

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL

ELEVATOR, ELEVATOR TRIM TAB AND CONTROL SYSTEM

Description

1. The elevator system, which is mechanically operated, provides longitudinal control of the aircraft. The elevator trim system is operated mechanically and/or electrically.
2. The elevator control system consists of: Two elevator assemblies, control column quadrant, bellcrank, elevator arm and a torque tube installed in each elevator. Each elevator is attached to the rear spar of the horizontal stabilizer at two hinge points. Each elevator is 100 percent static balanced with the elevator trim tab and elevator arm attached, at the time of installation. The elevators are operated by the fore and aft movement of the control column. The control column quadrant assembly is attached to the control column by links which are attached to a swivel bearing on the control column. The elevator cable assemblies and adjustable turnbuckles are attached to the quadrant and then routed down under the floor, through the fuselage pulleys to the elevator bellcrank in the tailcone. A push-pull tube connects the bellcrank to the elevator arm, which is attached to the elevator torque tubes. Elevator travel stops, which consists of bolts mounted in a bracket just aft of the bellcrank, provide the recommended travel adjustment of the elevators. Elevator bobweights are attached to the quadrant assembly torque tube, one on each side. The bobweights are utilized to stabilize the aircraft in flight. An elevator down spring is attached to the bellcrank to provide for better elevator balance during flight.
3. The elevator trim tab is operated by a control wheel mounted on the left side of the pedestal. The control wheel is attached to a sprocket which drives a chain and cables. The chain and cables are routed to pulleys forward and down through the pedestal under the floor and aft to the tailcone of the aircraft. In the tailcone, the cables are routed aft just forward of the horizontal rear spar, then up and through the right horizontal stabilizer to a chain which operates the trim tab actuator. The trim tab push-pull tube connects the trim tab actuator to the elevator trim tab, mounted to the right elevator by a continuous hinge. Adjustable turnbuckles are located, in the forward inspection panel for cable tension adjustment. Stop blocks are located, in the tailcone for adjustment of the elevator trim tab travel.
4. The electric elevator trim control system (optional without autopilot or IFCS) consists of: Electric trim disengage switch, electric trim control switch, and an electric actuator assembly mounted in the tailcone at approximately Fuselage Station 300.00; a control cable attached to the left forward elevator trim control cable and routed around the actuator clutch assembly drum then aft connecting to the elevator trim actuator chain; and associated electrical wiring. The system is energized, when the electric trim disengage switch on the left hand control wheel is positioned to ENGAGE and the electric trim control switch (slider switch) on the left hand control wheel is positioned forward (DOWN) or aft (UP) position. The actuator motor drives the clutch assembly, which moves the elevator trim control cables and places the elevator trim tab in the corresponding UP or DOWN position. Manual override of the system can be accomplished by operating the elevator trim control wheel, mounted on the left side of the pedestal.

CAUTION : **PRIMARY AND SECONDARY FLIGHT CONTROL CABLES, PUSH-PULL TUBES, BELLCRANKS AND MOUNTINGS USE DUAL LOCKING FASTENERS. THE LOCK NUTS FOR THESE FASTENERS INCORPORATE A FIBER LOCK, AND ARE CASTELLATED FOR SAFETYING WITH A COTTER PIN. WHEN ANY OF THESE AREAS ARE DISCONNECTED, NEW DUAL LOCKING FASTENERS SHOULD BE INSTALLED. SEE THE AIRCRAFT PARTS CATALOG FOR PART NUMBERS AND LOCATION OF THESE FASTENERS.**

Troubleshooting

1. Troubleshooting the elevator and tab system is to determine if the trouble exists in the elevator control system or in the elevator trim control system. Remove the control column lock when troubleshooting. See Figures 1, 2 and 3 for Troubleshooting Chart.

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL

2. Tools and Equipment.

NOTE : EQUIVALENT SUBSTITUTES MAY BE USED INSTEAD OF THE FOLLOWING LISTED ITEMS.

Name	Number	Manufacturer	Use
Inclinometer KELL-STROM "PRO 360"	518831	KELL-STROM TOOL INC 214 Church Street Wethersfield, CT SA 06109	To measure travel of control surfaces.
Tensiometer	T5-2002-0101	Pacific Scientific Co. Kin-Tech Division 1346 S. State College Blvd. Los Angeles, CA 92803	To measure cable tension.

Adjustment/Test

1. Tools and Equipment.

NOTE : REFER TO TROUBLESHOOTING FOR TOOLS AND EQUIPMENT.

2. Rigging Elevator Control System (Refer to Figure 6)

- A. Remove access cover from pedestal, tailcone access and necessary fairings to gain access to the bellcrank push-pull tube (29).
- B. Place a suitable support under the tailcone.
- C. Disconnect the bellcrank push-pull tube (29) from the elevator arm (25) by removing cotter pin (28), nut (27), washer (26) and bolt (24).

CAUTION : DO NOT OPERATE ELEVATOR FROM THE TIPS, DAMAGE COULD RESULT.

- D. Install temporary external control locks between elevator horns and the horizontal stabilizer.
- E. Fabricate and install a control column holding tool (refer to Figure 4) to secure the control column in neutral position. To install tool remove Royalite cover on control column.
- F. Disconnect elevator down spring (40).
- G. Adjust the elevator control cables until the bellcrank (44) is vertical (cable attachment holes equal distance from the bulkhead and cable tension on cables aft of turnbuckles is in accordance with Chapter 1-00. Connect elevator down spring (40).

NOTE : CABLE TENSION SHOULD BE MEASURED AFT OF 255.00 IN TAILCONE.
CABLE TENSION SHOULD BE ADJUSTED WHEN AMBIENT
TEMPERATURE IS 65°F TO 95°F. ALLOW AIRPLANE TEMPERATURE TO
STABILIZE FOR A PERIOD OF FOUR HOURS.

- H. Zero position of the elevator is with the centerline of the elevator horn aligned with the centerline of the horizontal stabilizer.
- I. Zero position of the elevator trim tab is with the inboard end of the trim tab matching the trailing edge of the horizontal stabilizer. In this position the right (outboard) end of the trim tab must align with the inboard end of the right elevator with 0.15 inch.

NOTE : WITH ELEVATORS IN ZERO POSITION, THE INBOARD TRAILING EDGES
MAY NOT ALIGN WITH HORIZONTAL STABILIZER TRAILING EDGE.

- J. Adjust bellcrank push-pull tube (29) length to obtain slip fit of push-pull tube attachment bolt (24) at the elevator arm (25); tighten jam nut and safety wire. Secure push-pull tube (29) with bolt (28), washer (26), nut (27) and cotter pin (28).

NOTE : INSPECT PUSH-PULL TUBE (29) AND FORK TO ENSURE THAT THREADS
OF PUSH-PULL TUBE ARE ENGAGED PAST 0.06 INCH INSPECTION HOLE
IN FORK.

- K. Remove temporary external control locks and control column holding tool.

- L. With inclinometer installed on elevator, adjust the bellcrank stop bolts (aft of bellcrank) to provide up travel and a down travel as indicated in Chapter 1, General Information.

CAUTION: MAKE SURE ELEVATOR BELLCRANK IS STRIKING STOP BOLT AND IS NOT LIMITED BY OTHER STRUCTURAL INTERFERENCE.

- M. Install turnbuckle clips (11) on the turnbuckles (12) and secure stop bolts with jamnuts.

WARNING: ENSURE THAT ELEVATOR CONTROL HAVE FREEDOM OF MOVEMENT AND ELEVATOR MOVES IN PROPER DIRECTION WHEN OPERATED BY THE CONTROL WHEEL. PULL THE CONTROL WHEEL AFT, BOTH ELEVATORS WILL DEFLECT UP. PUSH THE CONTROL WHEEL FORWARD, BOTH ELEVATORS WILL DEFLECT DOWN.

WARNING: ENSURE AILERON CONTROLS HAVE FREEDOM OF MOVEMENT AT THE EXTREME POSITION OF THE ELEVATOR CONTROL.

- N. Install stabilizer fairings, center pedestal cover and tailcone access.

3. Rigging Elevator Trim Control System (Refer to Figure 7).

- A. Remove the tailcone access and RH pedestal cover.
 B. Remove the center floor panel aft of pedestal and elevator trim access on the horizontal stabilizer.
 C. Place a suitable support under tailcone.
 D. Loosen the stop blocks by loosening attaching nuts and bolts.
 E. Adjust the cable tension on the elevator trim control cables. Refer to Chapter 1, General Information.

NOTE: If an electric trim or autopilot is installed, refer to Chapter 1, General Information, for cable tension.

NOTE: Cable tension should be adjusted when ambient temperature is 65°F to 95°F. Allow airplane temperature to stabilize for a period of 4 hours.

- F. Remove cotter pin, nut, washer and bolt from push-pull tube at trim tab.
 G. Rotate the elevator trim control wheel forward (nose down) until forward chain and the trim actuator chain have approximately two links clearing the sprockets.

NOTE: If the elevator trim indicator reaches its extreme travel during rigging, the indicator can be repositioned by removing the elevator trim control wheel, moving the indicator and reinstalling the control wheel.

- H. Establish neutral position of trim tab. Set inclinometer to 0 degrees.

NOTE: If trim tab and right elevator do not align within .15 inch (refer to figure 3A), the right elevator and trim tab assembly must be replaced.

- I. With the elevator in neutral (elevator horns aligned with stabilizer and the chains in position described in Step G, adjust trim actuator by rotating push-pull tube so that the push-pull tube hole and the elevator trim tab horn attaching hole align with the trim tab positioned approximately 12 degrees up from neutral (neutral position is alignment of the outboard trailing edge of the trim tab with the elevator trailing edge).
 J. Connect the push-pull tube to the elevator trim tab horn with bolt, washer, nut and cotter pin.
 K. With inclinometer installed on the trim tab, rotate the elevator trim control wheel so the elevator trim is positioned up. Slide aft stop block forward against the rub block and tighten.
 L. Rotate the elevator trim control wheel until trim tab is positioned down. Slide the forward stop block against the rub block and tighten.

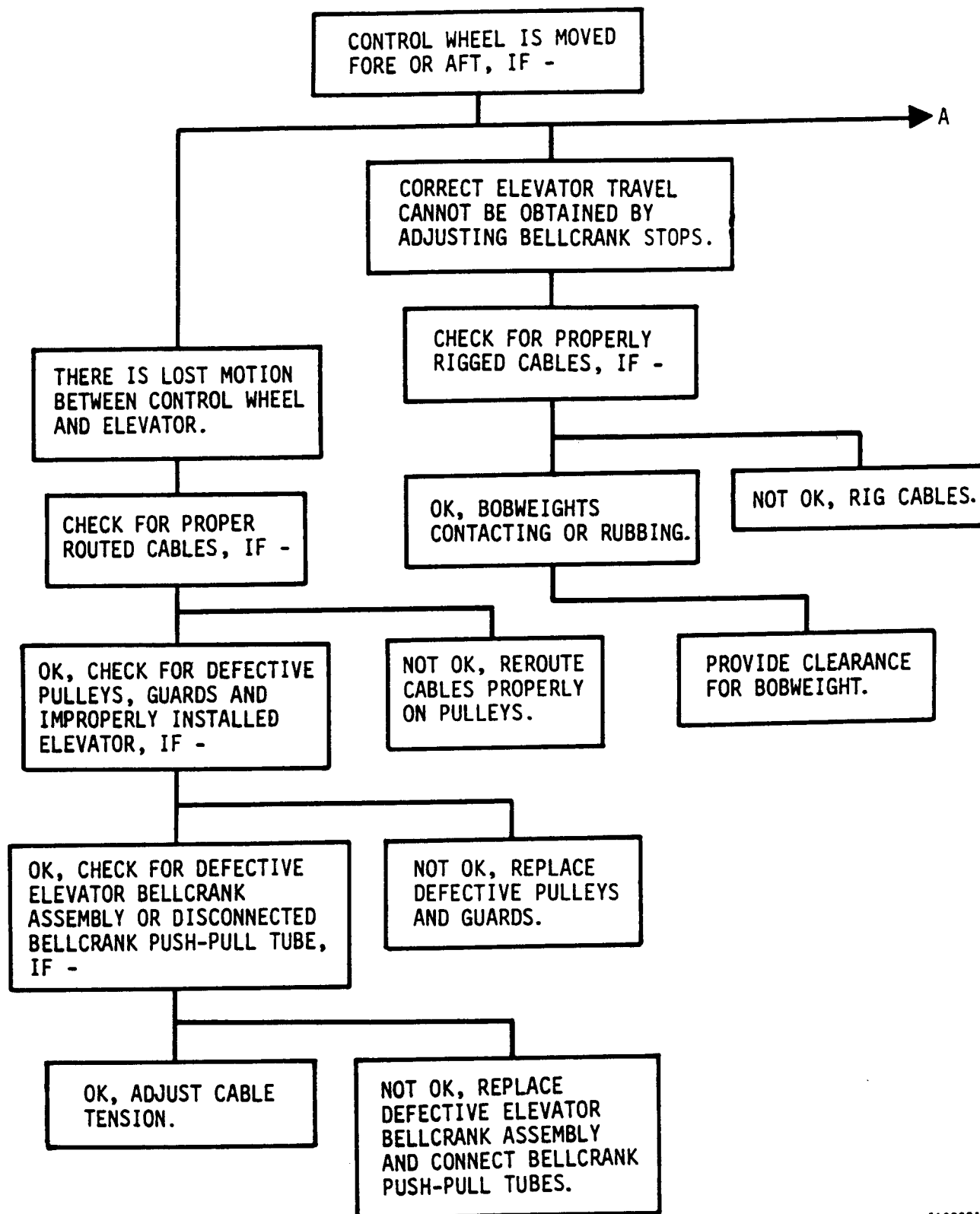
WARNING: ENSURE THAT WHEN TRIM CONTROL INDICATOR IS INDICATING NOSE UP, THE TRIM TAB IS IN THE DOWN POSITION AND THAT WHEN THE TRIM CONTROL INDICATOR IS INDICATING NOSE DOWN POSITION, THE TRIM TAB IS IN THE UP POSITION.

WARNING: ENSURE THAT THE TRIM TAB PUSH-PULL TUBE DOES NOT ASSUME AN OVERCENTER POSITION WHILE IN THE DOWN TRAVEL POSITION.

WARNING: ON AIRPLANES C0907 AND ON, ENSURE THAT THERE IS A MINIMUM OF ONE INCH REMAINING AT FORWARD AND AFT SPROCKETS AT EACH EXTREME TRAVEL.

- M. Install turnbuckle clips on the turnbuckle.
 N. Install floor panels, carpet, pedestal cover, tailcone access and elevator trim actuator access.

