

SECTION 6

AILERON CONTROL SYSTEM

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6-1. AILERON CONTROL SYSTEM. (Refer to figure 6-1.)

pulleys, sprockets and roller chains, all of which, link the control wheels to the ailerons. A control "Y" interconnects the control wheels to the aileron cables.

6-2. DESCRIPTION. The aileron control system is comprised of push-pull rods, bellcranks, cables,

6-3. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 6-15.

TROUBLE	PROBABLE CAUSE	REMEDY
LOST MOTION IN CONTROL WHEELS.	Loose control cables.	Adjust cables to proper tension.
	Broken pulley or bracket, cable off pulley or worn rod end bearings.	Replace worn or broken parts, install cables correctly.
	Sprung bellcrank.	Replace bellcrank.
	Loose chains.	Adjust chain tension.

6-3. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
RESISTANCE TO CONTROL WHEEL MOVEMENT.	Cables too tight.	Adjust cables to proper tension.
	Pulleys binding or cable off.	Replace defective pulleys. Install cables correctly.
	Bellcrank distorted or damaged.	Replace bellcrank.
	Defective U-joints.	Replace defective U-joints.
	Clevis bolts in system too tight.	Loosen, then tighten properly and safety.
	Rusty chain or chain binding with sprocket.	Replace chain or defective parts.
CONTROL WHEELS NOT LEVEL WITH AILERONS NEUTRAL.	Improper adjustment of chains or cables.	Adjust in accordance with paragraph 6-15.
	Improper adjustment of aileron push-pull rods.	Adjust in accordance with paragraph 6-15.
DUAL CONTROL WHEELS NOT COORDINATED.	Chains improperly adjusted.	Adjust in accordance with paragraph 6-15.
INCORRECT AILERON TRAVEL.	Push-pull rods not adjusted properly.	Adjust in accordance with paragraph 6-15.
	Worn bellcrank stop bushings on bellcrank slots.	Replace worn parts.

6-4. CONTROL "Y". (Refer to figure 6-2.)

6-5. DESCRIPTION. The control "Y" transforms rotation of the control wheels into pulling motion on the aileron cables by means of sprockets and chains. The "Y" is pivoted at the lower end to operate the elevator control system.

6-6. REMOVAL AND INSTALLATION.

a. Remove control cover and carpeting as necessary to gain access to lower end of control "Y".

b. Release cable tension by loosening turnbuckle (index 3, figure 6-1).

c. Remove bolt (17) attaching control link (14).

d. Remove bolts (8) securing control wheel tubes (9) to universal joints (7).

e. Remove bolts securing cable ends to control arm (5).

f. Remove pivot bolt (16) and remove control "Y".

g. Reverse preceding steps for installation.

h. Rig aileron system in accordance with applicable paragraph in this section, safety turnbuckle and re-install all items removed in step "a".

