SECTION 7

WING FLAP CONTROL SYSTEM

TABLE OF CONTENTS

7-1. WING FLAP CONTROL SYSTEM. (Refer to figure 7-1.)

7-2. DESCRIPTION.

a. THRU AIRCRAFT SERIAL 337-0239 WHEN NOT MODIFIED IN ACCORDANCE WITH SK337-19. (Refer to figure 7-2, sheet 1.) The wing flap control system consists of an electric motor, transmission and actuator assembly, three interconnected bellcranks in each wing, synchronizing push-pull tubes, push-pull rods, control cables, pulleys, a down-limit switch located in the wing and a control switch mounted in the instrument panel. The transmission converts the rotary motion of the motor to the push-pull motion needed to operate the flaps and will freewheel at each end of its stroke, but a down-limit switch opens the motor circuit just before free-wheeling occurs in the down position. Overrunning at intermediate flap settings is minimized by a solenoid-released brake at the flap motor. A three-position, momentary-on switch, spring-loaded to the center OFF position, operates the flap control system. The position indicator is operated electrically by a transmitter which is linked mechanically to the left inboard flap bellcrank.

b. BEGINNING WITH AIRCRAFT SERIALS 337-0240 AND F33700001. (Refer to figure 7-2, sheet 2.) The wing flap control system consists of an electric motor, transmission and actuator assembly, three interconnected bellcranks in each wing, synchronizing push-pull tubes, push-pull rods, control cables, pulleys and a follow-up control. The transmission converts the rotary motion of the motor to the push-pull motion needed to operate the flaps and will NOT freewheel at each end of its stroke, the limit switches (2 and 26) MUST be adjusted properly to stop the motor at the flap travel extremes or structural damage will result. Electrical power to the motor is controlled by two microswitches mounted on a "floating" arm. The position indicator is mechanically linked to the actuator and "floating" arm by the follow-up control. (Refer to figure 7-3.) Switches (9 and 10) at the instrument panel actuate the system and control all mid-range flap settings while the limit switches on the actuator de-actuate the system at either travel extreme. As the control lever (5) is lowered to the desired flap setting, cam (6) contacts microswitch (9) actuating the motor. As the flaps move down, the follow-up control (4) pivots arm (2) until microswitch (9) clears cam (6) breaking the circuit. As the control lever (5) is raised, cam (6) contacts microswitch (10) actuating the motor in the reverse direction, raising the flaps in a similar manner. Refer to Section 8 for the flap/elevator trim interconnect system.

c. THRU AIRCRAFT SERIAL 337-0239 WHEN MODIFIED IN ACCORDANCE WITH SK337-19. (Refer to figure 7-1, sheet 2.) This wing flap control system consists of the motor, transmission, actuator and limit switches described in subparagraph "b" utilizing the three-position switch and transmitting system described in subparagraph "a."

7-3. OPERATIONAL CHECK.

a. Operate flaps through their full range of travel observing for uneven or jumpy motion, binding and lost motion in system. Ensure all flaps move simultaneously through their full range of travel.

b. THRU AIRCRAFT SERIAL 337-0239 WHEN NOT MODIFIED IN ACCORDANCE WITH SK337-19. Run flaps to full down position until down-limit switch breaks circuit, then run flaps full up and overrun motor to check that transmission freewheeling occurs in UP position only.

c. BEGINNING WITH AIRCRAFT SERIALS 337-0240, F33700001 AND ALL AIRCRAFT MODIFIED IN ACCORDANCE WITH SK337-19. Check for positive shut-off of motor at flap travel extremes. FLAP MOTOR MUST SHUT-OFF.

d. Check that flaps are not sluggish in operation. It should take approximately 6 to 8 seconds for the flaps to extend or retract fully.

e. Stop flaps at various settings during extension and retraction to check that flaps do not coast.

f. Raise flaps and check each flap manually for full up position.

NOTE

At least one roller on each flap should contact the end of flap track slot with flaps in the full up position.

g. With flaps full UP, mount an inclinometer on one flap and set to 0°. Lower flaps to DOWN position and check flap angle as specified in figure 1-1. Raise flaps to 1/3 position, check that inclinometer reads approximately 8° and that position indicator reads approximately 1/3 (thru aircraft serial 337-0239) or that pointer indicates 1/3±1/16 inch (beginning with aircraft serial 337-0240 and F33700001).