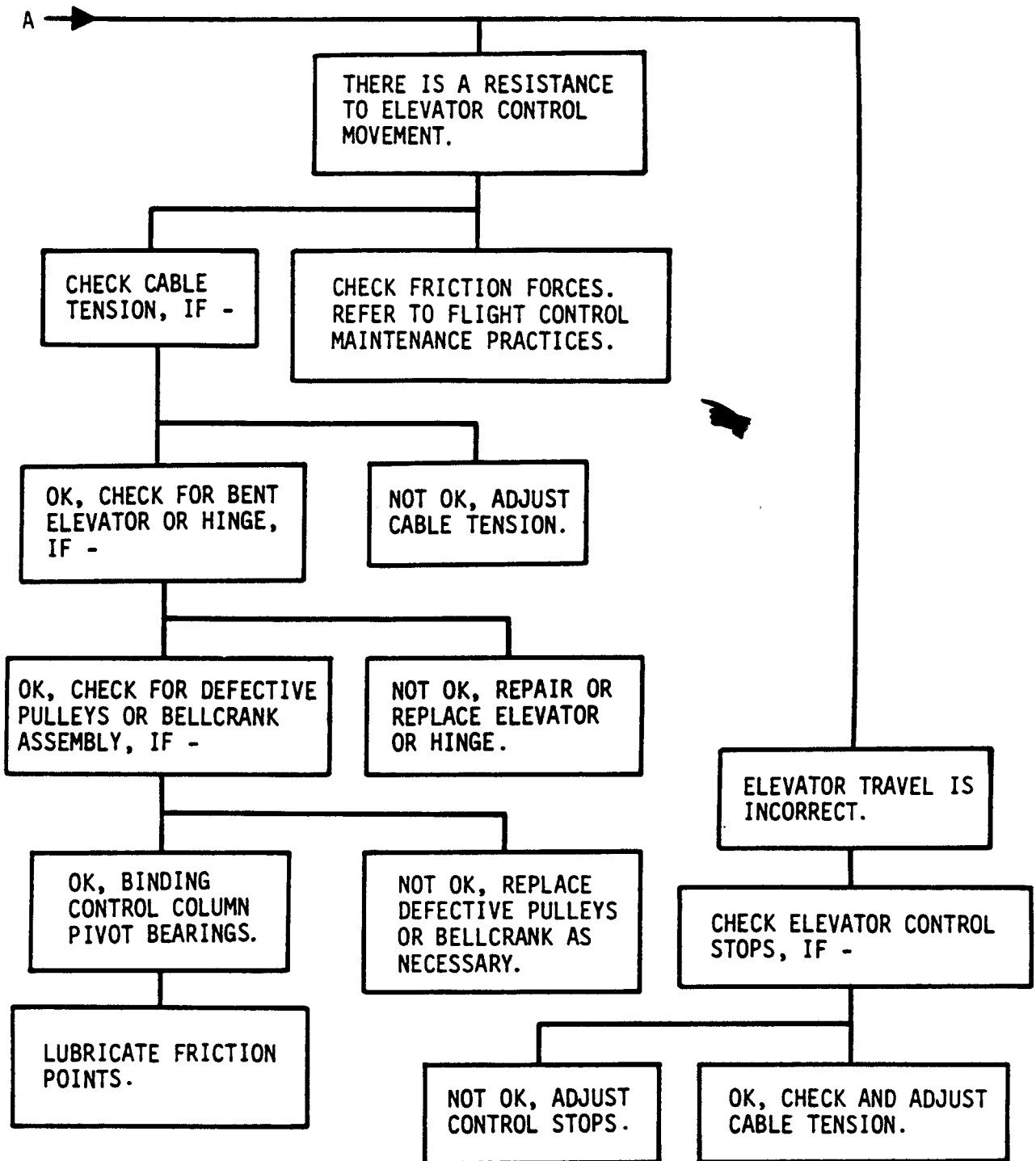
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MODEL 421
SERVICE MANUAL



Troubleshooting - Elevator System
Figure 1 (Sheet 1)

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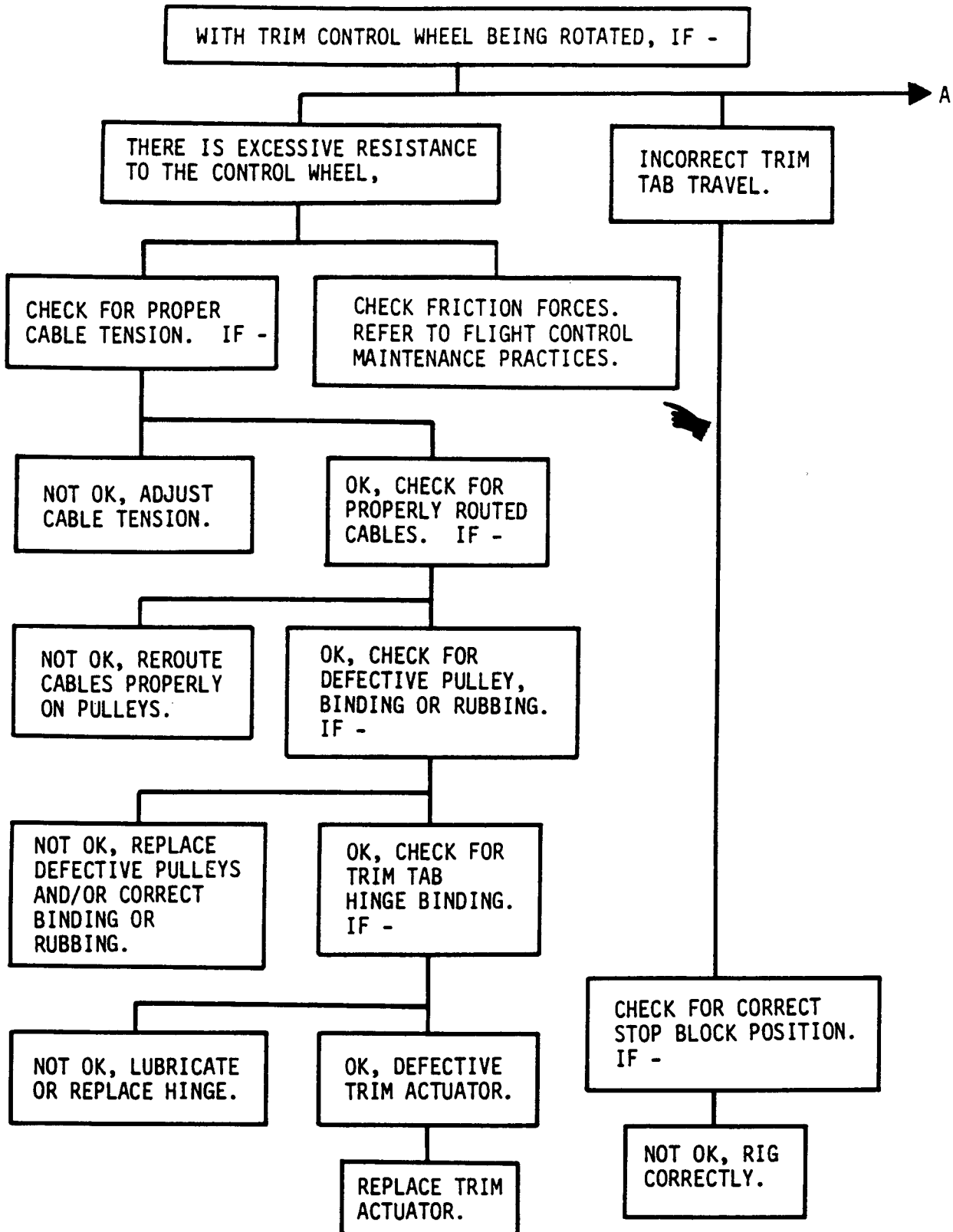
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Troubleshooting - Elevator System
Figure 1 (Sheet 2)

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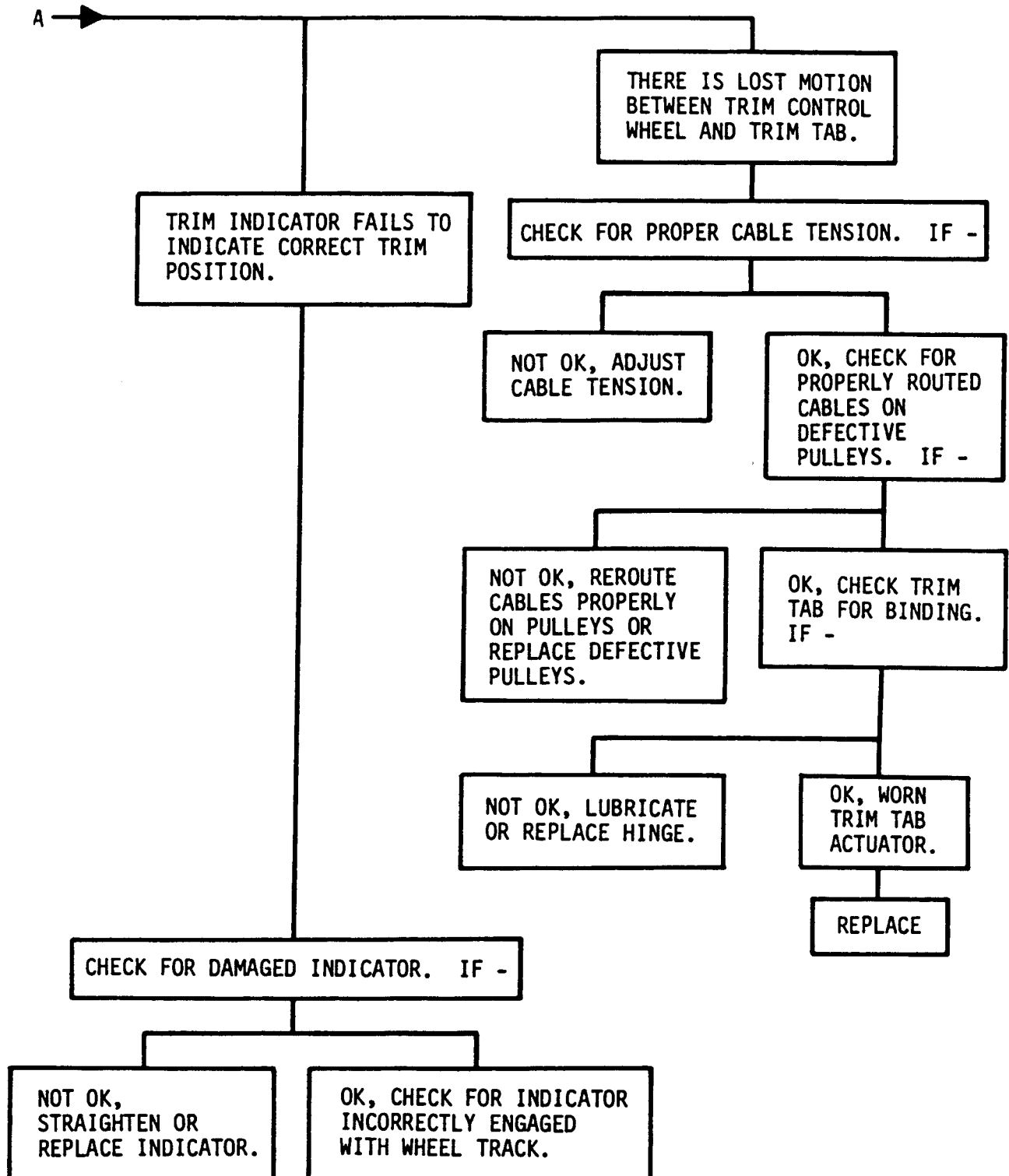
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Troubleshooting Chart - Elevator Trim
Figure 2 (Sheet 1)

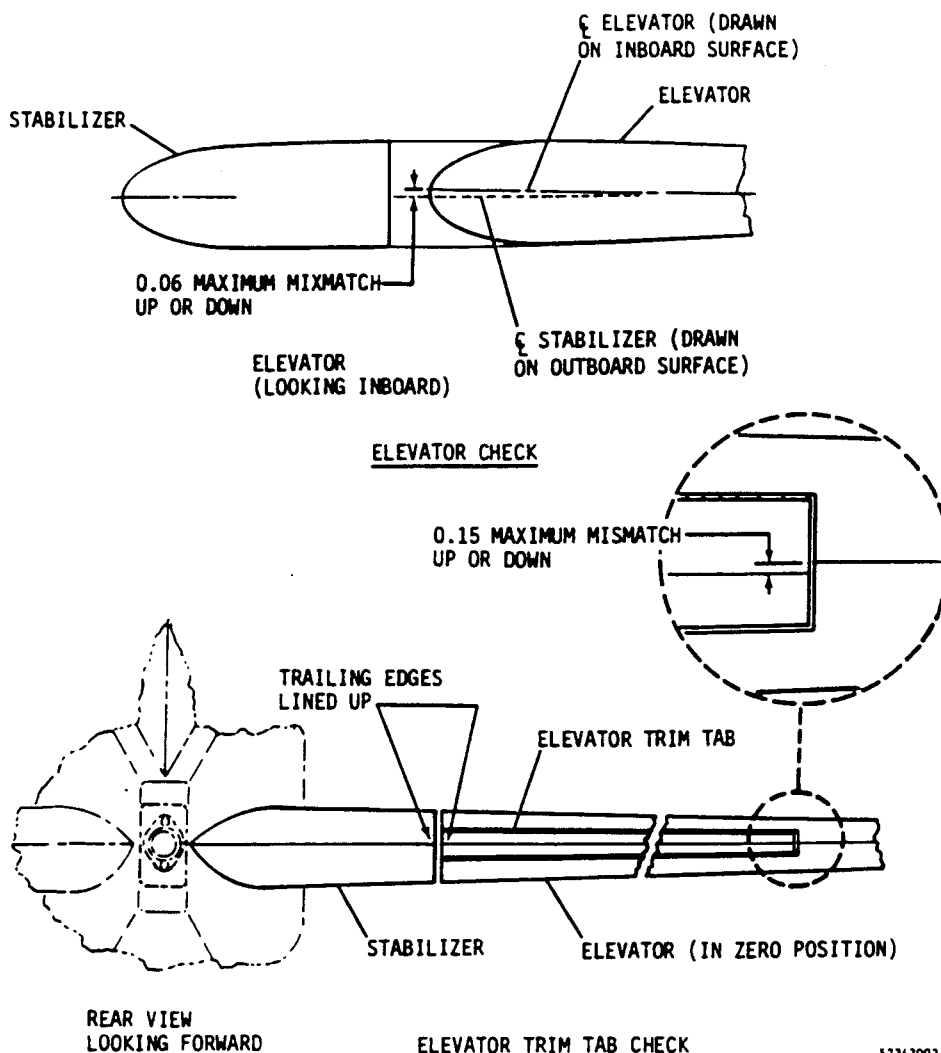
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MODEL 421
SERVICE MANUAL



Troubleshooting Chart - Elevator Trim
Figure 2 (Sheet 2)

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ELEVATOR TRIM TAB CHECK

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Inspection/Check**Rigging Elevator Control and Elevator Trim Control Systems
Figure 3A**

1. Tools and Equipment.

NOTE: Refer to troubleshooting for tools and equipment requirements.

