

SECTION 10

RUDDER CONTROL SYSTEM

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10-1. RUDDER CONTROL SYSTEM. (Refer to figure 10-1.)

control nose wheel steering. The system is comprised of rudder pedals, cables and pulleys, all of which link the pedals to the rudder and nose wheel steering.

10-2. DESCRIPTION. Rudder control is maintained through use of conventional rudder pedals which also

10-3. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 10-11.

TROUBLE	PROBABLE CAUSE	REMEDY
RUDDER DOES NOT RESPOND TO PEDAL MOVEMENT.	Broken or disconnected cables.	Connect or replace cables.
BINDING OR JUMPY MOVEMENT OF RUDDER PEDALS.	Cables too tight.	Adjust cable tension in accordance with paragraph 10-11.
	Cables not riding properly on pulleys.	Route cables correctly over pulleys.
	Binding, broken or defective pulleys or cable guards.	Replace defective pulleys and install guards properly.
	Pedal bars need lubrication.	Refer to Section 2.
	Defective rudder bar bearings.	Replace bearing blocks.
	Defective rudder hinge bushings or bellcrank bushings.	Replace defective bushings.
	Clevis bolts too tight.	Readjust to eliminate binding.
	Steering rods not adjusted properly.	Rig system in accordance with paragraph 10-11.
LOST MOTION BETWEEN RUDDER PEDALS AND RUDDER.	Insufficient cable tension.	Adjust cable tension in accordance with paragraph 10-11.
INCORRECT RUDDER TRAVEL.	Incorrect rigging.	Rig system in accordance with paragraph 10-11.