NOTE

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

h. Remove flap well gap seal panels and access plates and attempt to rock bellcranks to check for bearing wear.

i. Inspect flap rollers and tracks for evidence of binding and defective parts.

j. Install elevator control lock or rigging tool to keep elevator in neutral, lower flaps to DOWN position and place elevator trim control in full NOSE UP position (trim tab full DOWN).

k. Mount an inclinometer (refer to note in step "g") on trim tab, raise flaps and check that trim tab moves from FULL DOWN position to degree of travel specified in figure 1-1 for that specific aircraft model. Refer to Section 8 for details of the flap/elevator trim interconnect system.

SHOP NOTES:

7-4. TROUBLE SHOOTING.

NOTE

Due to remedy procedures in the following trouble shooting chart it may be necessary to re-rig system, refer to paragraph 7-21.

TROUBLE	PROBABLE CAUSE	REMEDY
FLAPS FAIL TO MOVE.	Popped circuit breaker.	Check visually and reset breaker. If breaker pops again, determine cause and correct.
	Defective circuit breaker.	Check continuity. Replace breaker.
	Defective limit-switch.	Check continuity. Replace switch.
	Defective motor.	Remove and bench test. Replace motor.
	Broken or disconnected wires.	Check continuity. Connect or replace wiring.
	Defective or disconnected transmission or actuator assembly.	Connect or replace transmission or actuator assembly. Remove and bench test if necessary.
	Disconnected cables.	Check visually. Connect cables.
	Follow-up control disconnected or slipping. (Beginning with aircraft serials 337-0240 and F33700001.)	Check visually. Secure control or replace if defective.
	Three-position switch on instrument panel defective. (Thru aircraft serial 337-0239.)	Check continuity. Replace defective switch.
BINDING IN SYSTEM AS FLAPS ARE RAISED AND LOWERED.	Cables not riding on pulleys.	Check visually. Route cables correctly over pulleys. Check cable guards.
	Bind in bellcranks.	Check visually. Repair or replace bellcranks.
	Broken or binding pulleys.	Check visually. Replace defective pulleys.
	Frayed cable.	Check visually. Replace defective cable.
	Flaps binding on tracks.	Check visually. Replace defective parts.
	Solenoid brake not releasing completely. (Thru aircraft serial 337-0239.)	Check brake operation. Adjust brake properly or replace if defective.

TROUBLE	PROBABLE CAUSE	REMEDY
FLAPS ON ONE WING FAIL TO MOVE.	Disconnected or broken cable.	Check visually. Connect or replace cable.
	Broken attachment to actuator.	Check visually. Replace defective parts.
	Defective bellcranks or linkage to flaps.	Check visually. Replace defective parts.
INCORRECT FLAP TRAVEL.	Incorrect rigging.	Refer to paragraph 7-21.
	Defective limit-switch.	Check continuity. Replace switch.
	Follow-up control disconnected or slipping. (Beginning with aircraft serials 337-0240 and F33700001.)	Secure control or replace if defective.
FLAPS COASTING. (Thru aircraft serial 337-0239.)	Solenoid brake defective or improperly adjusted.	Check brake operation. Adjust or replace brake as required.
FLAP POSITION INDICATOR FAILS TO RESPOND. (Thru aircraft serial 337-0239.)	Popped circuit breaker.	Check visually. Reset breaker. If it pops out again, determine cause and correct.
	Defective circuit breaker.	Check continuity. Replace defective breaker.
	Defective wiring.	Check continuity. Repair wiring.
	Defective position transmitter.	Disconnect "hot" wire to transmitter. Check transmitter for varying resistance as transmitter arm is moved. Replace defective transmitter.
	Defective position indicator.	If there is voltage to the indicator, continuity through wires and transmitter is good. Replace defective indicator.
FLAP POSITION INDICATOR FAILS TO RESPOND OR READINGS ERRONEOUS. (Beginning with aircraft serials 337-0240 and F33700001.)	Follow-up control slipping in clamps or broken or disconnected control.	Check visually. Connect or secure control. Replace if defective.
	Pointer bent or broken.	Check visually. Repair or replace pointer.