2. Elevator and Elevator Trim Tab Cable Check.

NOTE: Angular dimensions for checking elevators and elevator trim tab are measured by placing an inclinometer on the elevator or elevator trim tab surface. Elevator is in neutral position when the elevator horns align with stabilizer. The elevator trim tab is in neutral position when streamlined with the elevator.

A. Elevator and Elevator Trim Tab Cable Check.

- (1) Place elevator and trim tab in neutral position.
- (2) Place tensiometer on the elevator cable and read the cable tension.
- (3) Place tensiometer on the elevator trim cable and read the cable tension.

NOTE: Access to elevator and elevator trim cables is gained through the tailcone.

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL

NOTE: Cable tension should be adjusted when ambient temperature is 65°F to 95°F. Allow airplane temperature to stabilize for a period of four hours.

3. Elevator and Trim Tab Deflection Check.

- A. For elevator and elevator trim tab deflection, refer to Chapter 2, Detailed Inspection Procedures.

4. Inspect Elevator and Elevator Trim Tab.

- A. Remove access covers on pedestal, cabin floor panels, tailcone access panel, stabilizer fairing and trim actuator access cover to provide visual inspection of cables and pulleys.
B. Install access covers, fairings, floor panels and tailcone access panels after inspection.

Maintenance Practices

WARNING: WHEN MAINTENANCE IS PERFORMED ON ANY FLIGHT CONTROL SYSTEM OR FLIGHT CONTROL TRIM SYSTEM REQUIRING REMOVAL/INSTALLATION OF CABLES, ENSURE CABLES ARE NOT CROSSED DURING CABLE REINSTALLATION.

1. Removal/Installation Elevator (Refer to Figure 5).

A. Remove Elevator.

- (1) Remove stinger and stabilizer fairings, refer to Chapter 3, Stabilizers.
- (2) Remove bonding straps from elevator.
- (3) Remove cotter pin (8), nut (7), washer (9) and bolt (11) attaching push-pull tube to trim tab horn (6).

NOTE: Steps (3 and 4) not applicable for left elevator.

- (4) Remove trim tab push-pull tube (10) by unscrewing from trim tab actuator.
- (5) Remove elevator tip by removing screws.
- (6) Remove nut (27), washer (28) and remove taper pin (20) by installing washers and nut on the opposite end of the taper pin. Tighten nut as required to free taper pin.
- (7) Remove nuts (22) and screws (19) from collar (21) and elevator arm (15).
- (8) Support the elevator and remove cotter pins (4), nuts (5), washers (2 and 3) and bolts (1) at elevator hinge brackets.
- (9) Remove collar (21) from torque tube (23).

CAUTION: THE COLLAR (21) AND TORQUE TUBE (23) ARE DRILLED AND TAPER REAMED AS A MATCHED SET AND MUST BE INSTALLED AS A MATCHED SET. WHEN A NEW COLLAR IS INSTALLED ON AN OLD TORQUE TUBE, A NEW MATCHED SET IS ESTABLISHED.

- (10) Remove the elevator by pulling aft and outboard while guiding the torque tube (23) through the horizontal stabilizer ribs.

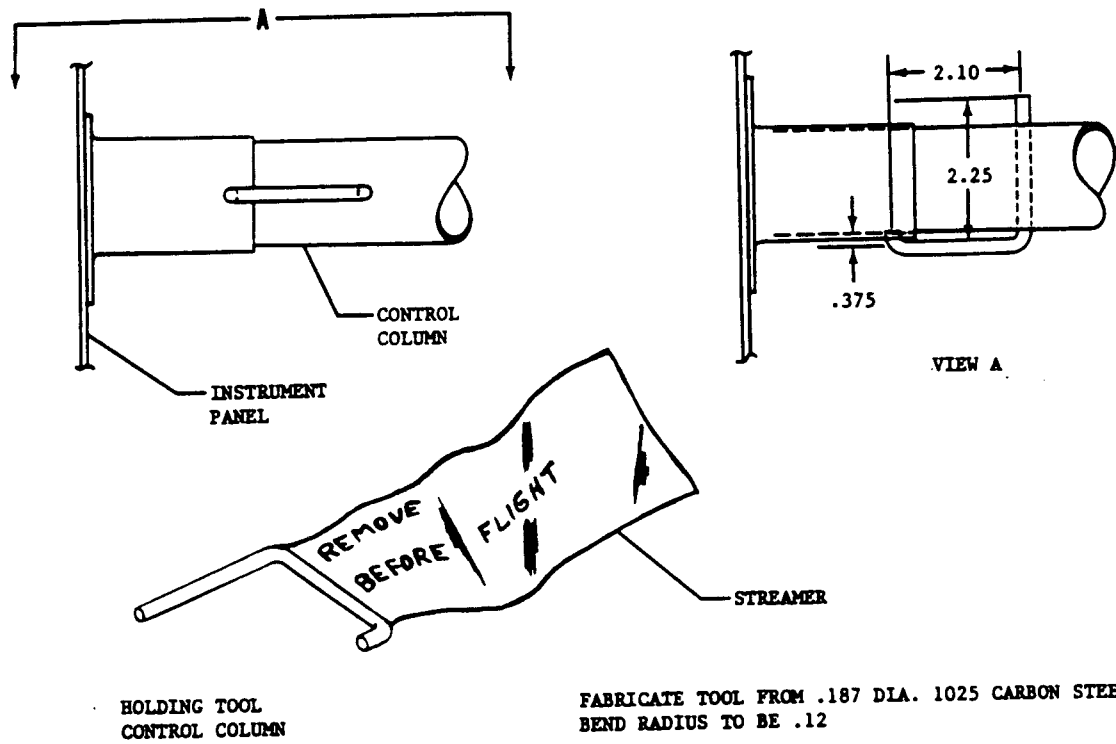
NOTE: Counterweights are located in the forward outboard elevator tips. Support the elevator tips during removal to prevent damage to elevator.

B. Install Elevator.

- (1) Insert torque tube (23) into horizontal stabilizer and slide collar (21) on torque tube (23).
- (2) Secure elevator to horizontal stabilizer with bolts (1), washers (2 and 3), nuts (5) and cotter pins (4). Install elevator tip with screws.
- (3) Align taper reamed hole in collar (21) and torque tube (23) and install taper pin (20) with washer (28) and nut (27).

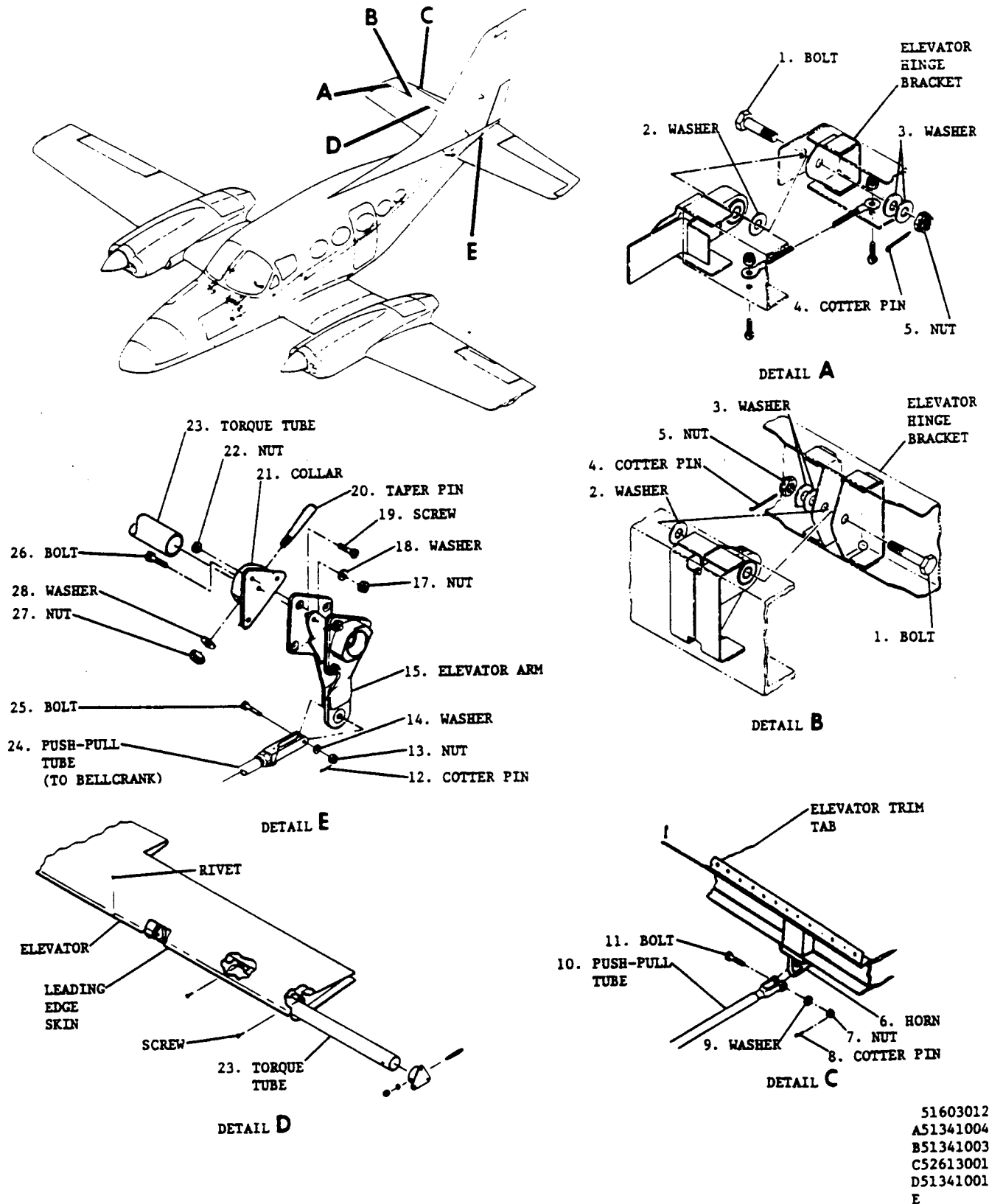
NOTE: Install taper pin (20) with wet primer Zinc Chromate Primer Type 1-G, MIL-P-8585. Torque nut (27) to 50, +10, -10 inch-pounds.

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL



Control Column Holding Tool
Figure 4

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Elevator and Torque Tube Installation
Figure 5

- (4) Secure collar (21) to elevator arm (15), using screws (19) and nuts (22).
- (5) If a new collar (21) is being installed on the original elevator torque tube (23), proceed as follows:
 - (a) Install elevator on aircraft with new collar (21) in accordance with steps (1), (2) and (4).

NOTE: The replacement collar will be 1.85 inches long. Ensure identification of collar part number, left and right-hand collars are not interchangeable.

- (b) Using temporary external lock, lock elevator in neutral position.
- (c) Using the pilot holes in the collar (21), drill a 1/8 (.125) hole through elevator torque tube (23).
- (d) Enlarge hole in stages until small end of a Number 4 B & S taper reamer will enter the hole.
- (e) Line ream hole with Number 4 reamer to a diameter which will permit taper pin (20) to extend not more than 1/16 inch above surface of collar (21).
- (f) Install taper pin (21) in accordance with Step (3).
- (6) Screw trim tab push-pull tube (10) with trim tab actuator attached into actuator. Secure trim tab push-pull tube (10) to trim tab horn (6) with bolt (11), washer (9), nut (7) and cotter pin (8).
- (7) Secure bonding straps to elevator and horizontal stabilizer.
- (8) Rig elevator and tab, refer to Adjustment/Test.
- (9) Install fairings and stinger.

2. Removal/Installation Elevator Torque Tube (See Figure 5).

NOTE: Do not remove the elevator torque tube unless replacement is necessary.

A. Remove Torque Tube.

- (1) Remove elevator from aircraft, refer to Removal/Installation Elevator.
- (2) Drill out rivets from leading edge skin of elevator as required to gain access to torque tube mounting screws.

CAUTION: DURING ALL DRILLING OPERATIONS, TAKE PRECAUTIONS TO PREVENT ENLARGING HOLES OR DAMAGE TO EXISTING STRUCTURE.

- (3) Drill out rivets, securing torque tube (23) to rib.
- (4) Spread leading edge skin and remove screws securing torque tube (23) to structure. Remove torque tube.

B. Install Torque Tube.

- (1) Install torque tube (23) in elevator and secure with screws.

NOTE: To facilitate installation of torque tube, drill out attaching rivets at rib and spar as required to gain access for bucking rivets.

- (2) Drill holes through torque tube flange to match drilled out rivet holes in elevator assembly rib.
- (3) Secure torque tube (23) flange to rib, using same size and type rivets removed.
- (4) Secure leading edge skin, using the same size and type rivet as that removed.
- (5) Install elevator, refer to Removal/Installation Elevators.

