ELEVATOR SYSTEM - INSPECTION/CHECK

1. General

A. This section has the inspections and checks necessary to keep the elevator system in a serviceable condition.

TASK 27-30-00-290

2. Left and Right Elevator Torque Tube Attach Points (Borescope) Special Detailed Inspection

A. General

(1) This task gives the procedures to the special detailed inspection (borescope) of the elevator torque tube attach points.

B. Special Tools

(1) Borescope

C. Access

(1) Remove tailcone access panel 320A to get access to the elevator control system. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.

(2) Get access to the Left and Right Stabilizer Station 55.00 areas. Refer to Chapter 6, Airplane Stations- Description and Operation.

D. Do the Left and Right Elevator Torque Tube Attach Points (Borescope) Special Detailed Inspection

WARNING: Make sure area is clear of personnel before moving flight controls.

(1) Access the Center Hinge Point on the Right Elevator.

(2) Examine the torque tube for free play, do the following:

(a) Position the left elevator at the full down stop position.

(b) Tightly hold the right elevator and make sure there is NO up and down free play.

NOTE: Free play could indicate slotted holes and/or loose rivets.

(c) Position the right elevator at the full down stop position.

(d) Tightly hold the left elevator and make sure there is NO up and down free play.

NOTE: Free play could indicate slotted holes and/or loose rivets.

(e) If free play is found, make note of area and continue examination of the elevator torque tube attach points.

(3) Identify the tooling bore located directly in line with the attach bolt at Stabilizer Station 55.00, refer to Figure 601, Sheet 1, Sheet 2 and Sheet 3.

NOTE: It is permissible to enlarge to the tooling bore to a maximum size of 0.25 inches (6.35mm) for borescope use.

(4) Insert borescope into the tooling bore and feed it down the leading edge to the outboard torque tube attach rib located at Stabilizer Station 22.00, refer to Figure 601 Sheet 2.

(a) Examine the outboard torque tube attachment end cap fasteners for looseness or fretting indications. Refer to Figure 601 Sheet 3 Detail A-A.

(b) If loose or fretting rivets were noted during the free play check, and/or loose or fretting rivets are found during borescope examination, replace fasteners. Refer to the Model 208 Structural Repair Manual, Chapter 51, Fasteners.

(5) Examine the inboard torque tube attachment fasteners for looseness or fretting indications. Refer to Figure 601 Sheet 3 Detail B-B.

NOTE: Use of the borescope is not necessary to examine the inboard attach points. Access is suitable through tailcone access panel 320A.

(a) If loose or fretting rivets were noted during the free play check, and/or loose or fretting rivets are found during examination, replace fasteners. Refer to the Model 208 Structural Repair Manual, Chapter 51, Fasteners.

(6) Repeat the above inspection steps for the Left Elevator Torque Tube Attach Points.

E. Post Maintenance Free Play Check

(1) If any fasteners (rivets) were changed, do the free play check as follows:

(a) Position the left elevator at the full down stop position.

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(b) Tightly hold the right elevator and make sure there is NO up and down free play.

(c) Position the right elevator at the full down stop position.

(d) Tightly hold the left elevator and make sure there is NO up and down free play.

(e) If free play is still present repeat the inboard and outboard elevator torque tube attach points inspection until the loose fasteners have been identified and replaced.

F. Restore Access

(1) Install tailcone access panel 320A to get access to the elevator control system. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.

END OF TASK

TASK 27-30-00-720

3. Elevator System Functional Check

A. General

(1) This task gives the procedures to do a functional check of the elevator system.

B. Special Tools

(1) Inclinometer

(2) Cable Tensiometer

(3) Elevator Neutral Rigging Tool

(4) Elevator Rigging Protractor

(5) Spring Scale (0 to 20 Pounds)

(6) External Electrical Power Unit

C. Access

(1) Remove the applicable floor panels to get access to the elevator control system. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.

(2) Remove vertical stabilizer panel 320A to get access to the elevator control system. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.

(3) If installed, remove the liquid barrier. Refer to Chapter 53, Plates/Skins - Maintenance Practices.

D. Do a Functional Check of the Elevator System (Refer to Figure 602 and Figure 603).

(1) Do a check of the cable movement for binding and full travel.

(2) Examine the elevator skins for cracks and loose rivets.

