

SECTION 8

ELEVATOR CONTROL SYSTEM

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8-1. ELEVATOR CONTROL SYSTEM.

8-2. DESCRIPTION. The elevators are operated by power transmitted through forward and aft movement of the control "U". This power reaches the elevators through a system consisting of a push-pull tube, cables and bellcranks. The elevator control

cables, at their aft ends, are attached directly to a bellcrank, installed between the elevators. This bellcrank serves as an interconnect between the elevators and as a bearing point for the travel stop bolts. A trim tab is installed on the right elevator and is described in Section 9.

8-3. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 8-14.

TROUBLE	PROBABLE CAUSE	REMEDY
NO RESPONSE TO CONTROL WHEEL FORE-AND-AFT MOVEMENT.	Forward or aft end of push-pull tube disconnected.	Check visually and attach push-pull tube correctly.
	Cables disconnected.	Check visually, attach cables and rig system in accordance with paragraph 8-14.

8-3. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
BINDING OR JUMPY MOTION FELT IN MOVEMENT OF ELEVATOR SYSTEM.	Defective forward or rear bellcrank or bellcrank pivot bearing.	Move to check for play or binding. Replace bellcranks found defective.
	Cables slack.	Check tension and adjust to tension specified in figure 8-1.
	Cables not riding correctly on pulleys.	Open access plates and observe pulleys. Route cables correctly over pulleys.
	Nylon bearing on instrument panel binding.	Disconnect universal joint and check for binding. Replace bearing if binding is felt.
	Defective control "U" pivot bearing.	Disconnect elevator push-pull tube at lower end of "U" and check that control moves freely. Replace bearing if defective.
	Defective elevator hinges.	Move elevators by hand, checking hinges. Replace hinges found defective.
	Lubrication needed.	Lubricate in accordance with Section 2.
	Clevis bolts too tight.	Check and readjust bolts to eliminate binding.
	Defective pulleys or cable guards.	Open access plates and check visually. Replace defective parts and install guards properly.
ELEVATORS FAIL TO ATTAIN PRESCRIBED TRAVEL.	Stops incorrectly set.	Check elevator travel with inclinometer. Rig in accordance with paragraph 8-14.
	Cables tightened unevenly.	Rig in accordance with paragraph 8-14.
	Interference at instrument panel.	Rig in accordance with paragraph 8-14.

8-4. ELEVATORS. (Refer to figure 8-2.)

b. Remove bolts (6) securing elevators to bellcrank (9).

8-5. REMOVAL AND INSTALLATION.

NOTE

NOTE

This procedure is written primarily for the right elevator since the trim tab is attached to this elevator.

If trim system is not moved and actuator screw is not turned, rigging of trim system should not be necessary after installation of elevator.

a. Disconnect trim tab push-pull channel (3) at tab actuator.

c. Remove bolts (11) from elevator hinges.
d. Using care, remove elevator.

1. Pulley
2. Bolt
3. Rear Up Cable
4. Jam Nut
5. Elevator Stop
6. Rear Down Cable
7. Rear Bellcrank
8. Forward Up Cable
9. Forward Down Cable
10. Push-Pull Tube
11. Forward Bellcrank
12. Bracket
13. Turnbuckle

NOTE

Install upper bolt (2) with head on right and lower bolt with head on left of bellcrank (7). Safety wire elevator travel stop bolt (5) beginning with aircraft serials 17259716 & F17200835.