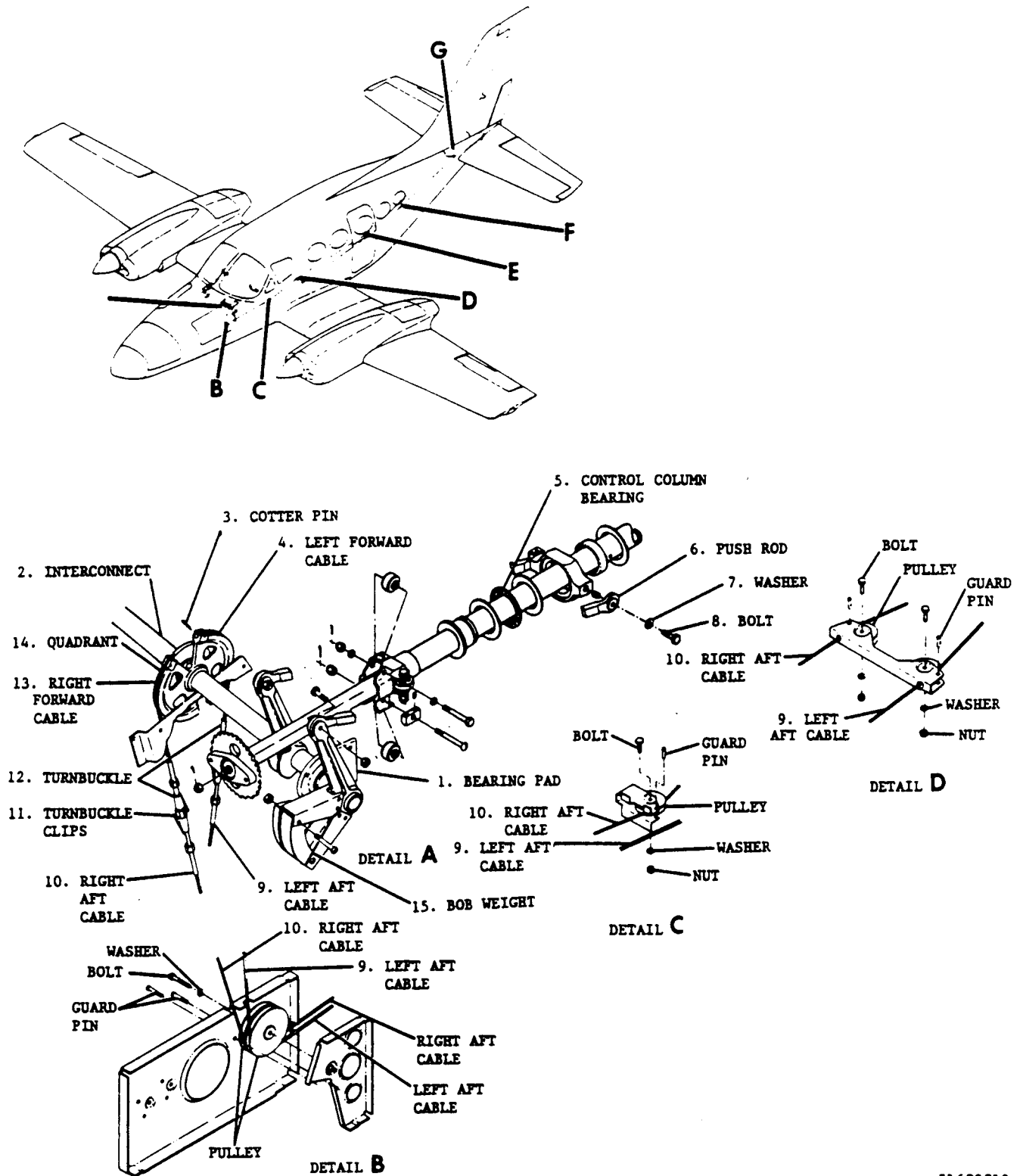
3. Removal/Installation Elevator Bellcrank (See Figure 6).

A. Remove Elevator Bellcrank.

- (1) Remove tailcone access and left access cover from pedestal.
- (2) Remove turnbuckle clip (11) and loosen either turnbuckle (12) to release cable tension on cables (9 and 10).
- (3) Disconnect cables (9 and 10) from bellcrank (44) by removing cotter pins (16 and 36), nuts (17 and 37) and bolts (20 and 34).

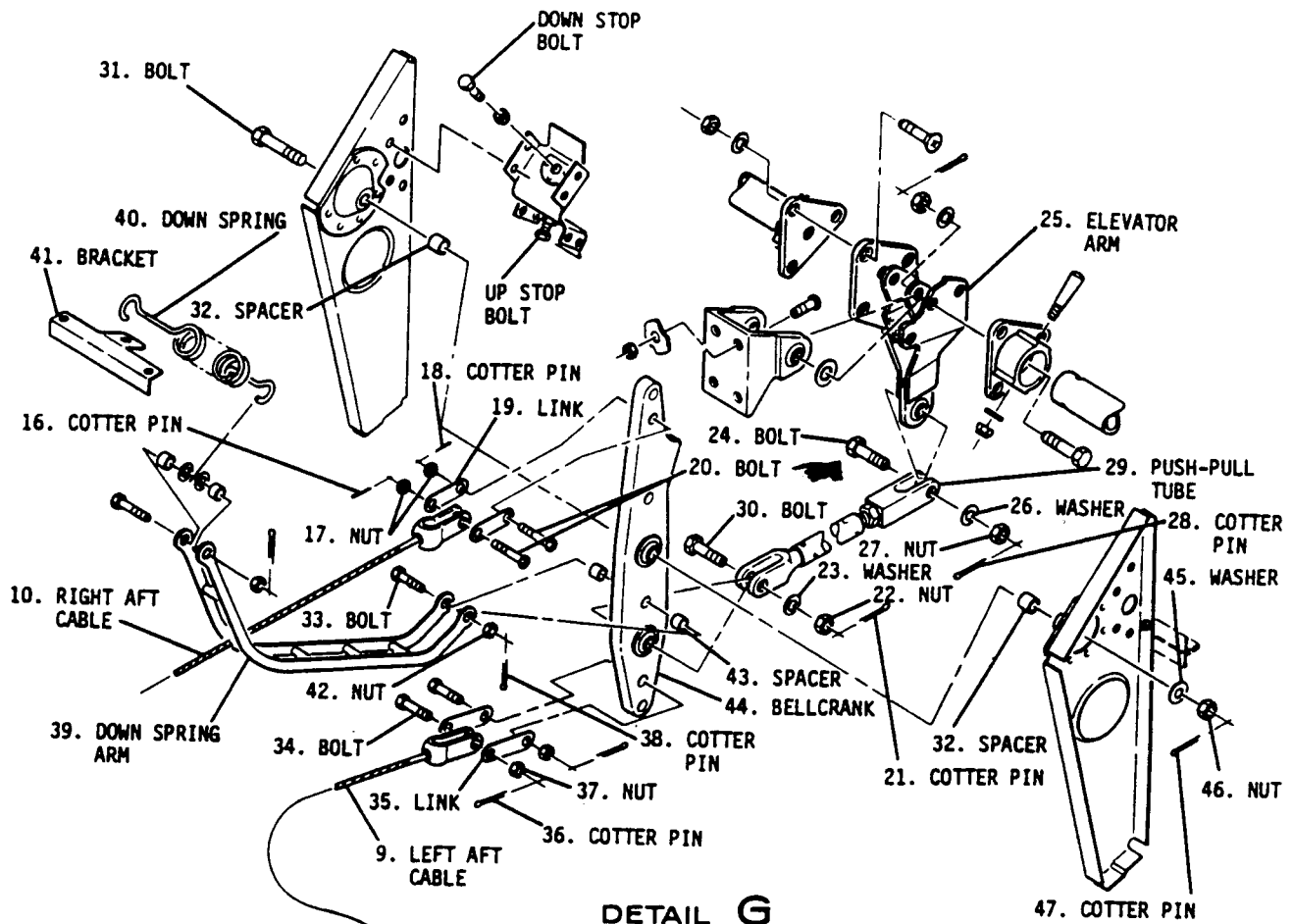
NOTE: When removing or installing the right aft cable (10), check the correct routing through the down spring arm (39).

NOTE: If an autopilot or IFCS (optional) equipment is installed, disconnect cables from elevator bellcrank, refer to Chapter 14.

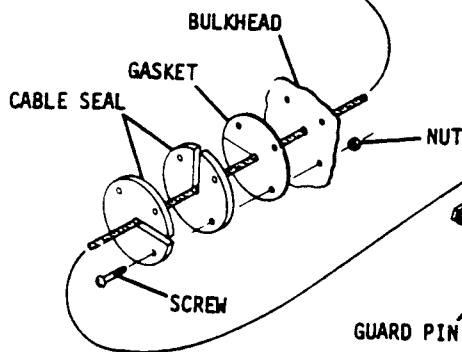


Elevator Control System Installation
Figure 6 (Sheet 1 of 2)

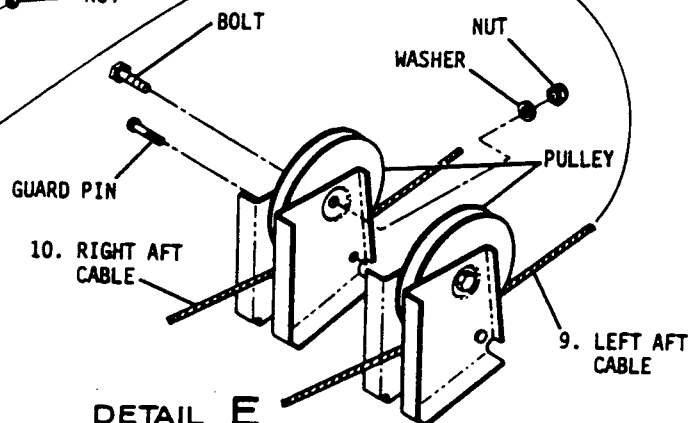
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DETAIL G



DETAIL F



DETAIL E

Elevator Control System Installation
Figure 6 (Sheet 2)E51154010
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- (4) Disconnect bellcrank push-pull tube (29) from bellcrank (44) by removing cotter pin (21), nut (22), washer (23) and bolt (30).
- (5) Disconnect down spring (40) from bracket (41). At bellcrank (44) remove cotter pin (38), nut (42), bolt (33) and spacers (44) securing down spring arm (39) to bellcrank.
- (6) Remove bellcrank (44) from bracket by removing cotter pin (47), nut (46), washer (45), bolt (31) and spacers (32).

B. Install Elevator Bellcrank.

- (1) Position bellcrank (44) in bracket and secure with bolt (31), spacers (32), washer (45), nut (46) and cotter pin (47).
- (2) Connect down spring arm (39) to bellcrank (44), using bolt (33), spacers (43), nut (42) and cotter pin (38).
- (3) Connect down spring (40) to down spring arm (39) and bracket (41).
- (4) Connect bellcrank push-pull tube (29) to bellcrank (44), using bolt (30), washer (23), nut (22) and cotter pin (21).
- (5) Connect cables (9 and 10) to links (19 and 35), using bolts (20 and 34), nuts (17 and 37) and cotter pins (16 and 36).
- (6) Rig the elevator control system, refer to Adjustment/Test.
- (7) Install turnbuckle clips (11) on turnbuckles (12).
- (8) Install tailcone access and left access cover on pedestal.

4. Removal/Installation Elevator Quadrant (See Figure 6).

A. Remove Elevator Quadrant.

- (1) Remove pilot and copilot seats, refer to Chapter 12.
- (2) Remove elevator cable cover from pedestal.
- (3) Remove turnbuckle clips (11) and disconnect turnbuckles (12).
- (4) Disconnect push rods (6) from control column bearing (5) by removing bolts (8) and washer (7).
- (5) Disconnect bearing pads (1) from supports and the center pedestal structure by removing nuts and bolts.
- (6) Remove the interconnect (2) and quadrant (14) by tilting the right side up and working the interconnect assembly out on the left side of the aircraft.

B. Install Elevator Quadrant.

- (1) Slide the interconnect (2) and quadrant (14) into position and secure bearing pads (1) to supports with bolts and nuts.
- (2) Connect push rods (6) to control column bearing (5) with washers (7) and bolts (8).
- (3) Connect cables (9 and 10) to cables (4 and 13) with turnbuckles (11).
- (4) Rig elevator control system, refer to Adjustment/Test.
- (5) Install turnbuckle clips (11) on turnbuckles (12).
- (6) Install elevator cable cover.
- (7) Install pilot and copilot seats, refer to Chapter 12.

5. Removal/Installation Elevator Control Cables (See Figure 6).

A. Remove Elevator Cables.

- (1) Remove pilot and copilot seats and carpet as required to gain access to center floor panels.
- (2) Remove left access cover on pedestal and tailcone access.
- (3) Remove cable access on bottom of fuselage and floor panels along centerline of aircraft.
- (4) Remove turnbuckle clips (11) from turnbuckles (12) and disconnect turnbuckles.
- (5) Disconnect cables (4 and 13) from quadrant (14) by removing cotter pins (3).
- (6) Disconnect cables (9 and 10) from bellcrank (44) by removing cotter pins (16 and 36), nuts (17 and 37) and bolts (20 and 34).
- (7) Remove screws and nuts and remove cable seals and gaskets.
- (8) Remove guard pins from all the cable pulleys.
- (9) Tie guide wires to forward ends of cables (9 and 10) and remove cables by pulling aft into tailcone.

NOTE: When removing or installing the elevator cable (10), check the correct routing through the down spring arm (39).

B. Install Elevator Cables.

- (1) Attach guide wire to forward ends of cables (9 and 10) and pull forward into position.
- (2) Install guard pins in all cable pulleys.
- (3) Connect cables (9 and 10) to bellcrank links (19 and 35) with bolts (20 and 34), nuts (17 and 37) and cotter pins (16 and 36).
- (4) Install gaskets and cable seals to bulkhead with screws and nuts.
- (5) Route forward portions of cables (4 and 13) around quadrant (14) and secure cables to quadrant with cotter pins (3).
- (6) Connect forward cables (4 and 13) and aft cables (9 and 10) together with turnbuckles (12).
- (7) Rig elevator control system, refer to Adjustment/Test.
- (8) Install turnbuckle clips (11) on turnbuckles (12).
- (9) Install floor panels, tailcone access and access covers.
- (10) Install carpet, pilot and copilot seats.

6. Removal/Installation Elevator Arm (See Figure 5).**A. Remove Elevator Arm.**

- (1) Remove elevators, refer to Removal/Installation Elevators.
- (2) Disconnect bellcrank push-pull tube (24) from elevator arm (15) by removing cotter pin (12), nut (13), washer (14) and bolt (25).
- (3) Remove elevator arm (15) by removing cotter pins (16), nuts (17), washers (18) and bolts (26).

B. Install Elevator Arm.

- (1) Position elevator arm (15) in hinge bracket and secure with bolts (26), washers (18), nuts (17) and cotter pins (16).
- (2) Connect bellcrank push-pull tube (24) to elevator arm (15), using bolt (25), washer (14), nut (13) and cotter pin (12).
- (3) Install elevator, refer to Removal/Installation Elevators.

7. Removal/Installation Elevator Down Spring (See Figure 6).**A. Remove Elevator Down Spring.**

- (1) Remove tailcone access.
- (2) Remove cotter pin, nut, spacer and bolt from down spring arm (39).
- (3) Remove down spring (40) by unhooking from bracket (41).