(3) Examine the elevator hinges, hinge bolts, hinge bearings, torque tube, horn, attach fittings, and bonding jumper for corrosion, cracks, signs of damage, wear, unserviceable fasteners, security, and correct safeftying.

(4) Examine the balance weights and the support structure for corrosion, looseness, cracks, and damage.

(5) Examine the outboard tips for cracks in the rib flange.

(6) Examine the elevator bell cranks, bearings, push rods, stop bolts, and brackets, for corrosion, cracks, signs of damage, failed fasteners, security of installation, correct installation of cable attaching hardware, and correct safetying.

(7) Examine the turnbuckles for correct thread exposure.

(a) Make sure that the turnbuckle locking clips are installed correctly. Refer to Chapter 20, Safetying - Maintenance Practices.

(8) Examine the swage fittings reference marks for an indication of cable slippage inside of the fitting.

(a) Examine the fittings for corrosion, distortion, cracks, and broken wires at the fittings.

(9) Examine the pulleys, attach brackets, and guard pins for condition, wear, corrosion, and security.

(a) You must turn the pulleys to make sure there freedom of movement and to make sure there is even wear of the pulleys.

(b) If discrepancies are found with the brackets, examine the structure where the brackets are attached for hidden damage.

(10) Examine the control column for corrosion, signs of damage, unserviceable fasteners, and security of installation.

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(11) Examine the column lock for correct operation.

(12) Examine all welds in the column tube and the torque tube for corrosion and cracks.

(13) Examine both torque tube support arms for corrosion, condition, and security of the attach bearings.

(14) Examine the support arm attach structure for condition, cracks, and correct safety of the attach bolts.

(15) Examine the cable guards for corrosion, condition, and security on both column quadrants.

(16) Examine for sufficient clearance of all components and structure at the full aft and full forward positions.

E. Examine the Cable Travel and Tensions (Refer to Figure 602).

(1) Use the cable tensiometer to measure the elevator cable tension.

(a) Make sure that the cable tension is 60 pounds, +5 or -5 pounds (267 N, +22 or -22 N) at 70°F (21°C).

(2) Set the control wheels to put the elevators in the neutral position.

(3) Make sure that the left elevator is at the streamlined position

(4) Attach an inclinometer on the left elevator's trailing edge and set it to zero degrees.

CAUTION: Do not attempt to align the horn (balance weight portion) on the elevator to the stabilizer.

CAUTION: Make sure that the support stand is under the tail to prevent the tail cone from dropping while working in the tail cone.

(5) Examine the cable tensions and adjust if necessary.

(a) For the elevator control cables, refer to Elevator - Maintenance Practices.

(b) For the elevator trim cables, refer to Elevator Trim System - Maintenance Practices.

(c) For airplanes equipped with 400B and 400B IFCS autopilot type AF-550A and IF-550A, refer to Elevator - Adjustment/Test.

(6) Operate the system through its full range of travel.

(a) Make sure that all of the components that move do not hit, touch, or catch on structural components or other system components.

(7) Move the elevator to contact the down stop bolt.

(a) Make sure that the inclinometer shows 20 +2 or -2 degrees.

(8) Move the elevator to contact the up stop bolt.

(9) With the rigging protractor, make sure that the elevator UP Stop is set as follows:

Table 601. Model 208 UP Stop Limits

Model	TKS Anti-ice System	Elevator Up Stop Setting	Plus Tolerance	Minus Tolerance
208	Not Installed	25°	+2°	-2°
	Installed	18°	+1°	-1°

NOTE: If necessary, adjust the UP Stop bolt.

Table 602. Model 208B UP Stop Limits

Model	TKS Anti-ice System	Elevator Up Stop Setting	Plus Tolerance	Minus Tolerance
Airplanes 208B0001 thru 208B2196 Airplanes 208B2198 thru 208B4999	Without TKS Anti-ice Without Cargo Pod	25°	+2°	-2°
	Without TKS Anti-ice With Cargo Pod			
	With TKS Anti-ice With Cargo Pod			
	With TKS Anti-ice With Fairing	22°	+1°	-0°

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Airplane 208B2197 Airplanes 208B5000 and On	Without TKS Anti-ice Without Cargo Pod	24°	+0°	-1°
	Without TKS Anti-ice With Cargo Pod			
	With TKS Anti-ice With Cargo Pod			
	With TKS Anti-ice With Fairing	22°	+1°	-0°

NOTE: If necessary, adjust the UP Stop bolt.