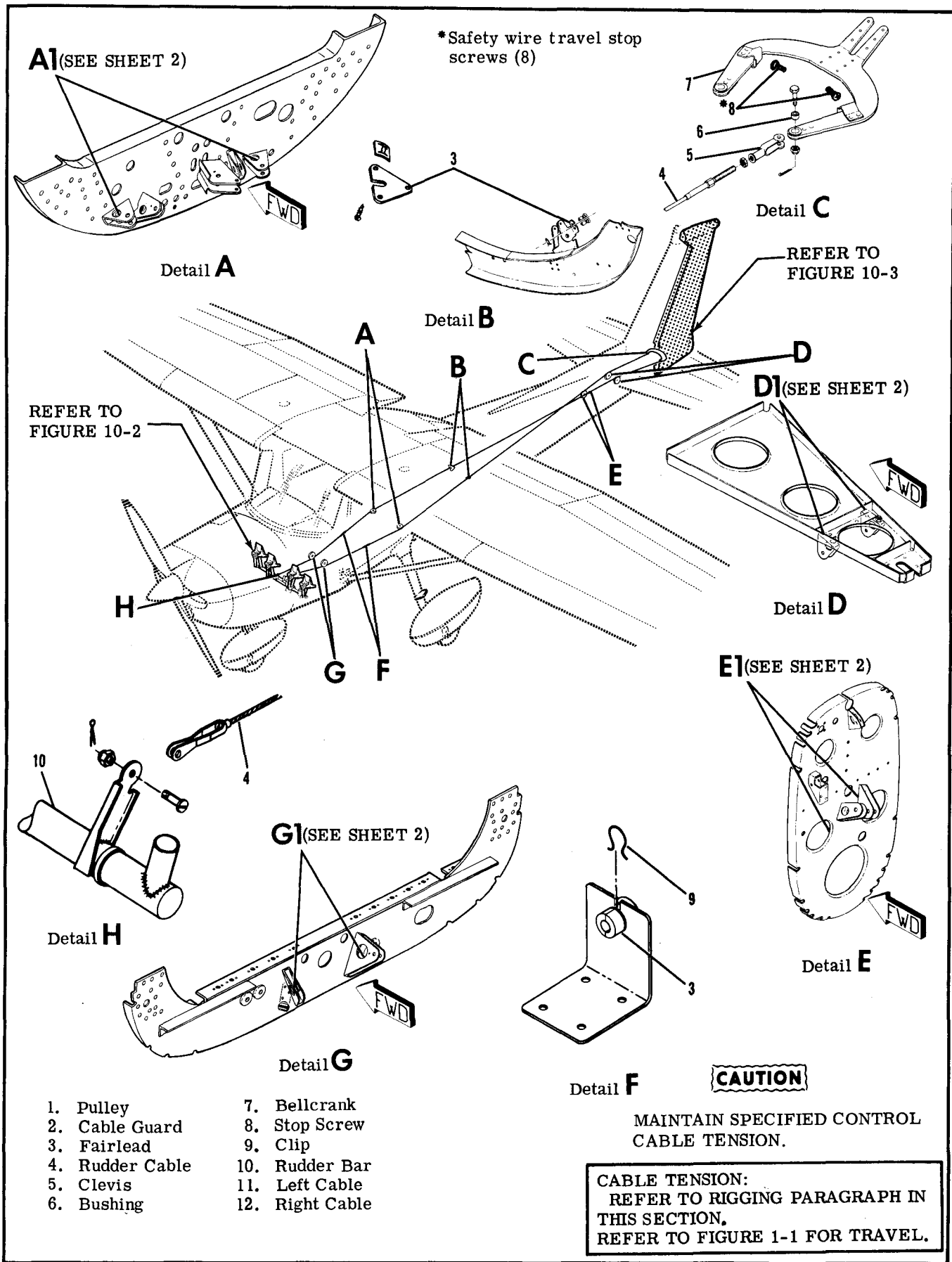
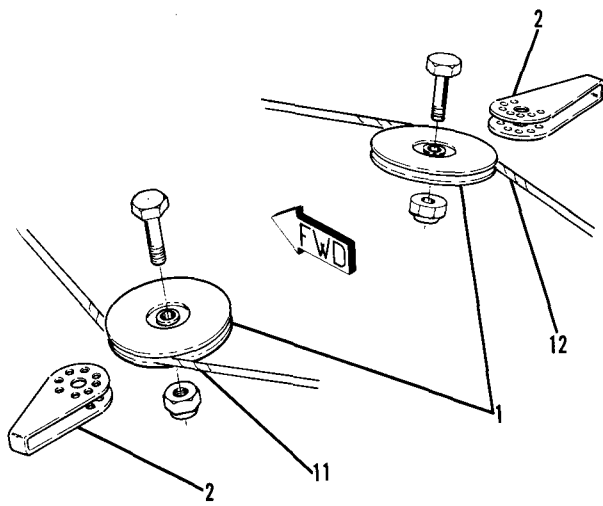
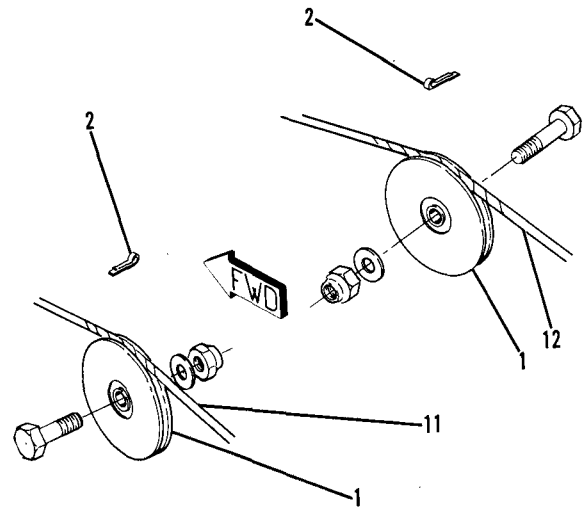