B. Install Elevator Down Spring.

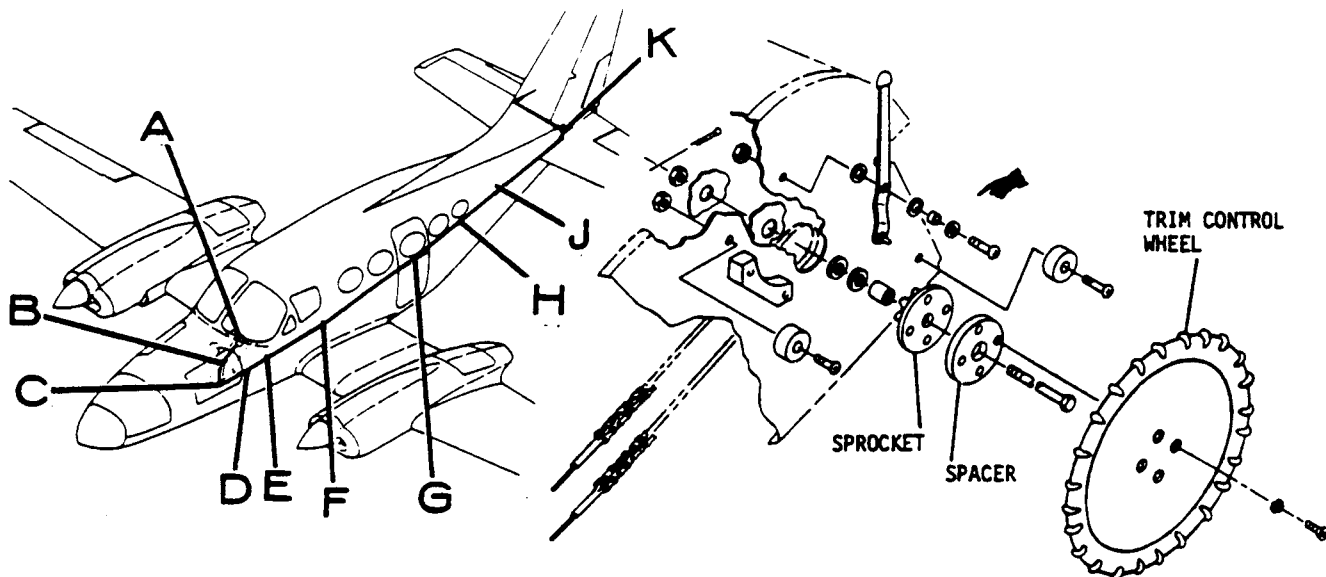
- (1) Connect down spring (40) to bracket (41).
- (2) Attach down spring (40) to down spring arm, using bolt, spacer, nut and cotter pin.
- (3) Install tailcone access.

8. Removal/Installation Elevator Aft Push-Pull Tube (See Figure 6).**A. Remove Elevator Aft Push-Pull Tube.**

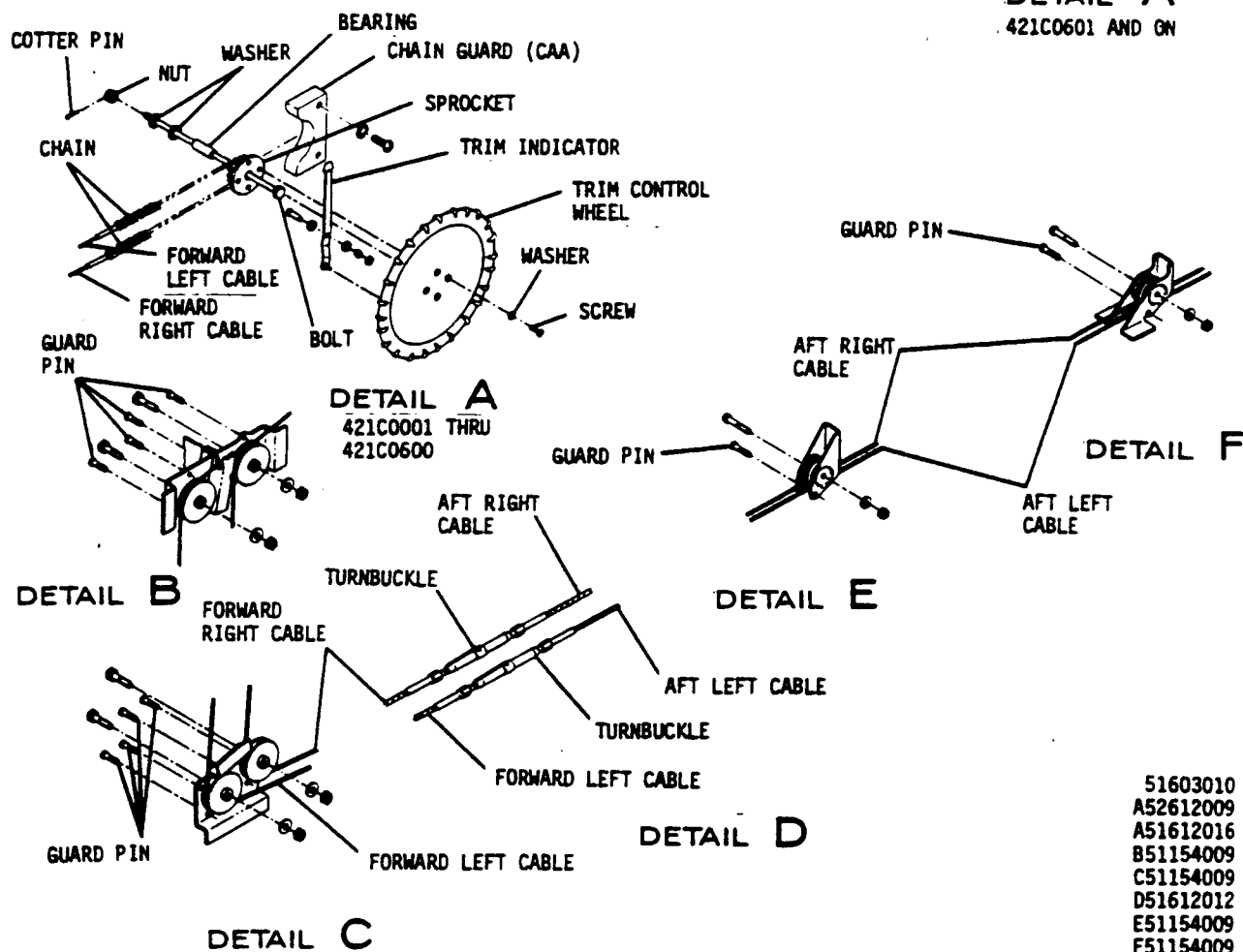
- (1) Remove tailcone access.
- (2) Remove stabilizer fairings and stinger.
- (3) Disconnect push-pull tube (29) from bellcrank (44) by removing cotter pin (21), nut (22), washer (21) and bolt (30).
- (4) Disconnect push-pull tube (29) from elevator arm (25) by removing cotter pin (28), nut (27), washer (26) and bolt (24).

B. Install Elevator Aft Push-Pull Tube.

- (1) Connect push-pull tube (29) to elevator arm (25) with bolt (24), washer (26), nut (27) and cotter pin (28).
- (2) Connect push-pull tube (29) to bellcrank (44) with bolt (30), washer (21), nut (22) and cotter pin (21).
- (3) Install stabilizer fairings and stinger.
- (4) Install tailcone access.



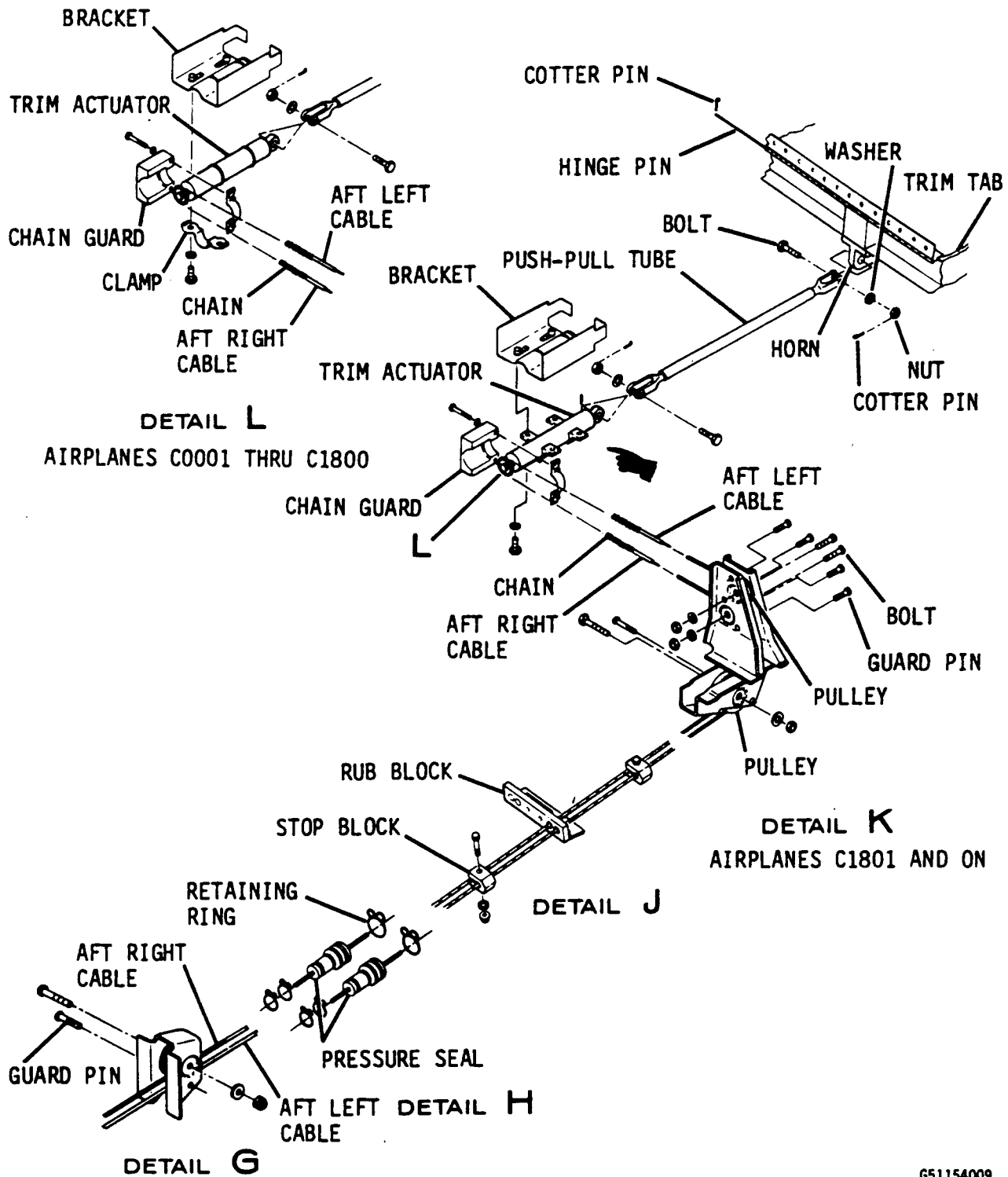
DETAIL A
421C0601 AND ON



51603010
A52612009
A51612016
B51154009
C51154009
D51612012
E51154009
F51154009

Elevator Trim Control System
Figure 7 (Sheet 1 of 2)

CESSNA AIRCRAFT COMPANY
421
SERVICE MANUAL



Elevator Trim Control System
Figure 7 (Sheet 2)

G51154009
H54613003
J51611037
K51613022A
L51613022

9. Removal/Installation Elevator Trim Tab (See Figure 7).

A. Remove Elevator Trim Tab.

- (1) Disconnect the push-pull tube from trim tab horn by removing cotter pin, nut, washer and bolt.
- (2) Remove cotter pin from each end of the hinge pin.
- (3) Remove hinge pin and remove trim tab.

B. Install Elevator Trim Tab.

- (1) Position trim tab to elevator hinge half and secure with hinge pin. Secure hinge pin at both ends with cotter pins.
- (2) Connect push-pull tube to trim tab horn with bolt, washer, nut and cotter pin.
- (3) Rig elevator trim system, refer to Adjustment/Test.

10. Removal/Installation Elevator Trim Tab Actuator (See Figure 7).

A. Remove Elevator Trim Tab Actuator.

- (1) Refer to Chapter 1 and remove cable access panel just aft of pedestal and elevator trim actuator access panel on right horizontal stabilizer.
- (2) Remove turnbuckle clips and loosen turnbuckle to release tension on aft right and left cables.
- (3) Remove right elevator, refer to Removal/Installation Elevators.
- (4) Disconnect the push-pull tube from the actuator by removing cotter pin, nut, washer and bolt. Reinstall screw in actuator.
- (5) Remove chain guard from the trim actuator by removing screws and washers; disengage the chain from sprocket.
- (6) Remove clamps securing trim actuator to bracket by removing bolts and washer. Remove the actuator.

NOTE: For actuator disassembly, refer to Disassembly/Assembly Elevator Trim Tab Actuator.

B. Install Elevator Trim Tab Actuator.

WARNING: DO NOT MIX OR SUBSTITUTE SCREW ASSEMBLIES IN ACTUATORS. ALWAYS CHECK RIGGING AFTER REMOVAL OF SCREW ASSEMBLY.

- (1) Align trim actuator in the bracket and secure with clamps, washers and bolts.

NOTE: Ensure trim actuator retaining rings are seated in bracket grooves.

- (2) Connect push-pull tube to trim actuator screw, using bolt, washer, nut and cotter pin. Unscrew the push-pull tube from the trim actuator and retain for later installation.
- (3) Install the right elevator, refer to Removal/Installation Elevators.
- (4) Position chain on the trim actuator sprocket and rig trim control system, refer to Adjustment/Test.
- (5) Install turnbuckle clips on the cable turnbuckles.
- (6) Install chain guard on the trim actuator, using clamp, washer and screw.
- (7) Install cable access panel and trim actuator access panel.

C. Removal/Installation of Trim Tab Actuator Screw Assembly.

NOTE: When removal of the trim tab actuator screw assembly is required for lubrication, replacement, etc., the following procedure should be used to insure the screw assembly is installed in its original location.

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL

(1) Removal.

- (a) Position the trim tab and control surface assembly as necessary to allow removal of the push rod and the screw assembly. Disconnect push rod at the trim tab end. Accurately count and record the number of turns necessary to remove the push rod and screw assembly. Gently pull on the push rod during removal to ascertain the exact point when the threads become disengaged. Note this position accurately and also note the position of the bolt head that attaches the push rod to the screw assembly. This is necessary in order to replace the push rod and screw assembly in the exact same position as before removal.

WARNING: DO NOT MIX OR SUBSTITUTE SCREW ASSEMBLIES IN TRIM TAB ACTUATORS. ALWAYS CHECK RIGGING AFTER REMOVAL OF SCREW ASSEMBLY.

(2) Installation.

CAUTION: MAINTAIN A MINIMUM OF 0.40 INCH OF THREAD ENGAGEMENT OF ACTUATOR SCREW. MINIMUM ENGAGEMENT IS TO BE MEASURED AT THE FULLY EXTENDED POSITION.

- (a) Install push rod and screw assembly with the bolt head in the exact same position as noted during removal. Turn the push rod to the left (counterclockwise) 1/8 of a turn. Apply pressure on the push rod and screw assembly in a forward direction and turn to the right (clockwise) the same number of turns as noted during removal. Check the direction of the bolt that attaches the push rod to the screw assembly to ensure that it is located properly as shown (bolt head outboard).

