TKS PROPELLER FLOW AND TEST PORT PRESSURE - ADJUSTMENT/TEST

1. General

A. This section contains the procedures to do a test of the propeller fluid flow. and system port pressure. The procedures apply to the cargo pod and the fairing TKS system installation.

2. Tools and Equipment

- A. For a list of tools and equipment, refer to Ice and Rain Protection General.
 - NOTE: It is necessary that you have access to clean dry cloths, 30 gallons of approved TKS fluid, a TKS system test cart with connection hardware, 75 psi (517 kPa) filtered shop air (to use with a test cart), and a container with a capacity of three to five gallons.
 - NOTE: You can fabricate a fluid collector system, which will contain the fluid and keep it off the floor. Recommended materials you can use are plastic sheets, tubing, aluminum tape, and rigid aluminum and/or plastic gutter material.
 - NOTE: For the torque values for aluminum alloy and stainless steel fittings on nylon tubing refer to TKS Anti-Ice Fluid Distribution System - Maintenance Practices Nylon Tubing Repair/Replacement.

B. Pressure Gage Assembly

NOTE: Equivalent substitutes may be used for the following listed items.

- (1) Use the materials that follow to assemble the pressure gage with a nylon hose:
 - 5/16 Nylon Tubing (TKS) part number H610025 (approximately 3 ft)
 - Nut ZN4855
 - Sleeve ZN101-20
 - Sealing Ring S2800-942.
- C. Special Tools
 - (1) Graduated Beaker (500 ml).
 - (2) Non-contact Thermometer.

3. Propeller Flow and Port Pressure Test

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

- 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.
- 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: 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 501. 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: 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.
- A. Test Preliminary Procedures (Refer to Figure 501 or Figure 502) as applicable.

- (1) Remove external electrical power from the airplane.
- (2) Disengage the circuit breakers on the left circuit breaker panel that follow:
 - PRIMARY ANTI-ICE
 - W/S ANTHCE
 - BACKUP ANTHCE.
- (3) Make sure that the switches that follow are in the OFF position:
 - External Power (Bus) Switch (SC006)
 - Battery (DC Power) Switch (SC005)
 - Fluid Control Primary (Sl022)
 - Fluid Control Backup (Sl024)
 - Avionics Bus 1 (SC016)
 - Avionics Bus 2 (SC018).
- (4) To get access to the test port on the TKS fairing installation you must remove the aft fairing section. Refer to TKS Anti-Ice System Maintenance Practices (Fairing Installation) Remove the Aft Fairing.
- (5) To get access to the test port on the TKS cargo pod installation you must open the forward middle cargo pod door.
- (6) Attach the fluid collector system below the porous panels for the purge procedure.
- (7) Assemble the nylon tubing with the pressure gage on one end and the nut, sleeve and sealing ring on the other end.
- (8) Remove the 5/16 inch blanking cap from the test port.
 - (a) Install the nylon tubing with pressure gage to the test port.
- (9) Put the 500 ml beaker below the propeller.
 - NOTE: A piece of 1/8 inch flexible plastic tubing can be used to collect the fluid from the TKS propeller feed nozzle to the graduated flask.
- B. Do the Propeller Flow And Port Pressure Test (Refer to Table 501 and Table 502).

NOTE: The propeller flow and system pressure test procedures for airplanes with the cargo pod installation and with the fairing installation are identical.

Table 501. Propeller Fluid Flow

Fluid Temperature	Fluid Flow Maximum (ml/min)
86.00F� (30.00C�)	143.00
77.00F� (25.00C�)	137.00
68.00F� (20.00C�)	131.00
59.00F� (15.00C�)	124.00
50.00F� (10.00C�)	121.00
41.00F� (5.00C�)	119.00
32.00F� (0.00C�)	117.00

Table 502. Test Port Pressure

Fluid Temperature	Test Port Pressure Maximum (psi)
86.00F� (30.00C�)	7.00
77.00F� (25.00C�)	8.00
68.00F� (20.00C�)	10.00
59.00F� (15.00C�)	13.00
50.00F� (10.00C�)	15.00
41.00F� (5.00C�)	16.00
32.00F� (0.00C�)	18.00

(1) Supply external electrical power to the airplane.

- (2) Set the EXTERNAL POWER switch (SC006) on the pilot's switch panel in the BUS position.
- (3) Set the AVIONICS 1 switch (SC016) to the ON position.
- (4) Set the AVIONICS 2 switch (SC018) to the ON position.
- (5) Engage the circuit breakers on the left circuit breaker panel that follow:
 - PRIMARY ANTI-ICE
 - W/S ANTHCE
 - BACKUP ANTHCE.
- (6) Before you continue with the test make sure that you have the conditions that follow:
 - (a) Make sure that the TKS components are installed and all tubing connection installed.
 - (b) Make sure that the tank fluid temperature is above 32 (0).
- (7) Set the ANTI-ICE-FLUID CONTROL, PRIMARY switch (SI022) on the left switch panel in the HIGH position.
- (8) Read the pressure indicated on the pressure gage at the test port at 60 second intervals until 3 consecutive readings are the same record the indications that follow:
 - (a) The tank fluid temperature.
 - (b) The fluid pressure that shows on the gage at the test port. Refer to Table 502.
 - (c) After 3 pressure readings that were the same, in the next 60 seconds read the amount (ml) of fluid collected at the propeller beaker.
- (9) If the test port gage shows more than 25 psi (172 kPa) after 2 minutes do the porous panel purge. Refer to TKS Antilce Leading Edge Porous Panel - Adjustment/Test.
 - (a) When the porous panel purge is complete do the pressure test again.
- (10) Remove the digital pressure gage tube assembly from the test port.
- (11) Install the 5/16 cap on the unequal tee.
- (12) If necessary install the aft fairing section. Refer to TKS Anti-Ice System Maintenance Practices (Fairing Installation) Install the Aft Fairing.













Figure 501 : Sheet 2 : TKS Nylon Tubing Assembly