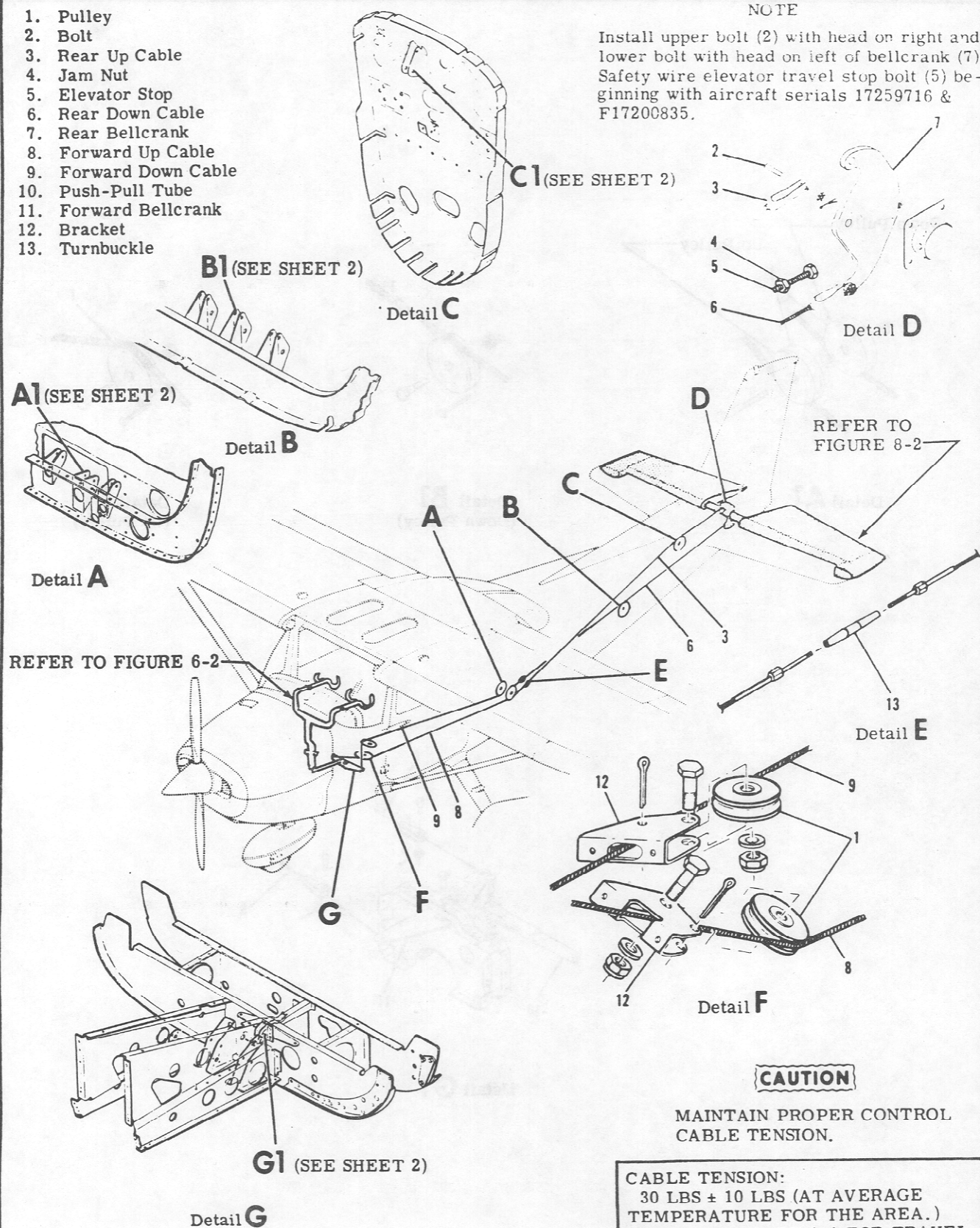
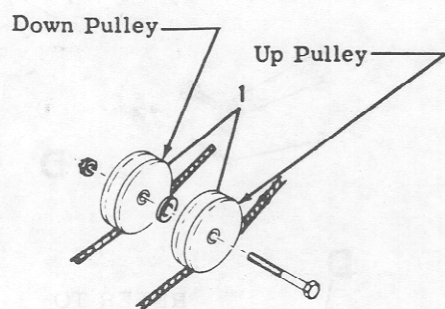
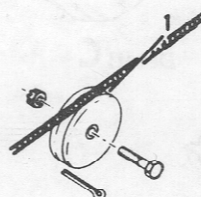


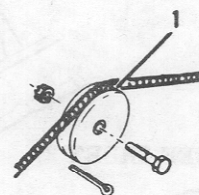
Figure 8-1. Elevator Control System (Sheet 1 of 2)