(10) Remove the inclinometer from the left elevator trailing edge.

(11) Do an electric elevator trim clutch torque system check, (Refer to Electric Elevator Trim - Adjustment/Test).

F. Do an Electric Elevator Trim Operational Check

(1) Connect external electrical power to the airplane.

(2) Set the External Power Switch to BUS.

(3) Set the Battery switch to ON.

(4) Do a check to make sure that the left and the right elevator trim switch halves operate correctly.

(a) Move the right switch half forward to the DN position momentarily, then release it to the center position.

1 Make sure that the elevator trim wheel does not move.

(b) Move the right switch half aft to the UP position momentarily, then release it to the center position.

1 Make sure that the elevator trim wheel does not move.

(c) Move the left switch half forward to the DN position momentarily, then release it to the center position.

1 Make sure that the elevator trim wheel does not move.

(d) Move the left switch half aft to the UP position momentarily, then release it to the center position.

1 Make sure that the elevator trim wheel does not move.

(e) Move and hold the left and the right switch halves forward to the DN position and do the following before the elevators reach the full down position.

1 Make sure that the elevator travel direction is correct.

2 Push and release the A/P Trim Disconnect push button.

a Make sure that the trim wheel moved in proper direction and that it stopped movement when the A/P Trim Disconnect push button is pushed and held.

(f) Move and hold the left and the right switch halves aft to the UP position and do the following before the elevators reach the full up position.

1 Make sure that the elevator travel direction is correct.

2 Push and release the A/P Trim Disconnect push button.

a Make sure that the trim wheel moved in proper direction and that it stopped movement when the A/P Trim Disconnect push button is pushed and held.

(g) Release the left and the right switch halves to the center OFF position.

(h) Operate the system through the full range of travel and examine for binding, jerking movements, and sluggish operation.

(i) Examine the operating time for the full range of motion.

1 Airplanes equipped with King KFC-150 or -250 autopilot must complete the full range of travel from 26 to 38 seconds.

2 Airplanes equipped with King KFC-225 autopilot must complete the full range of travel from 16 to 24 seconds.

(5) Set the Battery switch to OFF.

(6) Set the External Power Switch to OFF.

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(7) Disconnect the external electrical power unit from the airplane.

G. Restore Access

(1) If installed, install the liquid barrier. Refer to Chapter 53, Plates/Skins - Maintenance Practices.

(2) Install vertical stabilizer panel 320A. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.

(3) Install the applicable floor panels that were removed to get access to the elevator control system. Refer to Chapter 6, Access Plates and Panels Identification - Description and Operation.

END OF TASK

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Figure 601 : Sheet 1 :