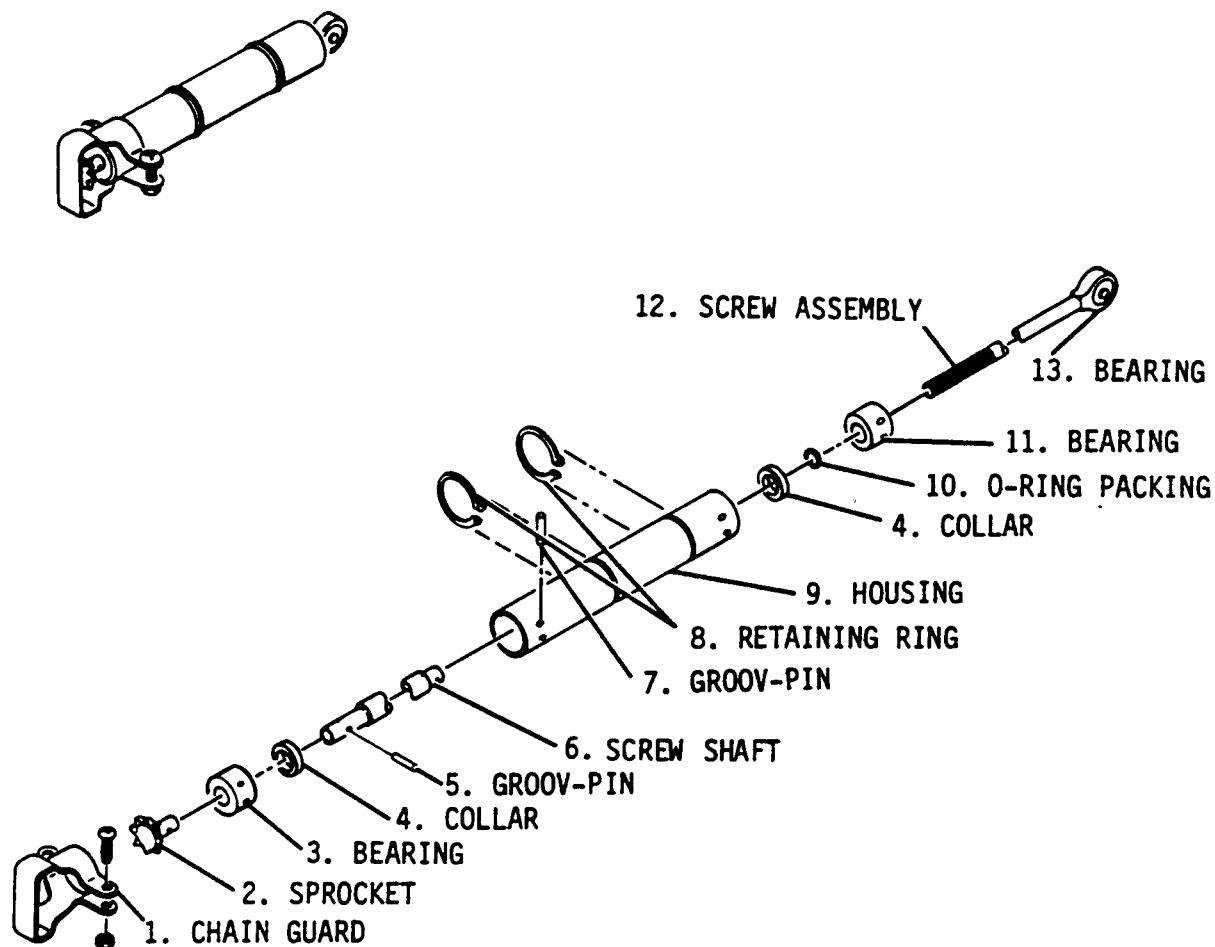
NOTE: The screw assembly has a quad lead type thread. Following the above procedures exactly will insure the trim tab screw assembly has been installed in the exact same position.

Actuator Assembly	Screw Assembly	Used On
1260074-4	0310362-5	Airplanes C0001 Thru C0600
0815097-2	0815096-1	Airplanes C0601 Thru 1800
5315097-1	5815203-1	Ariplanes C1801 and On

WARNING: INSURE PROPER SCREW IS INSTALLED IN ACTUATOR ASSEMBLY. DO NOT SUBSTITUTE OR INTERMIX.

NOTE: This listing is not to be used for ordering parts. Spares replacement data is obtained from the airplane Parts Catalog.

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MODEL 421
SERVICE MANUAL

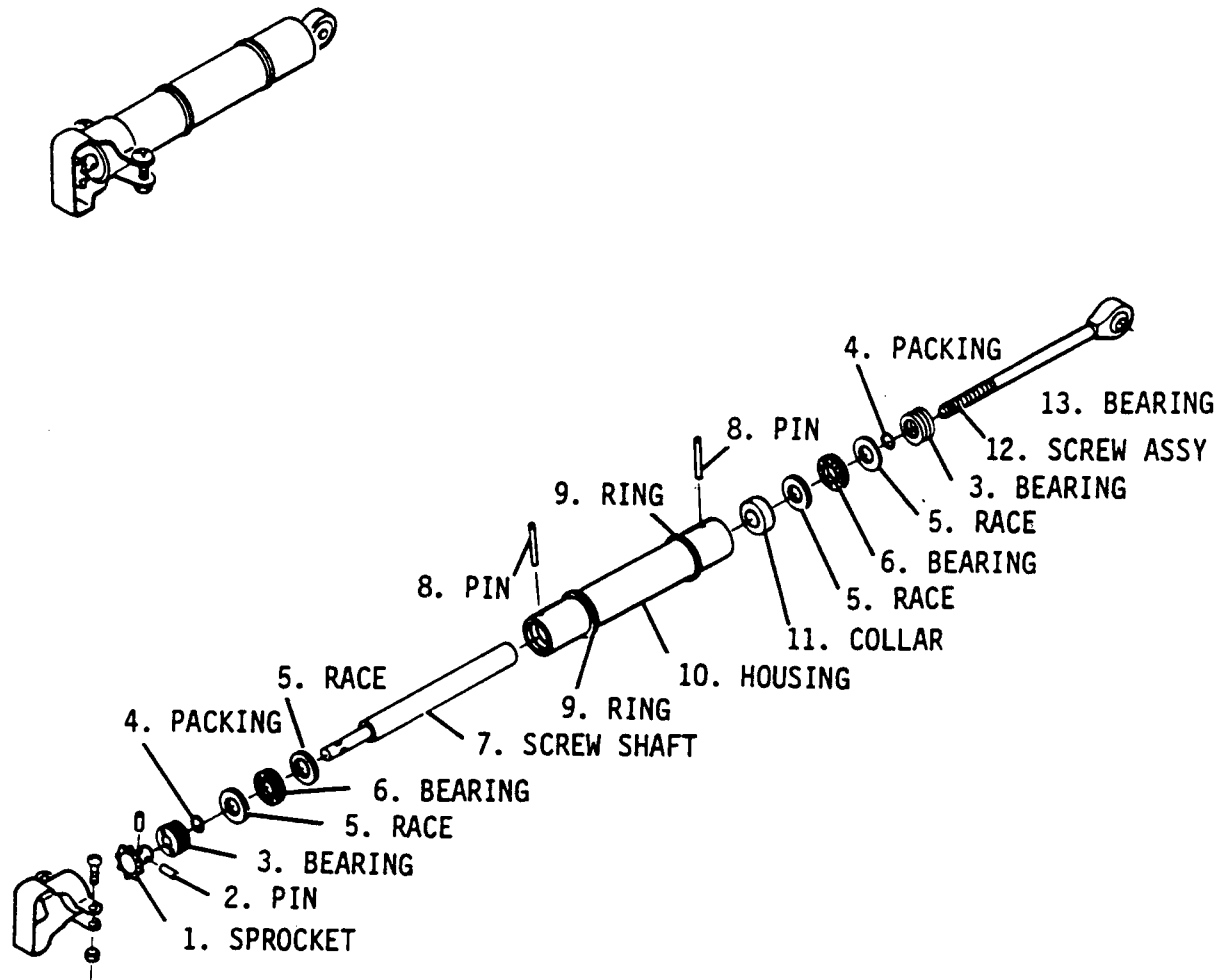


AIRPLANES C0001 THRU C0600

14631001

Elevator Trim Tab Actuator
Figure 8 (Sheet 1)

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL

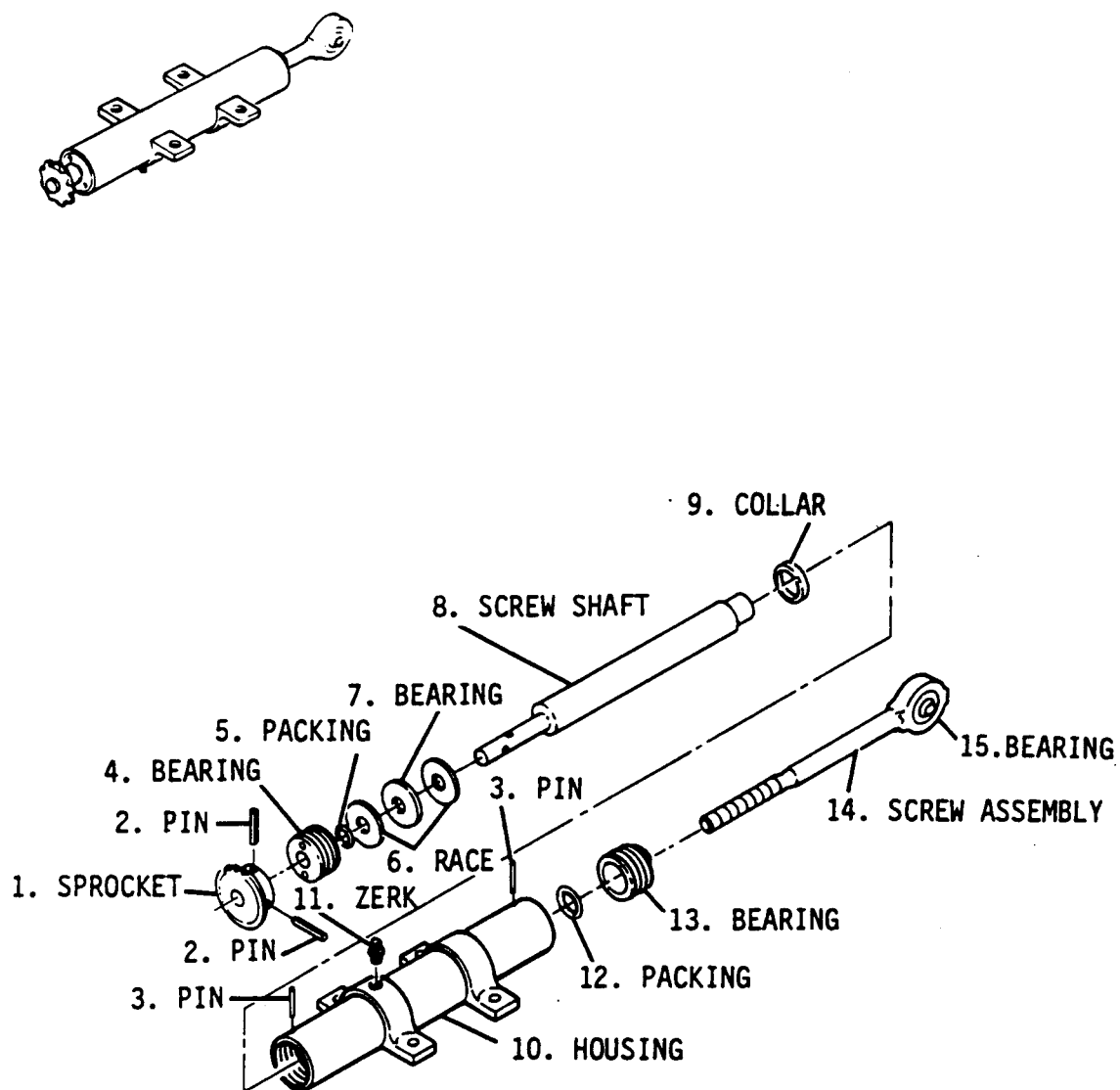


AIRPLANES C0601 THRU C1800

51612022

Elevator Trim Tab Actuator
Figure 8 (Sheet 2)

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL



AIRPLANES C1801 AND ON

52612010

Elevator Trim Tab Actuator
Figure 8 (Sheet 3)

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL

11. Disassembly/Assembly Elevator Trim Tab Actuator (Refer to Figure 8).

A. Tools and Equipment.

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

Name	Number	Manufacturer	Use
Silicone Grease (Light Consistency)	No. 33	Dow Corning Corp. Midland, Michigan 48641	To lubricate screw housing and threads in trim tab actuator.

B. Disassemble Trim Tab Actuator (Airplanes C0001 Thru C0601).

- (1) Disassemble elevator trim tab actuator assembly in accordance with Figure 8. This view clearly illustrates the proper relationship of all component parts.
- (2) Do not remove bearing (13) from screw assembly (12) unless replacement parts are required.
- (3) Clean all component parts, except bearing (13), by washing in suitable solvent. Do not clean sealed bearing (13).
- (4) Inspect all component parts for obvious indications of damage such as stripped threads, cracks, deep nicks and dents.

NOTE: If thread condition requires replacement of either the internal or external screw, replace both parts.

- (5) Check bearing (3 and 11) and screw shaft (6) and screw assembly (12) for excessive wear and scoring. Refer to Figure 8A.

NOTE: Relative linear movement between internal thread screw shaft (6) and bearing (11) should be a maximum of 0.005 inches on actuator when set at room temperature.

- (6) Examine screws shaft(6) and screw assembly (12) for damaged threads or dirt particles that may impair smooth operation.
- (7) Check sprocket (2) for broken, chipped, and/or worn teeth.

CAUTION: DO NOT ATTEMPT TO REPAIR DAMAGED OR WORN PARTS OF THE ACTUATOR, DISCARD ALL DEFECTIVE ITEMS AND INSTALL NEW PARTS DURING REASSEMBLY.

- (8) Check bearing (13) for smoothness of operation.

C. Assembly Trim Tab Actuator (Airplanes C0001 thru C0601).

WARNING: DO NOT SUBSTITUTE ACTUATOR SCREWS. IMPROPER SCREW COULD CAUSE TRIM SYSTEM FAILURE.

NOTE: Discard the following items and install new parts during assembly: groov-pins (5 and 7) and o-ring packing (10).

- (1) During reassembly, lubricate collars (4) and screw shaft (6) with light consistency silicone grease (MIL-G-83261).

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL

- (2) Reassemble actuator in accordance with the following:
 - (a) Slip bearing (3) and collar (4) on screw shaft (6).
 - (b) Press sprocket (2) into hollow end of screw shaft (6), making sure pin holes are aligned. Press new groove-pins (5) into pin holes.
 - (c) Insert screw shaft (6), with assembled parts, into housing (9).

NOTE: Locate sprocket (2) at the end of housing (9) which is farthest from the groove for retaining ring (8).

- (d) Align pin holes in bearing (3) and housing (9). Press new groove-pin (7) into pin holes.
- (e) Insert collar (4), new o-ring packing (10), and bearing (11) into end of housing (9). Align pin holes in bearing and housing and install new groove-pin (7).