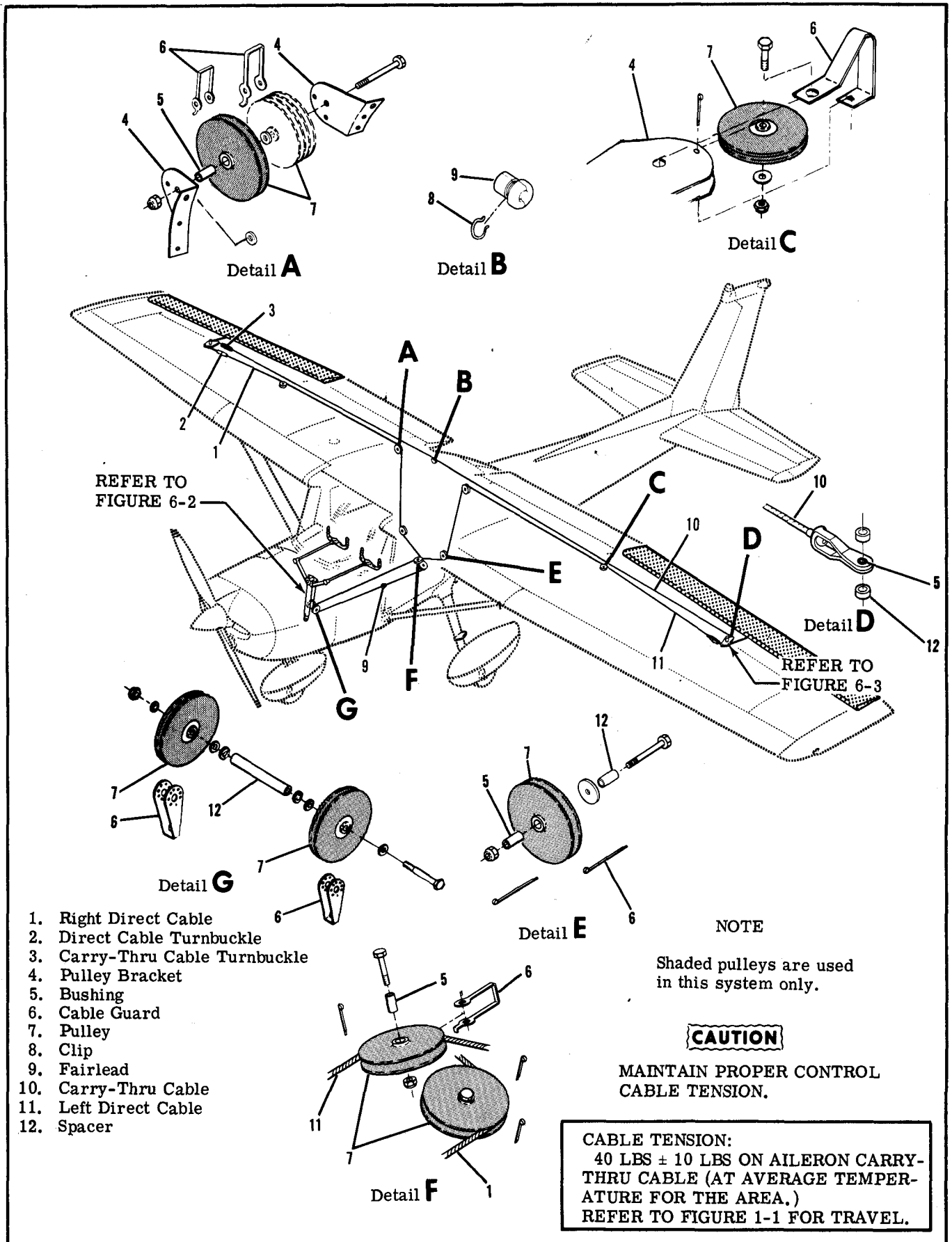