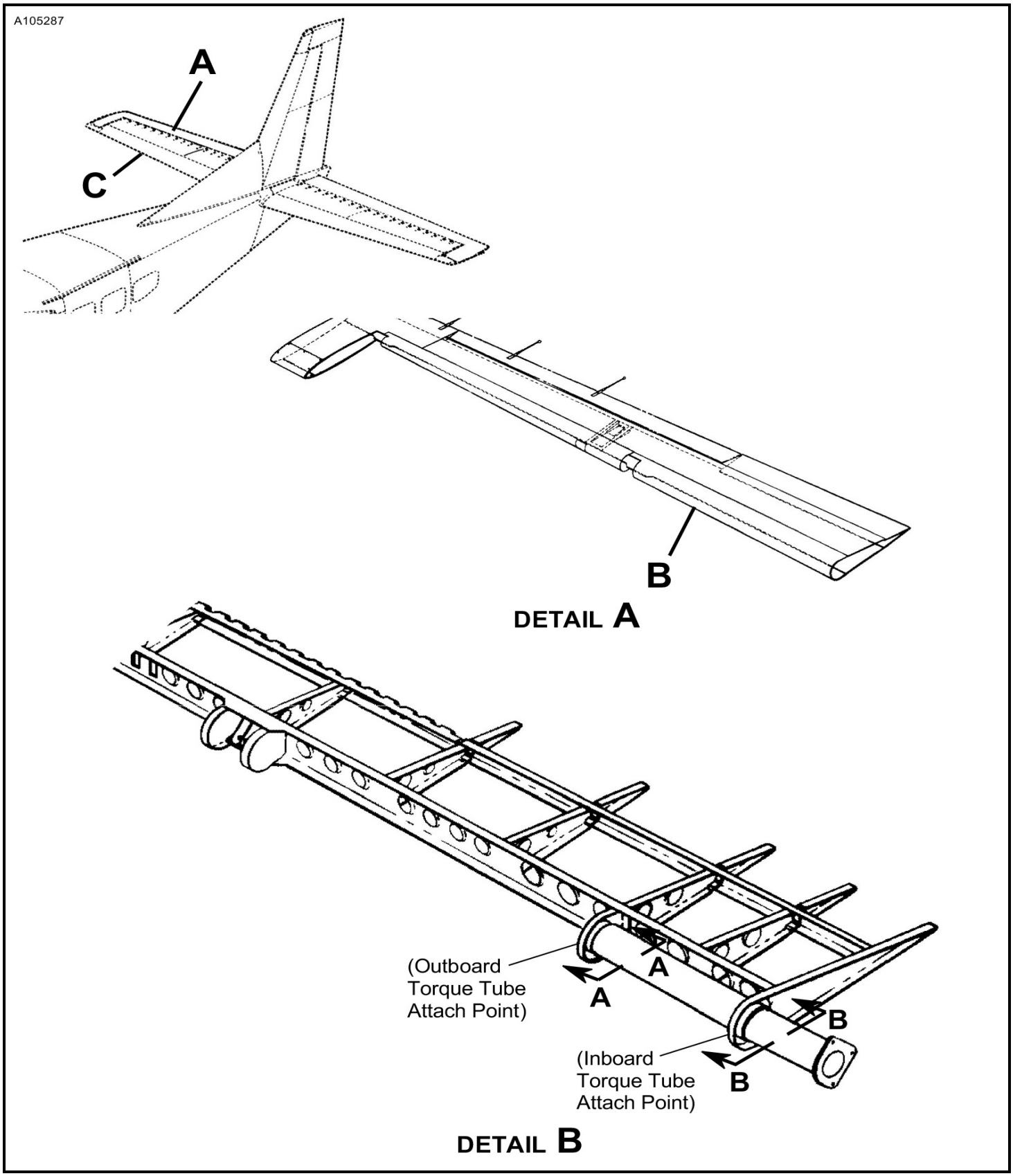

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Figure 601 : Sheet 2 :

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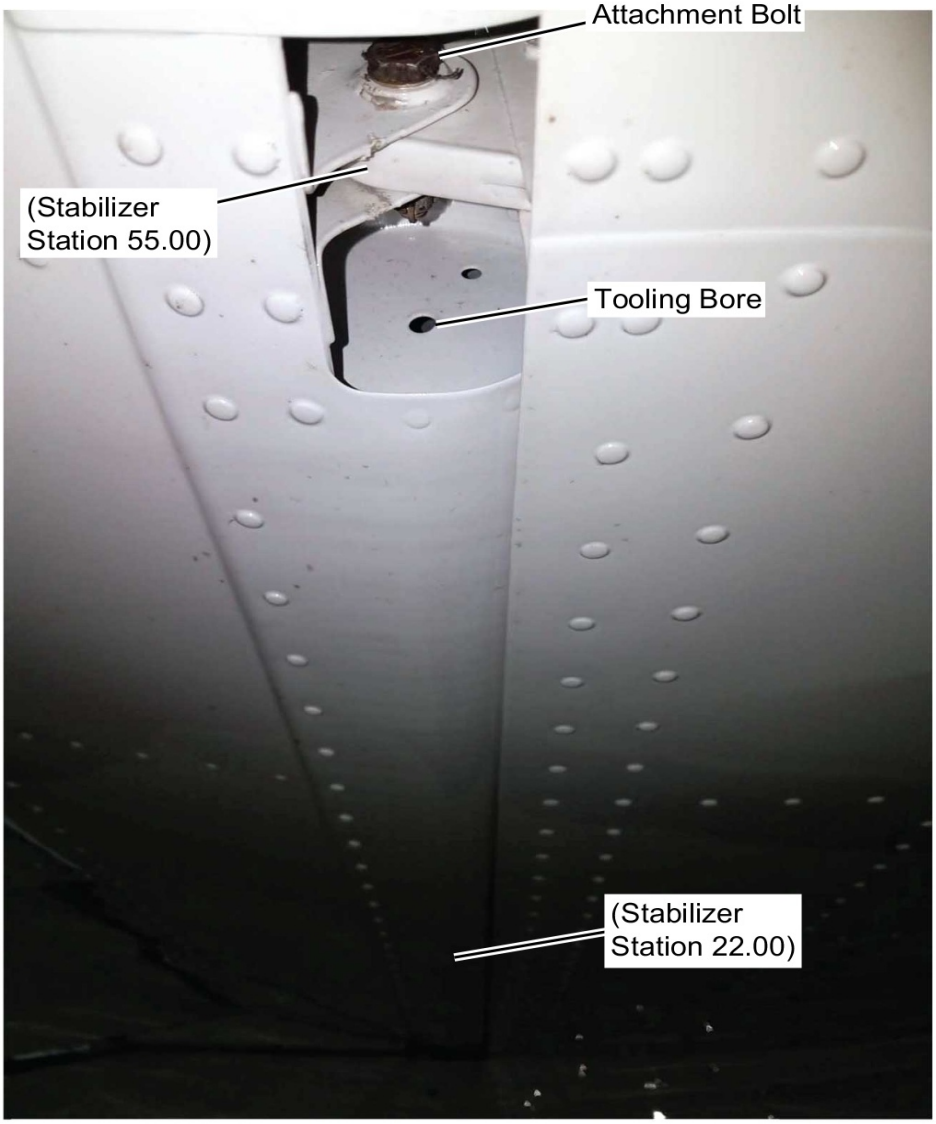

