each rivet and/or screw hole in the leading edge skin. Refer to Chapter 20, Fuel, Weather, and High Temperature Sealing.
- (10) Install the porous panel on the leading edge. Refer to TKS Porous Panel Removal/Installation in this section.



Figure 201 : Sheet 1 : TKS Anti-Ice System Flow Diagram



Figure 201 : Sheet 2 : TKS Anti-Ice System Flow Diagram









Figure 202 : Sheet 3 : TKS Porous Panel Installation

2610T7004







Figure 203 : Sheet 2 : TKS Nylon Tubing Assembly



Copyright © Textron Aviation Inc.

Retain printed data for historical reference only. For future maintenance, use only current data.



Figure 8 : Sheet 1 : Right Lower Wing Panels



Figure 9 : Sheet 1 : Aft Fuselage, Horizontal and Vertical Stabilizer Panels