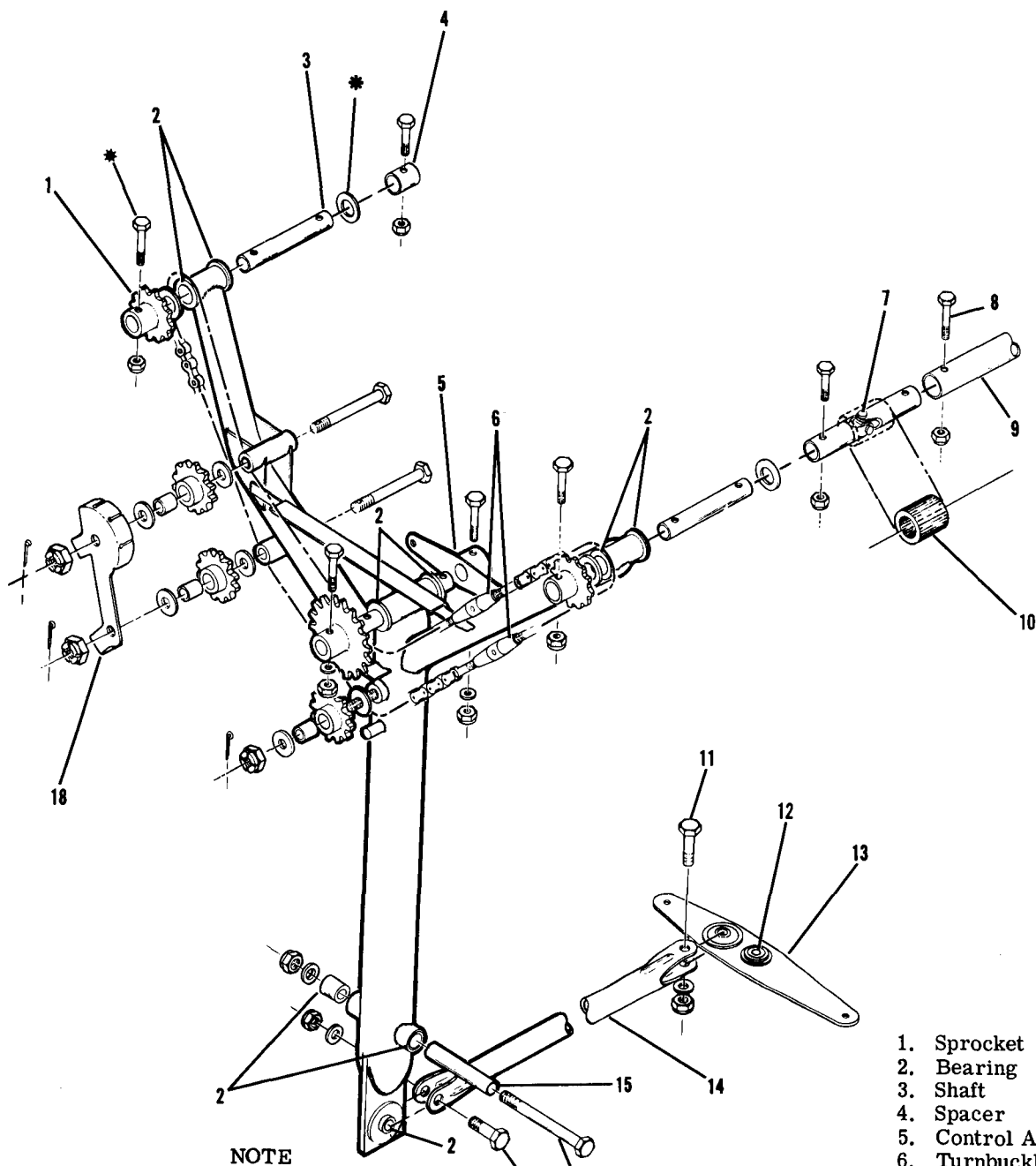