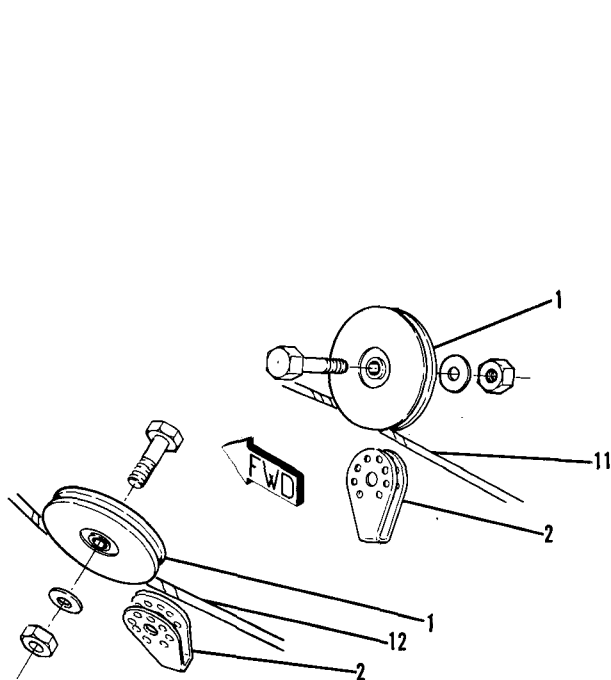
Figure 10-1. Rudder Control System (Sheet 1 of 2)



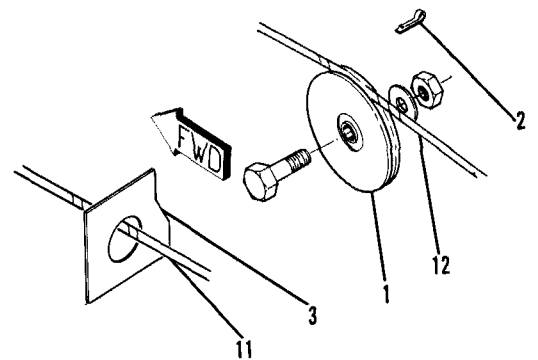
Detail **A1**



Detail **D1**



Detail **G1**



Detail **E1**

Figure 10-1. Rudder Control System (Sheet 2 of 2)