NOTE: If a new bearing is installed, fabricate a shim of .003 thickness to fit on the end of screw shaft (6) against bearing to maintain a minimum amount of free play while drilling new pin holes in the bearing. After holes are drilled in new bearing, remove and discard shim. If pin holes become oversize, drill out to 0.094 and install 0.094 roll pin.

- (f) If new parts are required, press bearing (13) into boss at end of screw assembly (12). Be sure force bears against outer race of bearing. Install screw assembly (12) in housing (9) and screw shaft (6).
- (g) Install retaining rings (8) in grooves provided on outside of housing (9).
- (h) Test actuator assembly by rotating sprocket (2) with fingers while holding bearing end of screw assembly (12). Screw assembly (12) should travel in and out of housing (9) smoothly, with no indication of binding.

D. Disassemble Trim Tab Actuator (Airplanes C0601 Thru C1800).

- (1) Disassemble elevator trim tab actuator assembly in accordance with Figure 8. This view clearly illustrates the proper relationship of all component parts.
- (2) Do not remove bearing (13) from screw assembly (12) unless replacement parts are required.
- (3) Clean all component parts except bearing (13) by washing in suitable solvent. Do not clean sealed bearing (13).
- (4) Inspect all component parts for obvious indications of damage such as stripped threads, cracks, deep nicks and dents.

NOTE: If thread condition requires replacement of either the internal or external screw, replace both parts.

- (5) Check bearings (3), screw shaft (7) and screw assembly (12) for excessive wear and scoring. Refer to Figure 8A.

NOTE: Relative free play between screw assembly (12) and actuator housing assembly should not exceed 0.010 inch. For actuator linear measurement procedure, refer to 5-20.

E. Assembly Trim Tab Actuator (Airplanes C0601 and C1800).

WARNING: DO NOT SUBSTITUTE ACTUATOR SCREWS. IMPROPER SCREW COULD CAUSE TRIM SYSTEM FAILURE.

NOTE: Discard the following items and install new parts during assembly: pins (2 and 8) and O-ring packing (4).

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL

- (1) During reassembly, lubricate collar (11) and screw shaft (7) with light consistency silicone grease (MIL-G-83261).
- (2) Reassemble actuator in accordance with the following:
 - (a) Slip bearing (6) and races (5), packing (4) and bearing (3) on screw shaft (7).
 - (b) Press sprocket (1) onto end of screw shaft (7), making sure pin holes are aligned. Press new pins (2) into pin holes.
 - (c) Insert screw shaft (7) with assembled parts into forward end of housing (10).

NOTE: Locate sprocket (1) at the end of housing (10) which is farthest from the groove for retaining ring (9).

- (d) Align pin holes in bearing (3) and housing (10). Press new pin (8) into pin holes.
- (e) Insert collar (11), races (5), bearing (6), packing (4) and bearing (3) into aft end of housing (10). Align pin holes in bearing and housing and install new pin (8).
- (f) If new parts are required, press bearing (13) into boss at end of screw assembly (12). Refer to Chapter 20 for bearing installation procedures. Be sure force bears against outer race of bearing. Install screw assembly (12) in housing (10) and screw shaft (7).
- (g) Install retaining rings (9) in grooves provided on outside of housing (10).
- (h) Test actuator assembly by rotating sprocket (1) with fingers while holding bearing end of screw assembly (12). Screw assembly (12) should travel in and out of housing (10) smoothly with no indication of binding.

F. Disassemble Trim Tab Actuator (Airplanes C1801 and On).

- (1) Disassemble elevator trim tab actuator assembly in accordance with Figure 8. This view clearly illustrates the proper relationship of all component parts.
- (2) Do not remove bearing (15) from screw assembly (14) unless replacement parts are required.
- (3) Clean all component parts except bearing (15) by washing in suitable solvent. Do not clean sealed bearing (15).
- (4) Inspect all component parts for obvious indications of damage such as stripped threads, cracks, deep nicks and dents.

NOTE: If thread condition requires replacement of either the internal or external screw, replace both parts.

- (5) Check bearings (4), screw shaft (8) and screw assembly (14) for excessive wear and scoring. Refer to Figure 8A.

NOTE: Relative free play between screw assembly (12) and actuator housing assembly should not exceed 0.010 inch. For actuator linear measurement procedure, refer to 5-20.

G. Assembly Trim Tab Actuator (Airplanes C1801 and On).

WARNING: DO NOT SUBSTITUTE ACTUATOR SCREWS. IMPROPER SCREW COULD CAUSE TRIM SYSTEM FAILURE.

NOTE: Discard the following items and install new parts during assembly: pins (2 and 3) and O-ring packing (5).

- (1) During reassembly, lubricate collar (9) and screw shaft (8) with light consistency silicone grease (MIL-G-83261).
- (2) Reassemble actuator in accordance with the following:
 - (a) Slip bearing (7) and races (6), packing (5) and bearing (4) on screw shaft (8).
 - (b) Press sprocket (1) onto end of screw shaft (8), making sure pin holes are aligned. Press new pins (2) into pin holes.

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL

- (c) Place collar (9) onto screw shaft (8).
- (d) Insert screw shaft (8) with assembled parts into forward end of housing (10).

NOTE: Locate sprocket (1) at the end of housing (10) which is nearest zerk fitting (11).

- (e) Align pin holes in bearing (4) and housing (10). Press new pin (3) into pin holes.
- (f) Insert packing (12) and bearing (13) into aft end of housing (10). Align pin holes in bearing and housing and install new pin (3).
- (g) If new parts are required, press bearing (15) into boss at end of screw assembly (14). Refer to Chapter 1, Bearings for bearing installation procedures.
- (h) Carefully install screw assembly (14), threading carefully to avoid damaging packing (12).

H. Replacing Actuator Parts (Airplanes C0601 Thru C1800) (Refer to Figure 8).

- (1) If new parts are required, press bearing (13) into boss at end of screw assembly (12). Be sure force bears against outer race of bearing.
- (2) Install bearing (3), races (5) and bearing (6) on screw assembly (12) as shown.

CAUTION: PUSHING THE SCREW INTO THE ACTUATOR CAN DAMAGE THE O-RING PACKING WHICH WOULD REQUIRE DISASSEMBLY AND REPAIR OF THE ACTUATOR.

- (3) Turn screw assembly (12) into housing (10) and turn screw assembly (12) clockwise until it is fully engaged in screw shaft (7).
- (4) Screw bearings (3) into housing (10), align holes and install new pin (8) to secure each bearing (3).

NOTE: The relative free-play between the screw assembly and housing (bearings) will not exceed 0.002 inch when set at room temperature. If free-play is excessive, tighten bearing (3). Drill new pin hole in bearing to match housing and reinstall pin.

- (5) On reassembly of actuator assembly, if bearing (3) or collar (11) are replaced, drill 0.062 hole in new part to match existing applicable hole in housing after adjustment to obtain free-play tolerance. Any portion of groov-pin extending beyond the surface of the housing (10) shall be removed.

NOTE: If pin hole (0.078) is worn oversize, drill out to 0.094 +0.003, -0.000 and install 0.094 diameter roll pin to hold bearing in place.

- (6) Slip sprocket (1) on forward end of screw shaft (7), align holes and install new pins (2).

I. Replacing Actuator Parts (Airplanes C1801 and On) (Refer to Figure 8).

- (1) Do not remove bearing (15) from screw assembly (14) unless replacement parts are required.
- (2) Clean all component parts except bearing (15) by washing in suitable solvent. Do not clean sealed bearing (15).
- (3) Inspect screw assembly (14) and screw shaft (8) for rust, damage threads, or dirt particles.
- (4) Assemble screw assembly (14) and screw shaft (8) together and check free-play. If any free-play exist replace screw assembly (14) and screw shaft (8).
- (5) Check bearings (4) and (13), screw shaft (8) and screw assembly (14) for excessive wear and scoring. Replace parts as required.

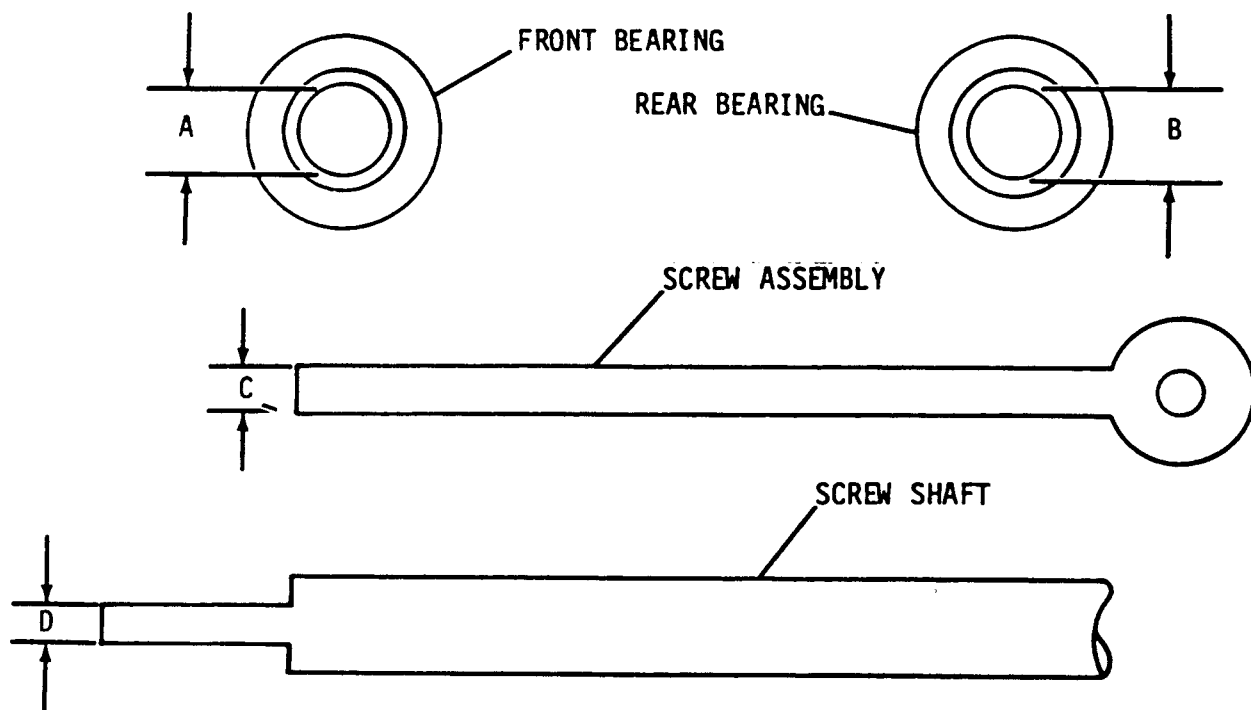
WARNING: Do not substitute actuator screws. Improper screws could cause trim system failure.

NOTE: Discard the following items and install new parts during assembly: pins (2) and (3) and O-ring packing (12).

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL

- (6) During reassembly, lubricate collar (9) and screw shaft (8) with light consistency silicone grease (MIL-G-83261).
- (7) Slip bearing (7) and races (6), packing (5) and bearing (4) on screw shaft (8).
- (8) Press sprocket (1) onto end of screw shaft (8), making sure pin holes are aligned. Press new pin (2) into pin holes.
- (9) Insert screw shaft (8) with assembled parts into forward end of housing (10).
- (10) Test actuator assembly by rotating sprocket (1) with fingers while holding bearing end of screw assembly (14). Screw assembly (14) should travel in and out of housing (10) smoothly with no indication of binding.

CESSNA AIRCRAFT COMPANY
MODEL 421
SERVICE MANUAL



A

0.248 INCH MINIMUM, 0.253 INCH MAXIMUM AIRPLANES C0001 THRU C0600
0.248 INCH MINIMUM, 0.253 INCH MAXIMUM AIRPLANES C0601 THRU C1800
0.247 INCH MINIMUM, 0.248 INCH MAXIMUM AIRPLANES C1801 AND ON

B

0.248 INCH MINIMUM, 0.253 INCH MAXIMUM AIRPLANES C0001 THRU C0600
0.248 INCH MINIMUM, 0.253 INCH MAXIMUM AIRPLANES C0601 THRU C1800
0.310 INCH MINIMUM, 0.311 INCH MAXIMUM AIRPLANES C1801 AND ON

C

0.242 INCH MINIMUM, 0.256 INCH MAXIMUM AIRPLANES C0001 THRU C0600
0.242 INCH MINIMUM, 0.246 INCH MAXIMUM AIRPLANES C0601 THRU C1800
0.308 INCH MINIMUM, 0.309 INCH MAXIMUM AIRPLANES C1801 AND ON

D

0.245 INCH MINIMUM, 0.246 INCH MAXIMUM TYPICAL ALL AIRPLANES

Elevator Trim Tab Actuator Tolerance
Figure 8A

51344004

12. Removal/Installation Elevator Trim Tab Cables (See Figure 7).

NOTE: Refer to Flight Control Maintenance Practices.

A. Remove Elevator Trim Tab Cables.

NOTE: The following procedures describe removal of elevator trim cables from the turnbuckles aft to the trim tab actuator. Refer to Removal/Installation Elevator Trim Control Wheel Assembly.

- (1) Remove cabin furnishings and carpet as required to gain access to floor panels at centerline of aircraft.
- (2) Remove center floor panels, tailcone access, stabilizer fairings, stinger and elevator trim tab actuator access, refer to Chapter 1 for locations.
- (3) Remove elevator trim cable stop blocks and bushings by removing nuts, washers and screws.
- (4) Remove turnbuckle clips and remove turnbuckles from the cables.
- (5) Remove the pressure seals.
- (6) Remove cable pulley guard pins.
- (7) Remove the two pulleys from the upper pulley bracket in the tailcone by removing nuts, washers and bolts.
- (8) Disengage chain from the trim actuator sprocket.
- (9) Attach a guide wire to the chain and remove chain and cables by pulling out through opening in the tailcone.
- (10) Attach guide wires to aft left and right cables. Remove by pulling out through opening in tailcone.

B. Install Elevator Trim Cables.

- (1) Attach chain of trim actuator to guide wire in tailcone and pull chain into position at actuator. Remove guide wire.
- (2) Evenly distribute chain around the sprocket of trim actuator. Install chain guard on actuator with clamp, washers and screws.
- (3) Install cable pulleys in upper pulley bracket, using bolts, washers, nuts and guard pins.
- (4) Attach guide wires to turnbuckle ends of cables in tailcone; pull cables into position and remove guide wires.
- (5) Connect the aft cables to the forward cables, using turnbuckles.
- (6) Install cable guard pins on pulley brackets.
- (7) Install pressure seals as follows:
 - (a) Ensure that cables are lubricated for the full length of travel within the pressure seals.
 - (b) Pack the pressure seals with MIL-G-81322A lubricant.
 - (c) Place pressure seals on cables on non-pressurized side of bulkhead with small end toward bulkhead.
 - (d) Insert pressure seals in bulkhead so that bulkhead metal is seated within the retaining groove.
 - (e) Install proper retaining rings in the grooves of the pressure seals (two on small end and one on large end).
- (8) Install stop blocks and bushings, using screws, washers and nuts. Do not tighten at this time.
- (9) Rig the elevator trim control system, refer to Adjustment/Test.
- (10) Install all floor panels, access covers, fairings and cabin furnishings.