Figure 6-1. Aileron Control System



NOTE

When dual controls are installed, spacer (4) is replaced with a universal joint to which the right control wheel is attached.

Chains are to have minimum amount of tension which will remove slack from chains.

* Use as required for maximum .005 inch end play per side.

* Left and right bolts are to be parallel.

- 1. Sprocket
- 2. Bearing
- 3. Shaft
- 4. Spacer
- 5. Control Arm
- 6. Turnbuckle
- 7. Universal Joint
- 8. Bolt
- 9. Control Wheel Tube
- 10. Cover
- 11. Bolt
- 12. Bearing
- 13. Bellcrank
- 14. Control Link
- 15. Bushing
- 16. Pivot Bolt
- 17. Bolt
- 18. Chain Guard

Figure 6-2. Control "Y" Installation

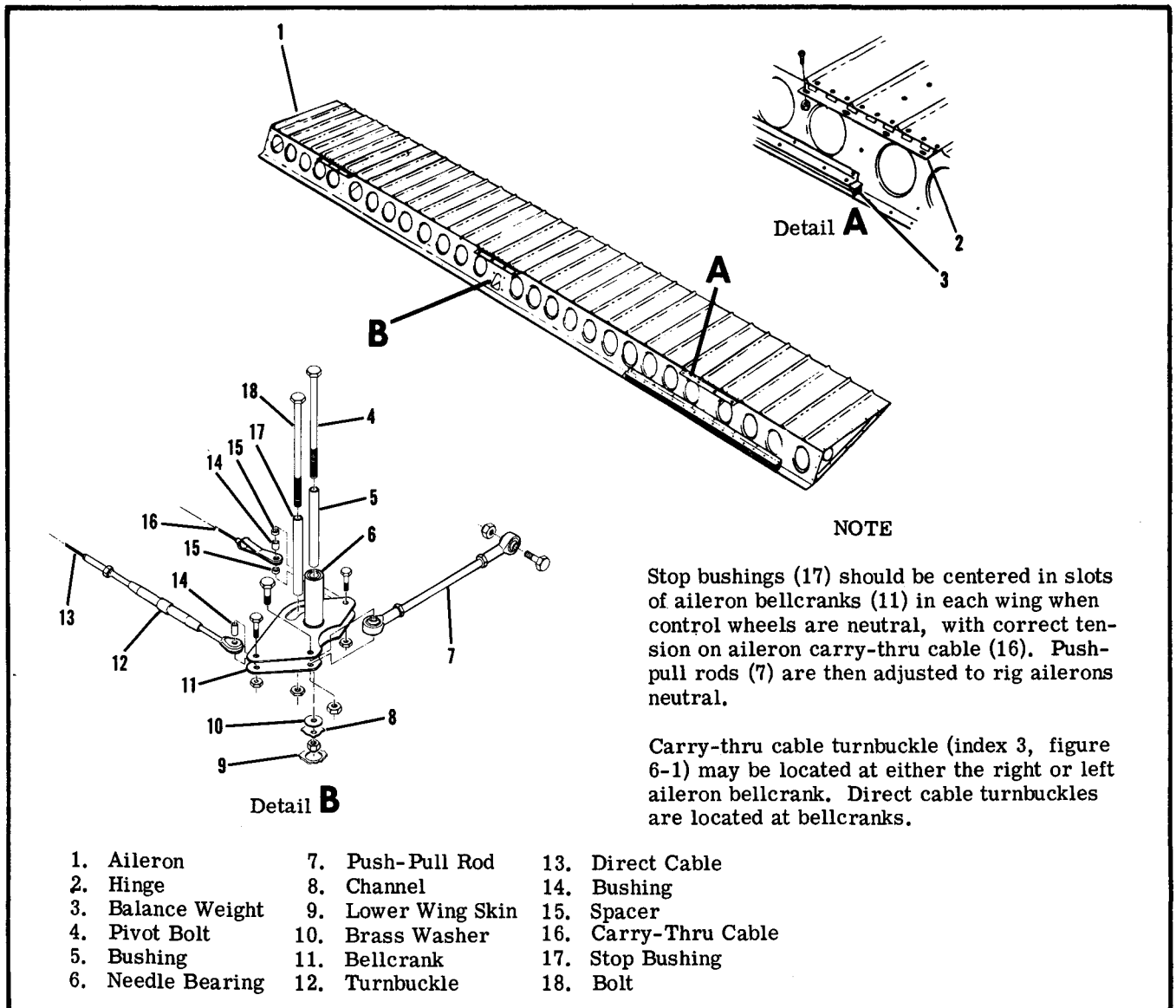


Figure 6-3. Aileron and Bellcrank Installation

i. Check and/or rig elevator control system in accordance with applicable paragraph in Section 8.

6-7. AILERON BELLCRANK. (Refer to figure 6-3.)

6-8. REMOVAL.