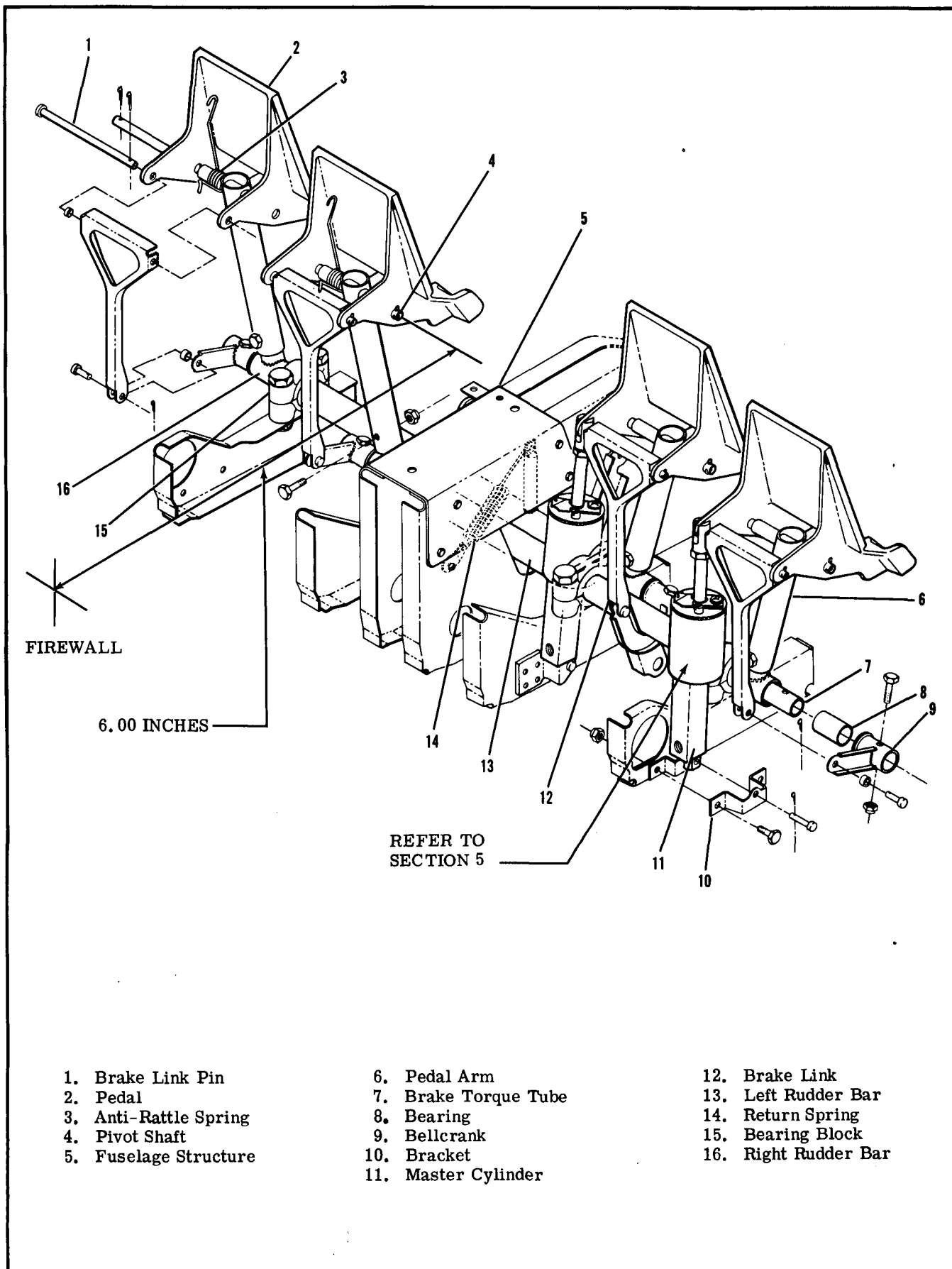


Figure 10-2. Rudder Pedals Installation

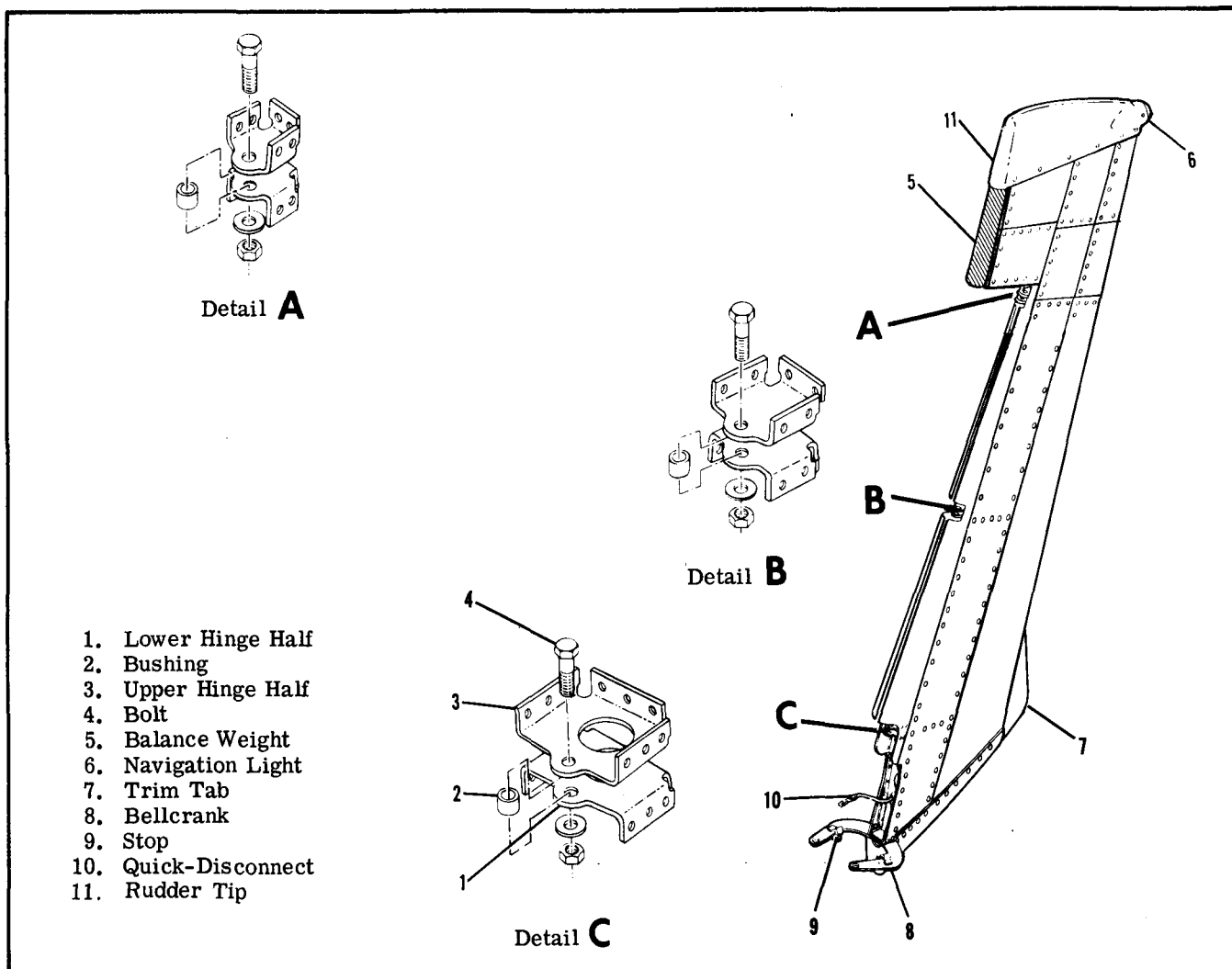


Figure 10-3. Rudder Installation

10-4. RUDDER PEDAL ASSEMBLY. (Refer to figure 10-2.)

10-5. REMOVAL AND INSTALLATION.

- a. Remove carpeting, shields and soundproofing from pedal and tunnel areas as necessary.
- b. Disconnect master cylinders (11) at pilot rudder pedals.
- c. Disconnect parking brake cables at master cylinders.
- d. Remove rudder pedals (2) and brake links (12).
- e. Relieve cable tension at clevises (index 5, figure 10-1).
