TKS ANTI-ICE SYSTEM - CLEANING/PAINTING

1. General

- A. This section gives the procedures for the cleaning of the TKS system components and distribution system. The procedures include cleaning the TKS system after being contaminated with fuel or water.
- B. TKS Fluid Contamination (Fuel) Found.
 - (1) To remove TKS fuel contamination refer to TKS Fluid Contamination (Fuel) Removal.
- C. TKS Fluid Contamination (Water) Found.
 - (1) To remove TKS water contamination refer to TKS Fluid Contamination (Water) Removal.
- D. Porous Panels Unserviceable (Contamination).
 - (1) If there is unserviceable flow on one or more porous panels and you suspect TKS system contamination refer to TKS Anti-Ice System Troubleshooting.

2. Tools and Equipment

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

3. TKS Fluid Contamination (Fuel) Removal

- NOTE: If there was fuel contamination in the fluid, but system was not operated, it is not necessary to replace the filter assembly.
- WARNING: For health and environmental data, review the applicable Safety Data Sheet (SDS).
- WARNING: Slowly loosen the coupling that is connected to the component of the TKS system before you remove components. It is possible that the system continues to have pressure.
- WARNING: If TKS fluid is spilled, immediately remove (clean) or contain all the TKS fluid. TKS fluid on the floor causes a dangerous condition.
- WARNING: Before you operate the TKS system, put plastic sheets or absorbent cloths below the porous panels. This keeps the TKS fluid off the floor which helps prevent injury to personnel.
- WARNING: TKS fluid is a hazardous material. You must discard all unwanted TKS fluid and/or dirty cloths. Refer to approved procedures.
- 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, if necessary, 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 202. This will help to prevent fluid leakage from the coupling.
- CAUTION: Do not use the coupling nut to clench the olive to the fluid tubing. Use only specified clenching tools to do the clenching operation. Also, do not torque the couplings too much during the repair or replacement procedure. If the couplings leak, install new seals as necessary.
- CAUTION: Clench the olive to the tubing without a sealing ring in position. If you clench the olive with the sealing ring in position, you will prevent correct clench and the sealing ring will be unserviceable.
- CAUTION: Do not operate the windshield pump for more than 10 seconds continuously, and wait 10 seconds between pump operations before you operate the pump again. Damage to the windshield pump can occur if the pump is operated for more than the specified limit.
- A. Remove the TKS Fluid Contamination (Fuel) (TKS System Not Operated).
 - (1) For airplanes with the cargo pod installation do the steps that follow:
 - (a) Open the aft-center cargo pod door to get access to the equipment pack and aft bulkhead.
 - (b) Remove the screw and nut that attaches the bonding jumper to the aft bulkhead.
 - (c) Turn the quarter-turn fasteners that attach the aft bulkhead to the drip pan and the cargo pod.
 - NOTE: On airplanes that have the TAS antenna installed, it is necessary to disconnect the coaxial cable and remove the screws and conduit.