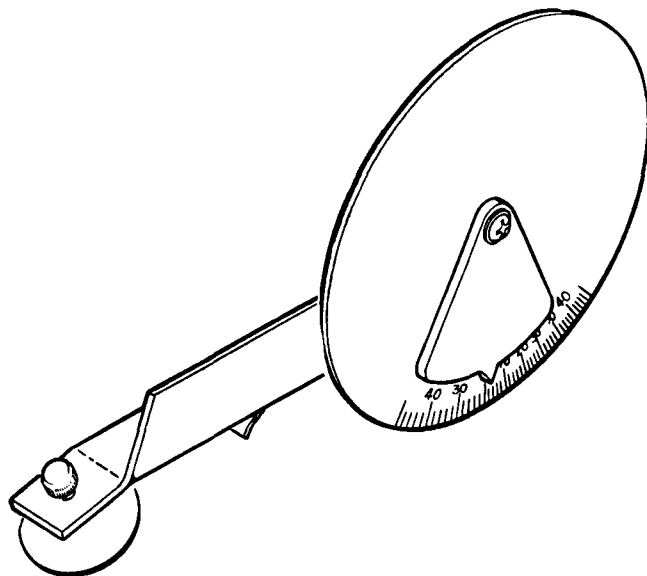
- a. Remove access plate inboard of each bellcrank on underside of wing.
- b. Relieve control cable tension by loosening turnbuckle barrel (index 3, figure 6-1).
- c. Disconnect control cables from bellcrank. Retain all spacers (15).
- d. Disconnect aileron push-pull rod (7) at bellcrank.
- e. Remove nut, washer and bolt securing bellcrank stop bushing (17) and bellcrank (11) to wing structure.
- f. Remove bellcrank through access opening, using care bushing (5) is not dropped from bellcrank.

NOTE

Brass washers (10) may be used as shims between lower end of bellcrank and wing channel (8). Retain these shims. Tape open ends of bellcrank to prevent dust and dirt from entering bellcrank needle bearings (6).

6-9. INSTALLATION.

- a. Place bushing (5) and stop-bushing (17) in bellcrank and position bellcrank in wing.
- b. Install brass washers (10) between lower end of bellcrank and wing channel (8) to shim out excess clearance.
- c. Install bellcrank pivot bolt (4), washers and nut.
- d. Position bellcrank stop-bushing (17) and install attaching bolt (18), washers and nut.



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Figure 6-4. Inclinometer for Measuring Control Surface Travel

- e. Connect aileron cables to bellcrank.
- f. Rig aileron system in accordance with applicable paragraph in this section, safety turnbuckle and install access plates.

6-10. CABLES AND PULLEYS. (Refer to figure 6-1.)

6-11. REMOVAL AND INSTALLATION.

- a. Remove access plates, wing root fairings and upholstery as required.
- b. Disconnect cables from aileron bellcranks and 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; then attach to cable being installed and use to pull cable into position.

- c. After cable is routed, install pulleys and cable guards. Ensure cable is positioned in pulley groove before installing guard.
- d. Rig aileron system in accordance with applicable paragraph in this section, safety turnbuckles and install access plates, fairings and upholstery removed in step "a."

6-12. AILERONS. (Refer to figure 6-3.)

6-13. REMOVAL.

- a. Disconnect push-pull rod (7) at aileron.

- b. Remove screws and nuts attaching aileron hinges (2) to trailing edge of wing.
- c. Using care, pull aileron out and down to slide hinges from under wing skin and auxiliary spar reinforcements.

6-14. INSTALLATION.

- a. Position aileron hinges between skin and auxiliary spar reinforcements and install screws and nuts attaching hinges to trailing edge of wing.
- b. Attach push-pull rod to aileron.

NOTE

If rigging was correct and push-pull rod adjustment was not disturbed, it should not be necessary to rig system.

- c. Check aileron travel and alignment, rig if necessary, in accordance with applicable paragraph in this section.

6-15. RIGGING.

- a. (Refer to figure 6-2.) Position arm (5) horizontal and install chain with an equal number of links extending from central drive sprocket on arm (5).
- b. Adjust turnbuckles (6) to remove slack from chain and synchronize control wheels (level).

NOTE

Adjust chain turnbuckles (6) to minimum tension required to remove slack.

- c. Tape a bar across both control wheels to hold them in neutral position.