- f. Disconnect cables, return springs and steering tubes from rudder bars.
- g. Remove bolts securing bearing blocks (15) and work rudder bars out of tunnel area.

NOTE

Rudder bar assemblies should be checked for excessive wear before installation. The bearing blocks are nylon and require no lubrication unless binding occurs. A few

drops of general purpose oil should eliminate such binding.

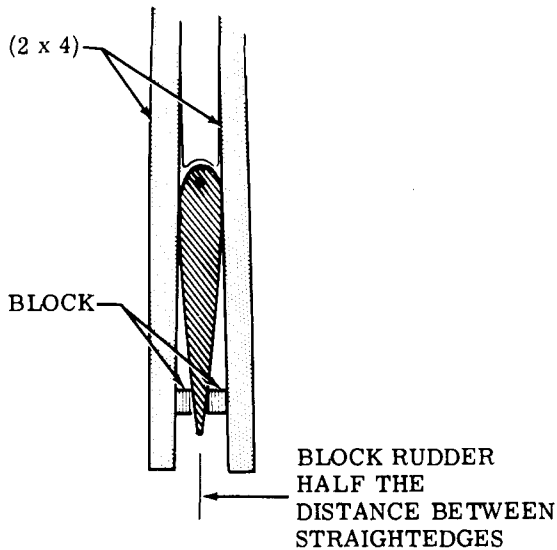
- h. Reverse preceding steps for installation. Rig system in accordance with applicable paragraph in this section, safety clevises and reinstall all items removed in step "a".