- (d) Remove the aft bulkhead from the cargo pod.
- (2) For airplanes with the fairing installation remove the aft fairing. Refer to TKS Anti-Ice System Maintenance Practices (Fairing Installation) Remove the Aft Fairing.
- (3) Remove external electrical power from the airplane.
- (4) Set the BATTERY switch (SC005) on the circuit breaker switch panel, to the OFF position.
- (5) Disengage the circuit breakers on the left circuit breaker panel that follow:
 - PRIMARY ANTI-ICE
 - W/S ANTHCE
 - BACKUP ANTHCE.
- (6) Drain the TKS fluid from the fluid tank as follows:
 - (a) For airplanes with the cargo pod installation TKS Anti-Ice Fluid Tank Components Maintenance Practices (Cargo Pod Installation) TKS Anti-Ice Fluid Removal.
 - (b) For airplanes with the fairing installation refer to TKS Anti-Ice System Maintenance Practices (Fairing Installation) TKS Fluid Removal.
- (7) Put a bucket with a capacity of approximately 3 to 5 gallons below the TKS fluid drain port.
 - NOTE: If necessary, a longer drain tube can be temporarily connected to the drain outlet to prevent fluid spill. The longer drain tube causes the fluid to drain more quickly.
- (8) Disconnect the windshield pump outlet tube from the fuselage connector.
 - (a) Put the open tube end into a bucket with a capacity of approximately 1 gallon.
- (9) Fill the fluid tank with a water and mild detergent mixture.
- (10) Push and turn (lock open) the knurled nut on the drain valve, below the fluid tank, to open the drain port.
- (11) Drain the water and mild detergent mixture from the fluid tank at the drain port.
- (12) Fill the fluid tank with water.
- (13) Drain the water from the fluid tank at the drain port.
- (14) Remove the Fluid Level Sender as follows:
 - (a) For airplanes with the cargo pod installation TKS Anti-Ice Fluid Tank Components Maintenance Practices (Cargo Pod Installation) Fluid Level Sender Removal/Installation.
 - (b) For airplanes with the fairing installation refer to TKS Anti-Ice System Maintenance Practices (Fairing Installation) Fluid Level Sender Removal/Installation.
- (15) Clean the fluid level sender with a water and mild detergent mixture.
- (16) Flush the fluid level sender with water until no contamination shows.
- (17) Install the Fluid Level Sender as follows:
 - (a) For airplanes with the cargo pod installation TKS Anti-Ice Fluid Tank Components Maintenance Practices (Cargo Pod Installation) Fluid Level Sender Removal/Installation.
 - (b) For airplanes with the fairing installation refer to TKS Anti-Ice System Maintenance Practices (Fairing Installation) Fluid Level Sender Removal/Installation.
- (18) Turn and pull (lock closed) the knurled nut on the drain valve to close the drain port.

NOTE: If necessary remove tubing that was added to drain fluid at drain port.

(19) Disconnect the filler inlet tube from the filter inlet manifold assembly.

- (a) Put the inlet tube in a bucket with a capacity of approximately 3 to 5 gallons.
- (20) Add 10 gallons (37.84 liters) of TKS fluid to the fluid tank.
- (21) Supply external electrical power to the airplane.
- (22) Put the EXTERNAL POWER switch (SC006) on the circuit breaker switch panel in the BUS position.
- (23) Engage the circuit breakers on the left circuit breaker panel that follow:
 - PRIMARY ANTHCE
 - W/S ANTHCE

- BACKUP ANTHCE.
- (24) Put the ANTI-ICE-FLUID CONTROL, PRIMARY switch (SI022) on the left switch panel to the HIGH position to start pump 1.
- (25) Put the ANTI-ICE-FLUID CONTROL, MAX FLOW switch (SI023) on the left switch panel to the AIRFRAME position, then release the switch.
 - (a) Let the TKS fluid flow into the bucket at the filter inlet tube for one full cycle of approximately 2 minutes.
- (26) Put the ANTI-ICE-FLUID CONTROL, PRIMARY switch to the OFF position.
- (27) Put the ANTI-ICE-FLUID CONTROL, MAX FLOW switch (SI023) on the left switch panel to the WINDSHIELD position, then release the switch.

NOTE: The windshield pump will start and operate when you put the spring-loaded MAX FLOW switch to the WINDSHIELD position.

- (a) Let the TKS fluid flow into the bucket at the windshield pump outlet tube for one full cycle of approximately 4 seconds.
- (28) Put the EXTERNAL POWER switch on the circuit breaker switch panel in the OFF position.
- (29) Disengage the circuit breakers on the left circuit breaker panel that follow:
 - PRIMARY ANTHCE
 - W/S ANTHCE
 - BACKUP ANTHCE.
- (30) Remove external electrical power from the airplane.
- (31) If the system was operated with fuel contamination in the fluid, do the Remove the TKS Fluid Contamination (Fuel) (TKS System Operated) procedures.

NOTE: If there was fuel contamination in the fluid, but system was not operated, it is not necessary to replace the filter assembly.