7-4. TROUBLE SHOOTING (Cont).

TROUBLE	PROBABLE CAUSE	REMEDY
FLAP POSITION INDICATOR READINGS ERRONEOUS. (Thru aircraft serial 337-0239.)	Position transmitter not adjusted properly.	Refer to paragraph 7-21.
	Defective position transmitter.	Substitute a known-good transmitter and check operation. Replace defective transmitter.
	Defective position indicator.	Substitute a known-good indicator and check operation. Replace defective indicator.
	Loose electrical connection.	Check connections and tighten as required.
FLAPS FAIL TO EXTEND. (Beginning with aircraft serials 337-0240 and F33700001.)	Defective, loose, or improperly adjusted forward operating switch.	Check security, adjustment and operation of switch. Adjust, secure or replace switch as required.
	Follow-up control slipping, broken or disconnected.	Check visually. Connect and secure control. Replace if defective.
	Defective down-limit switch.	Check continuity. Replace defective switch.
FLAPS FAIL TO RETRACT. (Beginning with aircraft serials 337-0240 and F33700001.)	Defective loose or improperly adjusted aft operating switch.	Check security, adjustment and operation of switch. Adjust, secure or replace switch as required.

7-5. FLAP MOTOR, TRANSMISSION AND ACTUATOR ASSEMBLY.

7-6. REMOVAL AND INSTALLATION.

a. THRU AIRCRAFT SERIAL 337-0239 WHEN NOT MODIFIED IN ACCORDANCE WITH SK337-19.