DETAIL C

Right Hand Elevator Shown, Left Hand Typical

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Figure 601 : Sheet 3 :

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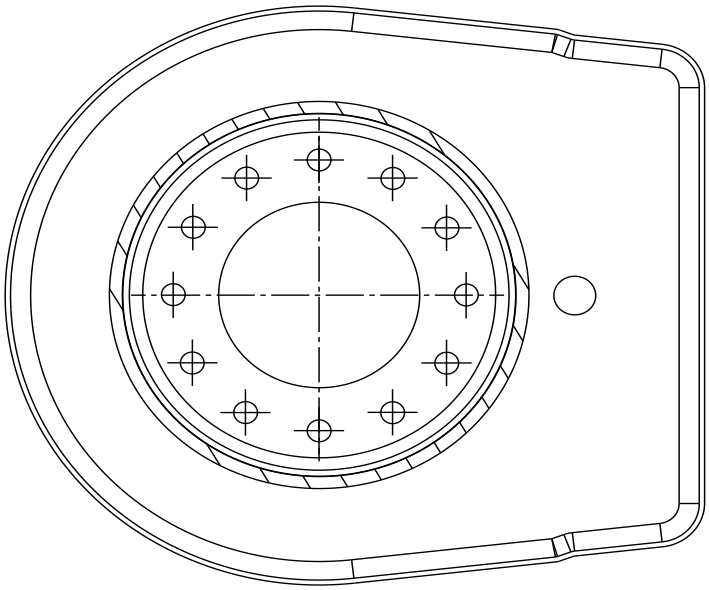
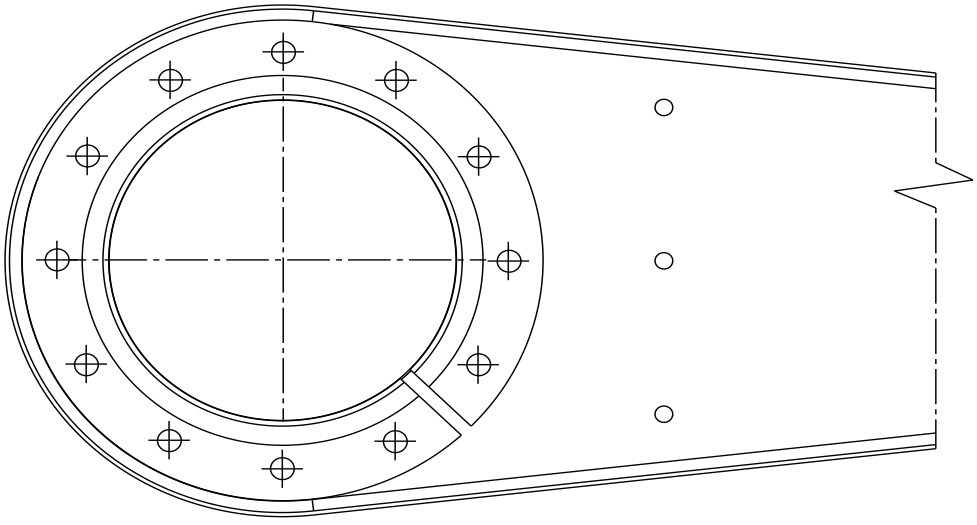