- (32) Connect the filter inlet tube with a new O-ring to the filter inlet manifold assembly.
- (33) Connect the windshield pump outlet tube with a new O-ring to the fuselage connector.
- (34) Supply external electrical power to the airplane.
- (35) Put the EXTERNAL POWER switch (SC006) on the circuit breaker switch panel in the BUS position.
- (36) Engage the circuit breakers on the left circuit breaker panel that follow:
 - PRIMARY ANTI-ICE
 - W/S ANTHCE
 - BACKUP ANTHCE.
- (37) Put the ANTI-ICE-FLUID CONTROL, PRIMARY switch (SI022) on the left switch panel to the HIGH position to start pump 1.
- (38) If the filter assembly was replaced, put the ANTI-ICE-FLUID CONTROL, BACKUP switch (SI024) on the left switch panel to the ON position to start pump 2.
 - (a) Let the system operate for approximately 5 minutes until there are no air bubbles in the TKS fluid flow from the porous panels on the wing, wing strut, and horizontal and vertical stabilizer leading edges.

NOTE: If necessary, you can let the system operate for more than 5 minutes until the fluid flow is normal across all porous panels.

- (b) If fluid flow at any of the porous panels does not become normal, do the porous panel purge and test procedure for the applicable porous panel(s). Refer to TKS Leading Edge Porous Panel Adjustment/Test.
- (39) If the filter assembly was not replaced, put the ANTI-ICE-FLUID CONTROL, MAX FLOW switch (SI023) on the left switch panel to the AIRFRAME position, then release the switch.
 - (a) Let the TKS fluid flow from the porous panels on the wing, wing strut, and horizontal and vertical stabilizer leading edges for one full cycle of approximately 2 minutes.
 - NOTE: If necessary, you can do more MAX FLOW cycles until the fluid flow is normal across all porous panels.

- (b) If fluid flow at any of the porous panels does not become normal, do the porous panel purge and test procedure for the applicable porous panel(s). Refer to TKS Leading Edge Porous Panel Adjustment/Test.
- (40) Put the ANTI-ICE-FLUID CONTROL, PRIMARY switch to the OFF position.
- (41) Put the ANTI-ICE-FLUID CONTROL, BACKUP switch to the OFF position.
- (42) Put the ANTHCE-FLUID CONTROL, MAX FLOW switch to the WINDSHIELD position, then release the switch.
 - NOTE: The windshield pump will start and operate when you put the spring-loaded MAX FLOW switch to the WINDSHIELD position.
 - (a) Do three full cycles of approximately 4 seconds each to let the TKS fluid flow from the windshield spray bar. NOTE: If necessary, you can do more cycles until the fluid flow is normal from the spray bar.
- (43) Return the TKS system to service. Refer to TKS Return to Service.
- B. Remove the TKS Fluid Contamination (Fuel) (TKS System Operated).
 - (1) Do the Remove the TKS Fluid Contamination (Fuel) (TKS System Not Operated) procedures.
 - (2) Replace the filter pack as follows:
 - (a) For airplanes with the cargo pod installation TKS Anti-Ice Fluid Tank Components Maintenance Practices (Cargo Pod Installation) Filter Pack Removal/Installation.
 - (b) For airplanes with the fairing installation refer to TKS Anti-Ice System Maintenance Practices (Fairing Installation) Filter Assembly Removal/Installation.
 - (3) Do the TKS Proportional Unit Adjustment/Test procedures.
 - (4) Do the porous panel purge. Purge the individual panels and the TKS tubing. Refer to TKS Leading Edge Porous Panel Adjustment/Test.
 - (5) Return the TKS system to service. Refer to TKS Return to Service.
- C. TKS Return to Service.
 - (1) Put the EXTERNAL POWER switch on the circuit breaker switch panel in the OFF position.
 - (2) Remove external electrical power from the airplane.
 - (3) Make sure that the fluid tank servicing is correct. Refer to Chapter 12, TKS Anti-Ice System Servicing.
 - (4) Make sure that the floor and the airplane surfaces are clean.
 - (5) For airplanes with the cargo pod installation do the steps that follow:
 - (a) Put the aft bulkhead in position in the cargo pod.
 - (b) To install the drip pan use Type I, Class B sealant to bond the forward edge of the drip pan to the cargo pod.
 - (c) Turn the quarter-turn fasteners that attach the aft bulkhead to the drip pan and the cargo pod.
 - (d) Install the screw and nut that attaches the bonding jumper to the bulkhead.
 - <u>1</u> Make sure that there is a good electrical bond. Refer to Chapter 20, Electrical Bonding Maintenance Practices.
 - (e) Install the screws and connect the antenna coaxial cable and conduit, if applicable.
 - (f) Close the cargo pod doors.
 - (6) If applicable, install the aft fairing. Refer to TKS Anti-Ice System Maintenance Practices (Fairing Installation) Remove the Aft Fairing.