13. Removal/Installation Elevator Trim Control Wheel Assembly and Cables (See Figure 7).

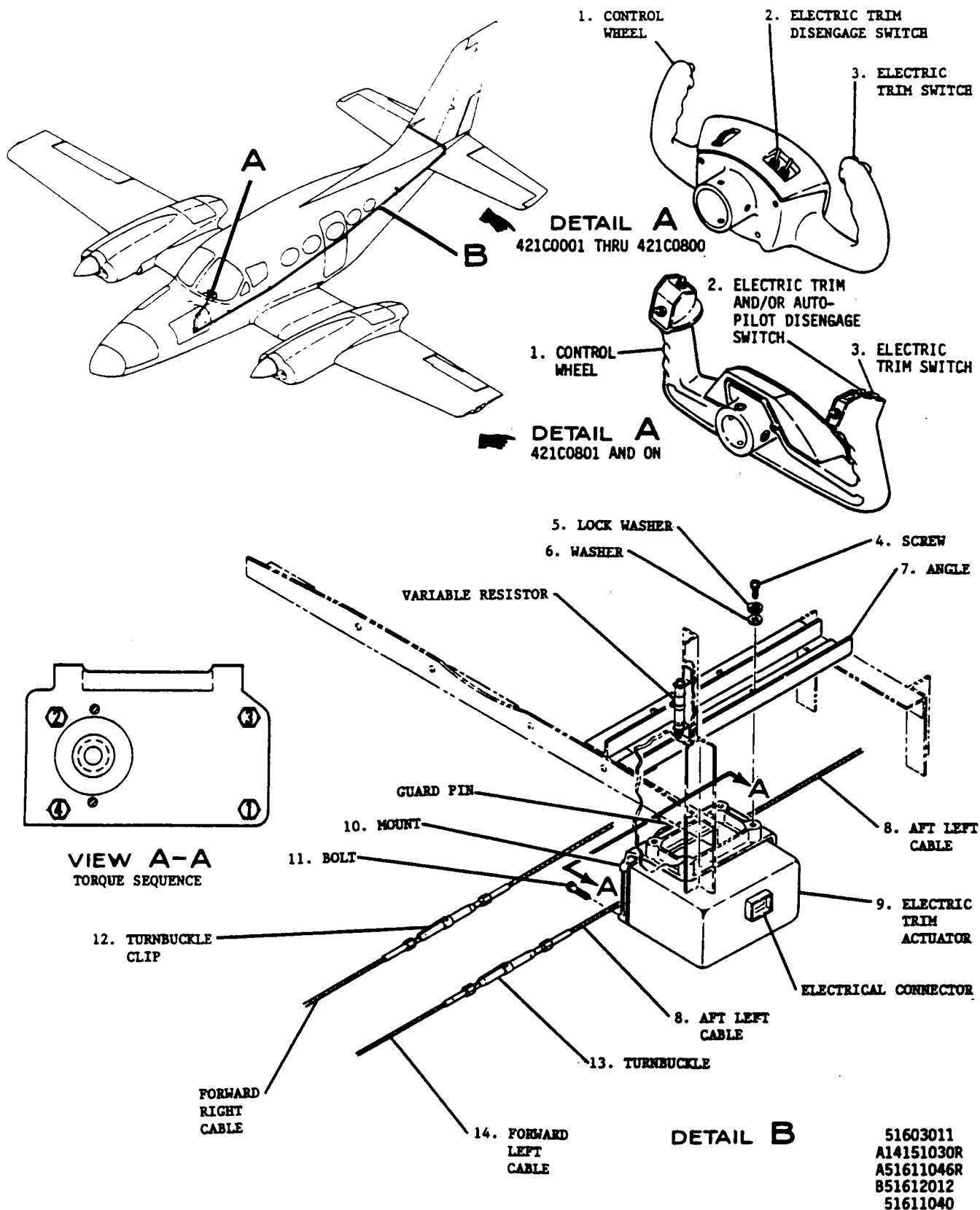
NOTE: Refer to Flight Control Maintenance Practices.

A. Remove Elevator Control Wheel Assembly.

- (1) Remove carpet, center floor panel aft of the pedestal to gain access to cable turnbuckles.
- (2) Remove turnbuckle clips and loosen turnbuckles to release tension on elevator trim control system.
- (3) Remove elevator trim control wheel by removing screws and washers.
- (4) Remove the quadrant cover, right side panel and forward panel from pedestal.

NOTE: To remove the elevator trim indicator, the rivet around which the indicator pivots must be removed.

- (5) Disengage chain from sprocket; remove sprocket from pedestal by removing cotter pin, nut, washer, bearing and bolt.



Electric Elevator Trim Actuator Installation
Figure 9

B. Install Elevator Control Wheel Assembly.

- (1) If indicator was removed, secure to pedestal cover with rivet, washers and spacer.
- (2) Install sprocket, using bolt, bearing, washer, nut and cotter pin.
- (3) Distribute chain around the sprocket evenly.
- (4) Install trim control wheel on the sprocket and secure with washer and screws.
- (5) Rig the trim control system, refer to Adjustment/Test.
- (6) Install turnbuckle clips on the cable turnbuckles.
- (7) Install pedestal access covers, floor panel and carpet.

C. Remove Forward Trim Tab Cables.

NOTE: The following procedures describe removal of elevator trim cables from the turnbuckles forward to the trim tab control wheel sprocket.

- (1) Remove the carpet.
- (2) Remove pedestal forward and right access.
- (3) Remove center floor panel aft of pedestal and cable access on bottom surface of the forward fuselage, refer to Chapter 1 for locations.
- (4) Remove turnbuckle clip and disconnect turnbuckles on left and right forward cables.
- (5) Remove the guard pins from the forward cable pulley brackets.
- (6) Attach guide wires to forward cables at turnbuckle ends and remove by pulling out through opening in pedestal.

D. Install Forward Trim Tab Cables.

- (1) Tie guide wires at pedestal to turnbuckle end of forward cables and pull cables into position.
- (2) Distribute chain evenly around sprocket in the pedestal.
- (3) Remove guide wires and connect turnbuckles to aft left and right cables. Do not tighten turnbuckles.
- (4) Install guard pins in the forward pulley brackets.
- (5) Rig the trim control system, refer to Adjustment/Test.
- (6) Install turnbuckle clips on turnbuckles.
- (7) Install floor panel, pedestal access covers, cable access and carpet.

14. Removal/Installation Electric Elevator Trim Actuator (Optional) (See Figure 9).**A. Remove Electric Trim Actuator.**

- (1) Ensure aircraft's electrical power is OFF.
- (2) Place a suitable support under tailcone.
- (3) Remove tailcone access.
- (4) Disconnect electrical connector from electric elevator trim actuator (9).

NOTE: The electric elevator trim actuator can be removed from the mount without disturbing the elevator trim cable tension.

- (5) Remove electric elevator trim actuator (9) from mount by removing bolts (11).
- (6) If complete trim actuator and mounting removal is desired, proceed as follows:
 - (a) Remove center floor panels as necessary, to gain access to the elevator trim control cable turnbuckles (13).
 - (b) Disconnect turnbuckle (13) from cables (8 and 14).
 - (c) Remove guard pin from mount (10) and unwrap cable (8) from clutch pulley.
 - (d) Remove mount (10) from angles (7) by removing screws (4), lockwasher (5) and washers (6).

B. Install Electric Trim Actuator.

- (1) To install electric elevator trim actuator (9) on mount (10) proceed as follows:
 - (a) Align electric elevator trim actuator (9) to shaft of mount (10).
 - (b) Slide electric elevator trim actuator (9) onto shaft of mount (10).

- (c) Secure electric elevator trim actuator (9) to mount (10) with bolts (11). Torque bolts evenly in a crisscross pattern to 15-20 inch-pounds. Safety wire bolts.
- (2) If complete trim actuator and mounting is being installed, proceed as follows:
 - (a) Install mount (10) under angles (7) using screws (4), lock washers (5) and washers (6).
 - (b) Install electric elevator trim tab cable as follows:
 - 1) Position capstan of mount so that slot of capstan is facing forward and hold in this position using a suitable wrench on shaft of mount.
 - 2) Position and hold elevator trim control wheel and elevator trim tab in the normal full nose down position.
 - 3) With parts held in position, pull slack in LH aft cable forward to actuator.
 - 4) Start on the aft side with the fourth groove in from end of capstan and wrap cable counterclockwise three full turns around capstan with swaged ball of cable positioned in slot on forward side of capstan.
 - 5) Connect turnbuckle (13) to cables (8 and 14).
 - 6) Connect electrical connector to electric elevator trim actuator (9).
- (3) If procedures in Step (1) were used for installation, check for correct trim tab deflection. Refer to Inspection/Check.
- (4) If procedures in Step (2) were used for installation, rig elevator trim control system. Refer to Adjustment/Test.

NOTE: Operate electric elevator trim actuator through entire travel and observe that cable remains in groove and the swaged ball does not move out of the horizontal groove.

- (5) Check electric elevator trim actuation time as follows:
 - (a) Turn elevator trim control wheel so that indicator is at the maximum nose up position.
 - (b) Using a grease pencil or equivalent, make a reference mark on the elevator trim control wheel.

NOTE: Use external power supply and ensure voltage on airplane bus is $27.5 \pm .25$ volts.

- (c) With electrical power on airplane set electrical trim switch to nose down position and check the time in seconds to obtain three revolutions of the elevator trim control wheel. Proper time is 21 ± 2 , -0 seconds.
- (d) Manually turn elevator trim control wheel in the opposite maximum position and repeat Step (c).
- (e) If the time to obtain three revolutions of the elevator trim control wheel is not 21 ± 2 , -0 seconds, adjust the external variable resistor and repeat Steps (c) and (d).
- (f) If by adjusting the external variable resistor it is impossible to obtain proper time, remove the plug button from the actuator and adjust the potentiometer inside the actuator to obtain the specified time.
- (g) Recheck the elevator trim indicator for correct indication in the NOSE UP position, NOSE DOWN position and TAKEOFF position.

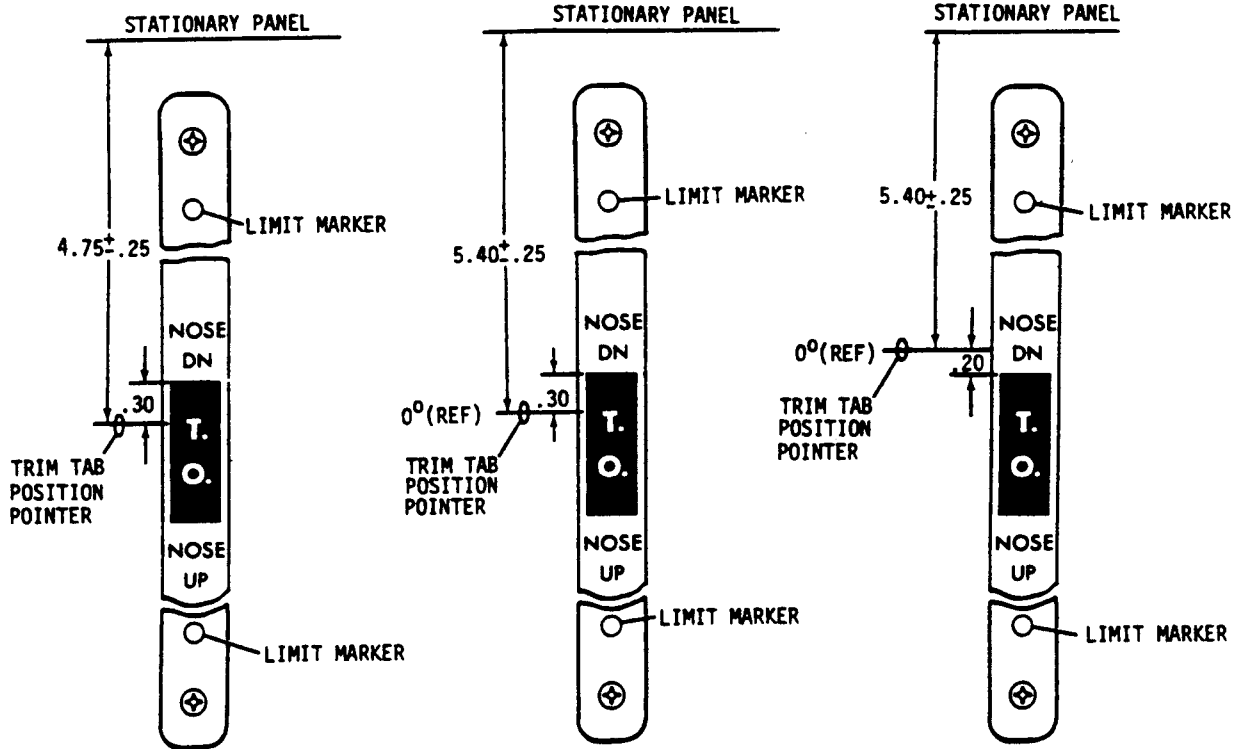
WARNING: INSURE THAT ELEVATOR TRIM TAB MOVES IN THE PROPER DIRECTION WHEN OPERATED BY THE ELEVATOR TRIM CONTROL WHEEL AND THE ELECTRIC TRIM SWITCH.

- (6) Install all floor panels removed and install tailcone access panel.

15. Removal/Installation Elevator Trim Tab Position Marker.

A. Remove Elevator Trim Tab Position Marker.

- (1) Pry out marker indicating pointer travel limits.
- (2) Remove screws at each end of placard.
- (3) Remove placard from pedestal.



421C0001 THRU 421C0600

Elevator Tab Position Marker
Figure 10.

421C0601 THRU 421C0800

Elevator Tab Position Marker
Figure 11.

421C0801 AND ON

Elevator Tab Position Marker
Figure 12.

5100180

- B. Install Elevator Trim Tab Position Marker.
 - (1) Place placard on pedestal.
 - (2) Install screws at each end of placard and limit markers in holes they were removed from.
- C. If a new placard is installed use old placard as template for drilling holes in new placard (See Figure 10, 11 or 12 for dimensions).
- D. If a New Pedestal Cover is Installed (See Figure 9, 10, 11 or 12).
 - (1) Set elevator tab at neutral (0°) and adjust pointer (if necessary) to limits.
 - (2) Locate placard as shown. Install screws and trim ends as required.
 - (3) Rotate trim wheel to limits (full up, full down) and locator markers.