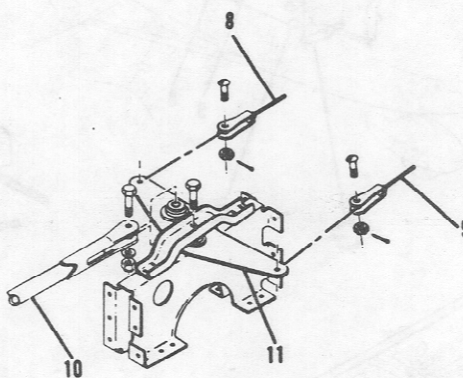
Detail **A1**



Detail **B1**
(Down Pulley)



Detail **C1**
(Up Pulley)



Detail **G1**

*Castellated nuts and pins beginning
with aircraft serials 17259107 and
F172 00730

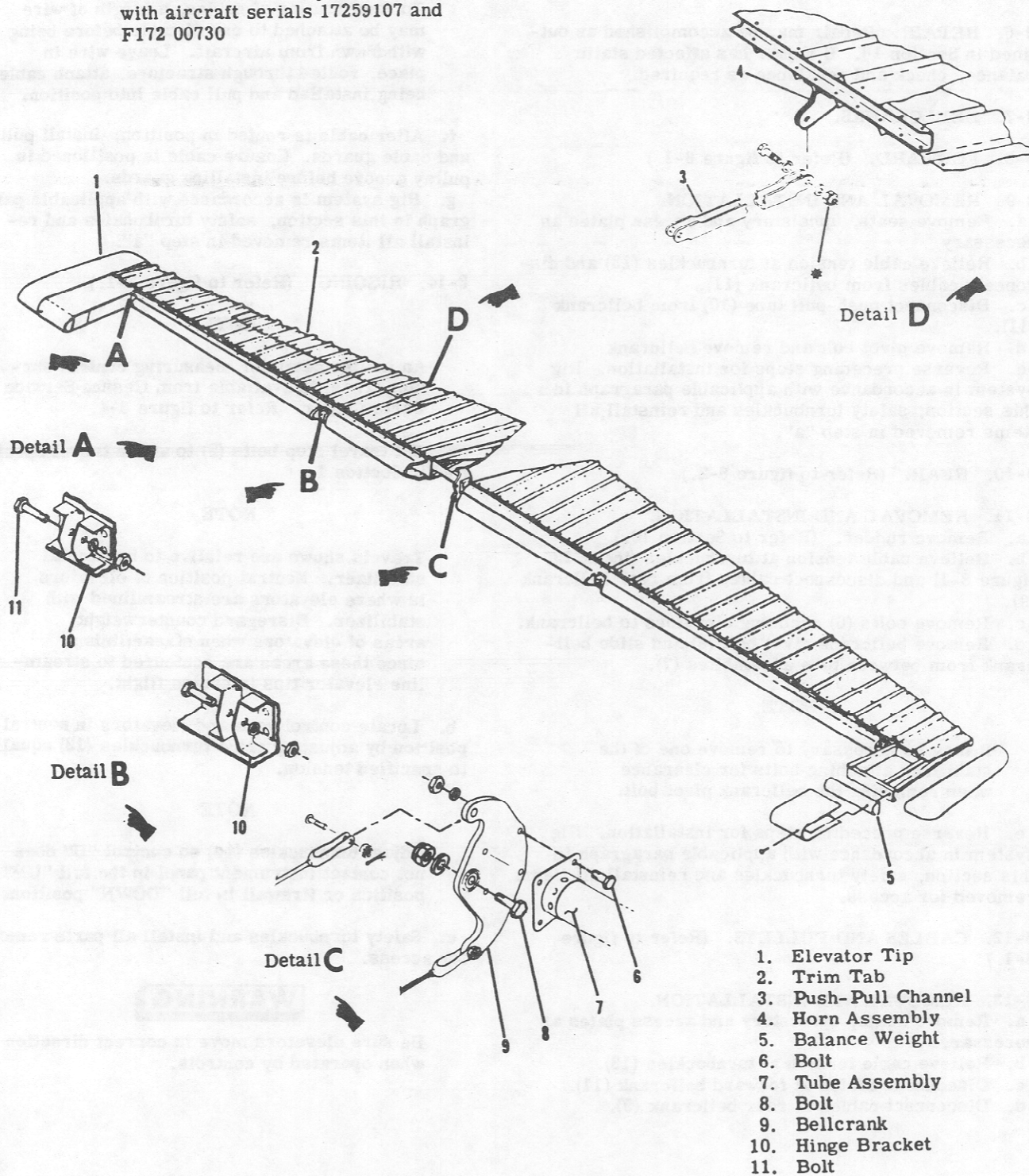


Figure 8-2. Elevator Installation

e. To remove left elevator use same procedure, omitting step "a".

f. Reverse preceding steps for installation. Rig system in accordance with applicable paragraph in this section if necessary.

8-6. REPAIR. Repair may be accomplished as outlined in Section 18. If repair has affected static balance, check and rebalance as required.

8-7. BELLCRANKS.

8-8. FORWARD. (Refer to figure 8-1.)

8-9. REMOVAL AND INSTALLATION.

a. Remove seats, upholstery and access plates as necessary.

b. Relieve cable tension at turnbuckles (13) and disconnect cables from bellcrank (11).

c. Disconnect push-pull tube (10) from bellcrank (11).

d. Remove pivot bolt and remove bellcrank.

e. Reverse preceding steps for installation. Rig system in accordance with applicable paragraph in this section, safety turnbuckles and reinstall all items removed in step "a".

8-10. REAR. (Refer to figure 8-2.)

8-11. REMOVAL AND INSTALLATION.

a. Remove rudder. (Refer to Section 10.)

b. Relieve cable tension at turnbuckles (index 13, figure 8-1) and disconnect cables from rear bellcrank (9).

c. Remove bolts (6) securing elevators to bellcrank.

d. Remove bellcrank pivot bolt (8) and slide bellcrank from between tube assemblies (7).

NOTE

It may be necessary to remove one of the stabilizer attaching bolts for clearance when removing the bellcrank pivot bolt.

e. Reverse preceding steps for installation. Rig system in accordance with applicable paragraph in this section, safety turnbuckles and reinstall all items removed for access.