10-6. RUDDER. (Refer to figure 10-3.)

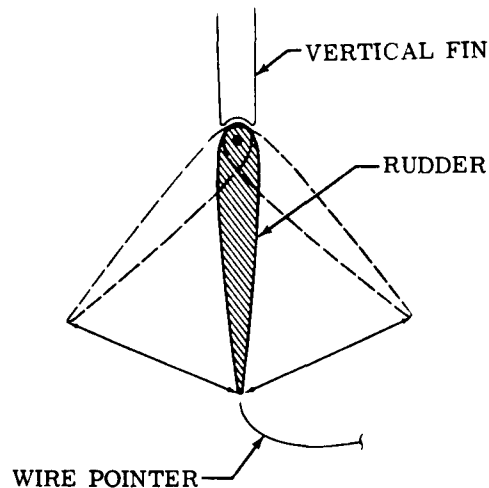
10-7. REMOVAL AND INSTALLATION.

- a. Disconnect tail navigation light quick-disconnect (10).
- b. Relieve cable tension at clevises (index 5, figure 10-1) and disconnect clevises from rudder bellcrank (8).
- c. With rudder supported, remove hinge bolts (4) and lift rudder free of vertical fin.
- d. Reverse preceding steps for installation. Rig system in accordance with applicable paragraph in this section and safety clevises.

10-8. REPAIR. Repair may be accomplished as outlined in Section 18. Hinge bushings may be replaced as necessary.



ESTABLISHING NEUTRAL POSITION OF RUDDER



MEASURING RUDDER TRAVEL

1. Establish neutral position of rudder by clamping straightedge (such as wooden 2 X 4) on each side of fin and rudder and blocking trailing edge of rudder half the distance between straightedges as shown.
2. Tape a length of soft wire to one elevator in such a manner that it can be bent to index with a point on rudder trailing edge just above the lower rudder tip (rudder butt).
3. Using soft lead pencil, mark rudder at point corresponding to soft wire indexing point (neutral).
4. Remove straightedges.
5. Hold rudder against right, then left, rudder stop. Measure distance from pointer to pencil mark on rudder in each direction of travel. Distance should be between 6.04" and 6.60".

Figure 10-4. Checking Rudder Travel

10-9. CABLES AND PULLEYS. (Refer to figure 10-1.)

10-10. REMOVAL AND INSTALLATION.

- a. Remove seats, upholstery and access plates as necessary.
- b. Disconnect cable at rudder bar (10) and bellcrank (7).
- c. Remove cable guards, pulleys and fairleads 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.

- d. After cable is routed in position, install pulleys fairleads and cable guards. Ensure cable is positioned in pulley groove before installing guard.
- e. Rig system in accordance with applicable para-

graph in this section, safety clevises and reinstall all items removed in step "a".

10-11. RIGGING. (Refer to figure 10-1.)

- a. Adjust travel stops (8) to attain travel specified in Section 1. Figure 10-4 illustrates correct travel and one method of checking.
- b. Disconnect nose wheel steering tubes (index 6, figure 5-6) from nose strut.
- c. Adjust cables at clevises (5) to align rudder and pedals in neutral position, 6.00 inches from firewall and pedal pivot shafts (index 4, figure 10-2). This step automatically determines cable tension through use of return springs (14).

NOTE

Due to thickness of insulation on firewall, it is recommended that a piece of 1/16 inch welding rod be ground to a sharp point and notched at the 6.00 inch dimension. Pierce insulation on firewall and use notch to measure proper dimension.