VIEW A-A
(Outboard Torque Tube Attach Point)



VIEW B-B
(Inboard Torque Tube Attach Point)

2634000

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Figure 602 : Sheet 1 : Temperature Effect on Cable Tension - 208/208B Pitch Servo Cables (1/16" 7*7 CRES)

A104635

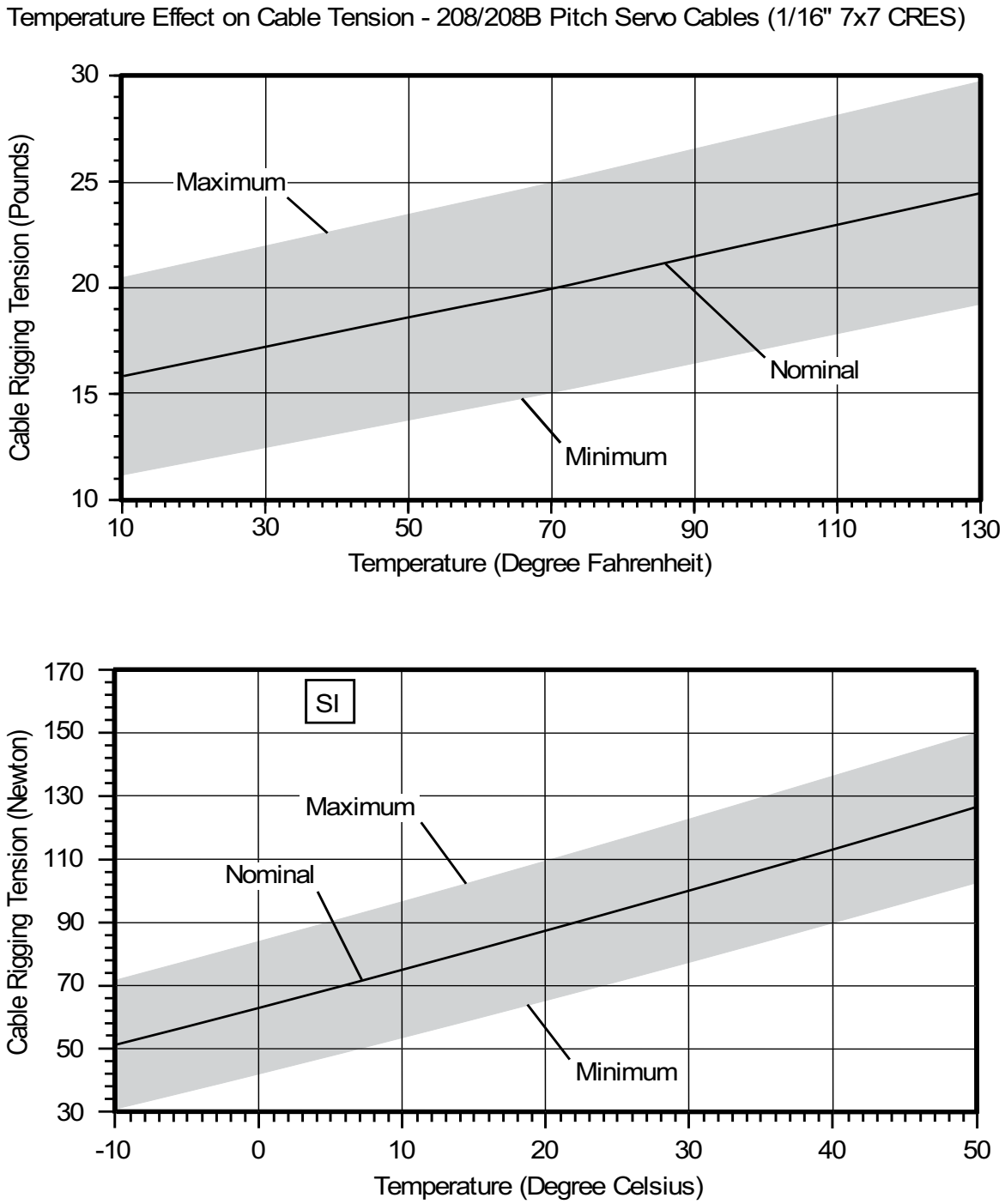

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Figure 603 : Sheet 1 : Temperature Effect on Cable Tension - 208/208B Elevator Cables (1/8" 7*19 CRES)