8-12. CABLES AND PULLEYS. (Refer to figure 8-1.)

8-13. REMOVAL AND INSTALLATION.

a. Remove seats, upholstery and access plates as necessary.

b. Relieve cable tension at turnbuckles (13).

c. Disconnect cables at forward bellcrank (11).

d. Disconnect cables at rear bellcrank (9).

e. Remove cable guards and pulleys as necessary to work cables free of aircraft.

NOTE

To ease routing of cables, a length of wire may be attached to end of cable before being withdrawn from aircraft. Leave wire in place, routed through structure, attach cable being installed and pull cable into position.

f. After cable is routed in position, install pulleys and cable guards. Ensure cable is positioned in pulley groove before installing guards.

g. Rig system in accordance with applicable paragraph in this section, safety turnbuckles and reinstall all items removed in step "a".

8-14. RIGGING. (Refer to figure 8-1.)

NOTE

An inclinometer for measuring control surface travel is available from Cessna Service Parts Center. Refer to figure 6-4.

a. Set travel stop bolts (5) to attain travel specified in Section 1.

NOTE

Travels shown are relative to horizontal stabilizer. Neutral position of elevators is where elevators are streamlined with stabilizer. Disregard counterweight areas of elevators when streamlining since these areas are contoured to streamline elevator tips in cruise flight.

b. Locate control yoke and elevators in neutral position by adjusting cable turnbuckles (13) equally to specified tension.

NOTE

Adjust turnbuckles (13) so control "U" does not contact instrument panel in the full "UP" position or firewall in full "DOWN" position.

c. Safety turnbuckles and install all parts removed for access.

WARNING

Be sure elevators move in correct direction when operated by controls.