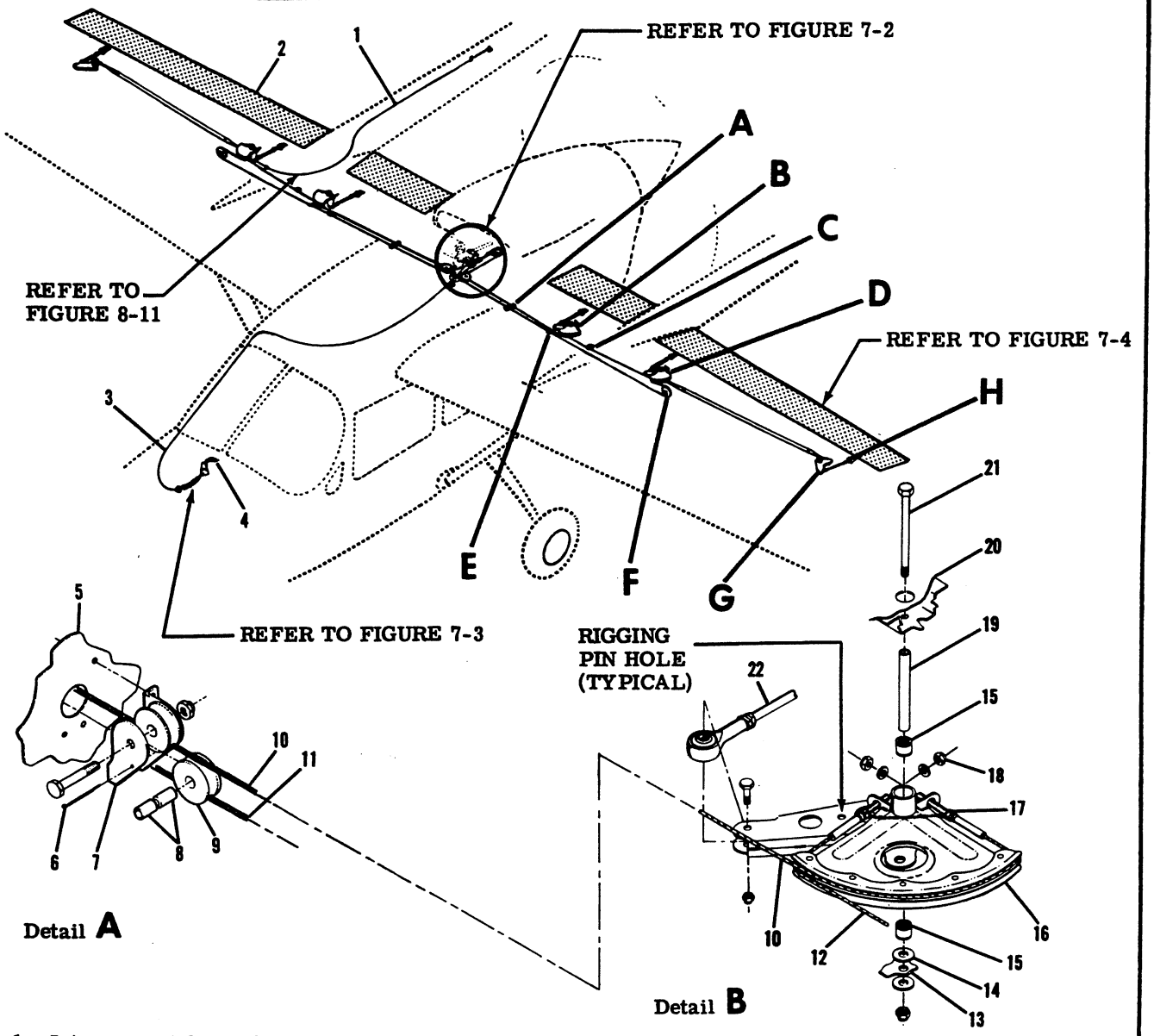
NOTE

The flap motor, brake, transmission and actuator assembly are normally removed as a unit. However, the motor and/or solenoid brake may be removed separately if desired.

1. Run flaps to DOWN position.
2. Disconnect battery terminals as a safety precaution.
3. Remove headliner and soundproofing as necessary to gain access.
4. (Refer to figure 7-1.) Remove flap well gap seal panel and flap well access plate aft of bellcrank assembly (16) in each wing, remove safety wire (17) and relieve tension on cable (10) by loosening adjustment nut (18).
5. (Refer to figure 7-2.) Remove bolts securing cables to actuator (10).
6. Disconnect the electrical wiring to motor assembly.
7. Remove bolts (12, 13 and 14) attaching actuator to support structure (15) and carefully remove assembly from aircraft.
8. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 7-21.

NOTE

If the motor and transmission were separated for any reason, refer to figure 7-5 during reassembly.



1. Interconnect Control
2. Aileron Assembly
3. Follow-Up Control
4. Control Lever
5. Upper Cabin Skin
6. Cable Guard
7. Bracket
8. Bushing
9. Pulley
10. Extend Cable (Inboard)
11. Retract Cable
12. Extend Cable (Outboard)
13. Lower Bellcrank Bracket
14. Brass Washer
15. Bearing
16. Bellcrank Assembly (Inboard Flap)
17. Safety Wire
18. Adjustment Nut
19. Bushing
20. Upper Bellcrank Bracket
21. Pivot Bolt
22. Push-Pull Rod
23. Bracket
24. Cable Guard
25. Bushing
26. Pulley
27. Upper Doubler
28. Inboard Bellcrank Assembly (Outboard Flap)
29. Synchronizing Push-Pull Tube
30. Lower Bracket
31. Attach Bracket
32. Outboard Bellcrank Assembly (Outboard Flap)
33. Lower Doubler

NOTE

All details shown are for LEFT wing. RIGHT wing opposite.

CAUTION

MAINTAIN PROPER CONTROL CABLE TENSION.

CABLE TENSION:
30 ± 10 LBS (AT AVERAGE TEMPERATURE FOR THE AREA.)
REFER TO FIGURE 1-1 FOR TRAVEL.