4. TKS Fluid Contamination (Water) Removal

- WARNING: For health and environmental data, refer to the applicable Material Safety Data Sheet (MSDS).
- WARNING: If TKS fluid is spilled, immediately remove (clean) or contain all the TKS fluid. TKS fluid on the floor causes a dangerous condition.
- WARNING: Before you operate the TKS system, put plastic sheets or absorbent cloths below the porous panels. This keeps the TKS fluid off the floor which helps prevent injury to personnel.
- WARNING: TKS fluid is a hazardous material. You must discard all unwanted TKS fluid and/or dirty cloths. Refer to approved procedures.
- CAUTION: Use only approved TKS fluids. Approved fluids, in accordance with specification DTD 406B, are usually

80% to 85% mono-ethylene glycol, 5% isopropyl alcohol, and 10% to 20% de-ionized water. Fluid density is approximately 9.2 pounds for each gallon.

- CAUTION: Use only clean, filtered fluid in the TKS system. Contamination will cause fluid blockage and/or damage to the porous panel.
- A. Suspected Water Contamination Procedures
 - (1) Move the airplane in a hanger wit an ambient temperature of a minimum of 50 F (10 C).
 - (2) When the airplane is at the ambient temperature do the TKS preflight procedures. Refer to the Model 208 POH.
 - (a) If the airplane passes the preflight procedures the TKS system is clear of water contamination caused by condensation and airplane can return to service.
 - (b) If the airplane does not pass the preflight procedures at 32 ♦ F (0 ♦ C) or below but passes the preflight procedures at 50 ♦ F (10 ♦ C) do the the water contamination removal procedures. Refer to Remove the TKS Fluid Contamination (Water).
 - (c) If the airplane does not pass the TKS preflight procedures at any temperature suspect fuel contamination. Refer to TKS Fluid Contamination (Fuel) Removal.
- B. Remove the TKS Fluid Contamination (Water).
 - (1) Remove external electrical power from the airplane.
 - (2) Set the BATTERY switch (SC005) on the circuit breaker switch panel, to the OFF position.
 - (3) Drain the TKS fluid from the fluid tank as follows:
 - (a) For airplanes with the cargo pod installation TKS Anti-Ice Fluid Tank Components Maintenance Practices (Cargo Pod Installation) TKS Anti-Ice Fluid Removal.
 - (b) For airplanes with the fairing installation refer to TKS Anti-Ice System Maintenance Practices (Fairing Installation) TKS Fluid Removal.
 - (4) Do the fluid tank servicing. Refer to Chapter 12, TKS Anti-Ice System Servicing.
 - (5) Supply external electrical power to the airplane.
 - (6) Put the EXTERNAL POWER switch (SC006) on the circuit breaker switch panel in the BUS position.
 - (7) Engage the circuit breakers on the left circuit breaker panel that follow:
 - PRIMARY ANTI-ICE
 - W/S ANTHCE
 - BACKUP ANTHCE.
 - (8) Do the porous panel purge. Refer to TKS Leading Edge Porous Panel Adjustment/Test.
 - (a) To flush the filter pack, operate the TKS system in the HIGH mode for a complete cycle.
 - (b) If fluid flow at any of the porous panels is not normal, do a test of the individual panel.
 - (9) When the system is serviceable, operate the TKS system in the BACKUP mode for four minutes.
 - (10) Put the ANTI-ICE-FLUID CONTROL, PRIMARY switch to the OFF position.
 - (11) Put the EXTERNAL POWER switch on the circuit breaker switch panel in the OFF position.
 - (12) Remove external electrical power from the airplane.
 - (13) Make sure that the fluid tank servicing is correct. Refer to Chapter 12, TKS Anti-Ice System Servicing.
 - (14) Make sure that the floor and the airplane surfaces are clean.

5. TKS Fluid Contamination (Solids) Removal

- A. TKS Fluid Contamination (Solids) Removal
 - (1) If the TKS fluid contamination is a solid material, contact Cessna Customer Service, P.O. Box 7706, Wichita, Kansas 67209 USA Tele: 316-517-5800 Fax: 316-517-7271.