A104734

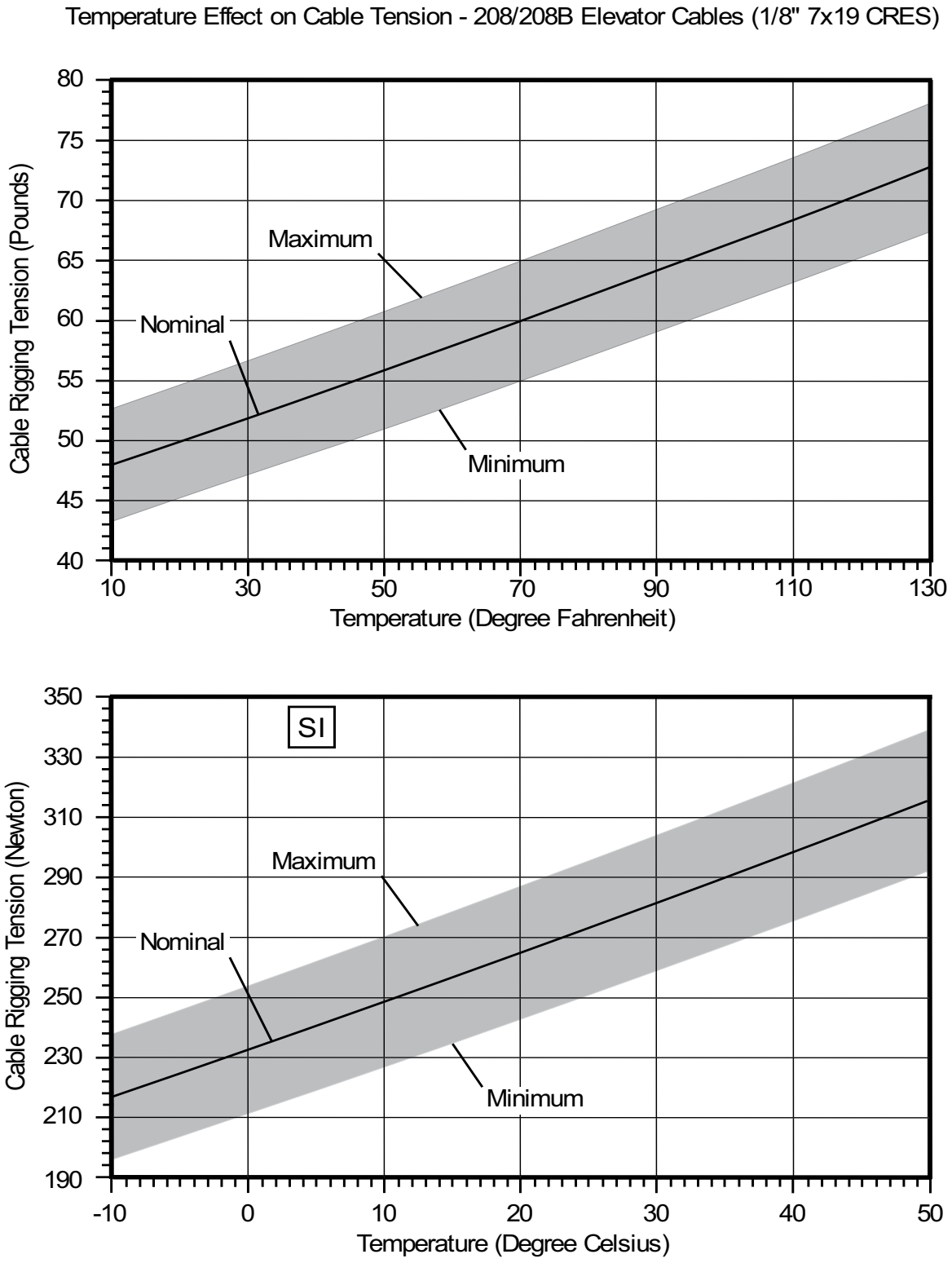

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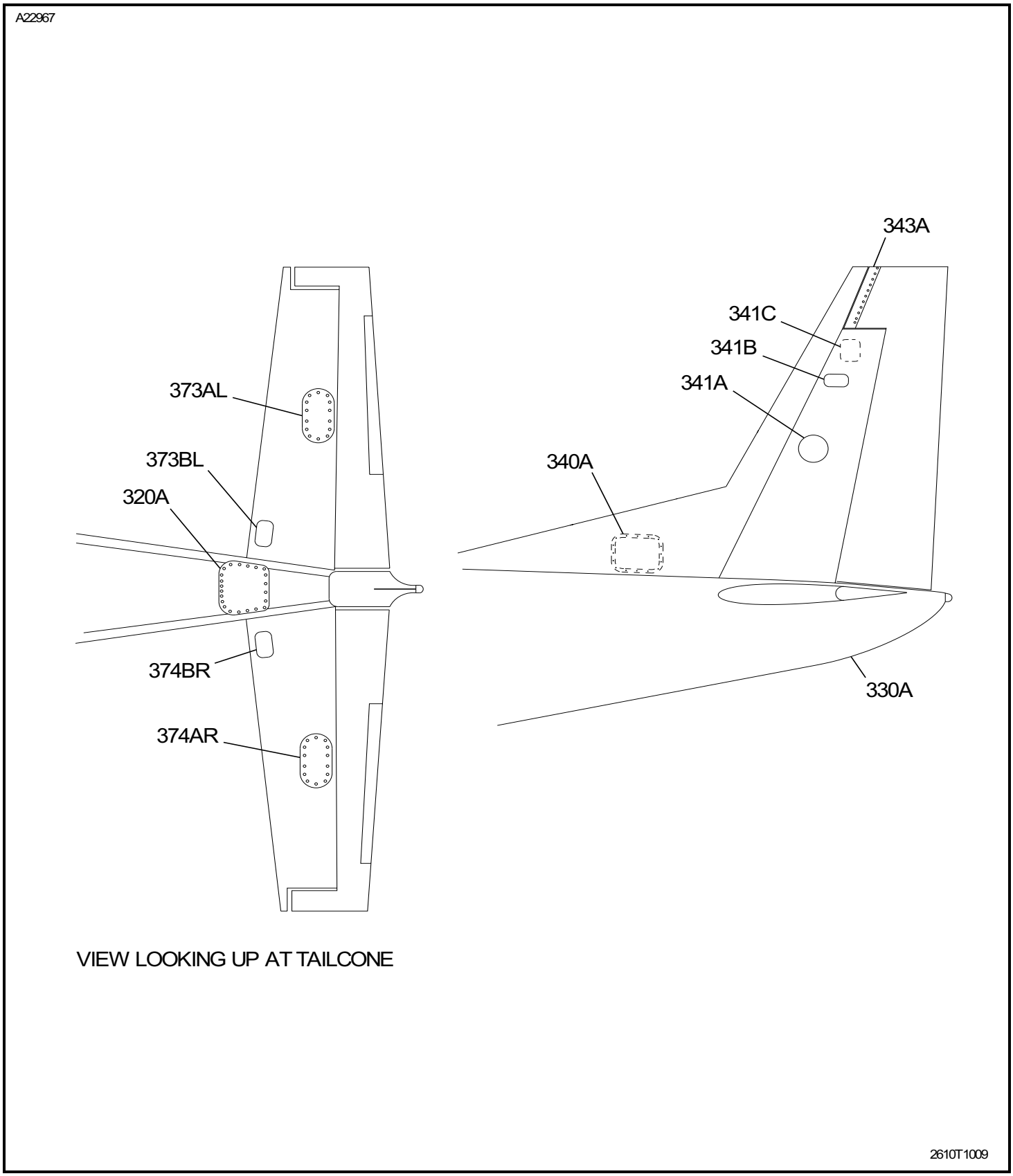
Figure 9 : Sheet 1 : Aft Fuselage, Horizontal and Vertical Stabilizer Panels



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