Figure 7-1. Wing Flaps Control System (Sheet 1 of 2)

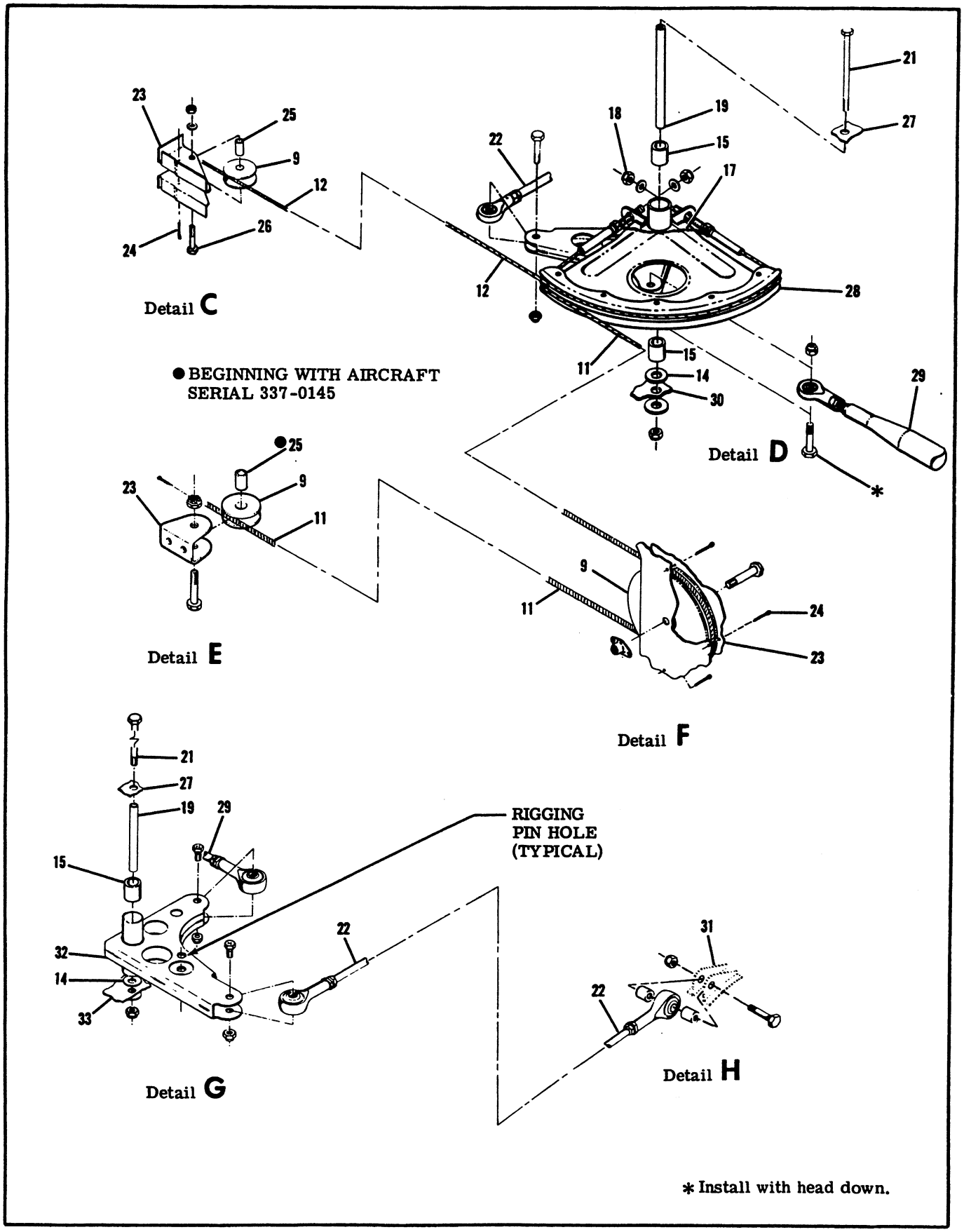
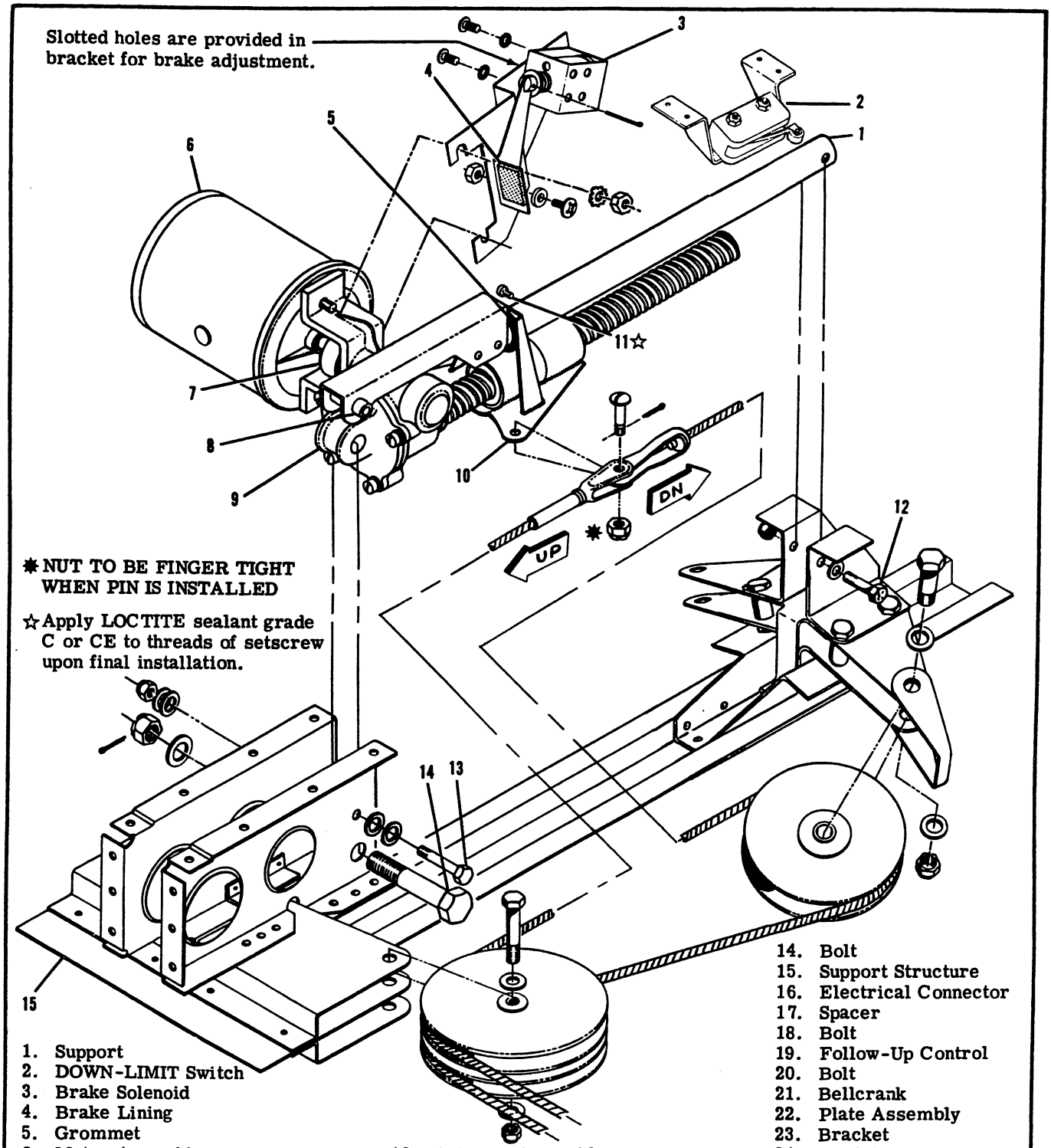


Figure 7-1. Wing Flaps Control System (Sheet 2 of 2)



1. Support
2. DOWN-LIMIT Switch
3. Brake Solenoid
4. Brake Lining
5. Grommet
6. Motor Assembly
7. Coupling
8. Bushing
9. Transmission Assembly
10. Actuator Assembly
11. Setscrew
12. Bolt
13. Bolt
14. Bolt
15. Support Structure
16. Electrical Connector
17. Spacer
18. Bolt
19. Follow-Up Control
20. Bolt
21. Bellcrank
22. Plate Assembly
23. Bracket
24. Insulator
25. Actuator
26. UP-LIMIT Switch
27. Switch Actuating Cam

AIRCRAFT SERIALS 337-0001 THRU 337-0239 WHEN NOT MODIFIED IN ACCORDANCE WITH SK337-19. REFER TO SHEET 2 FOR AIRCRAFT WHICH HAVE BEEN MODIFIED.

Figure 7-2. Flap Motor, Transmission and Actuator Installation (Sheet 1 of 2)

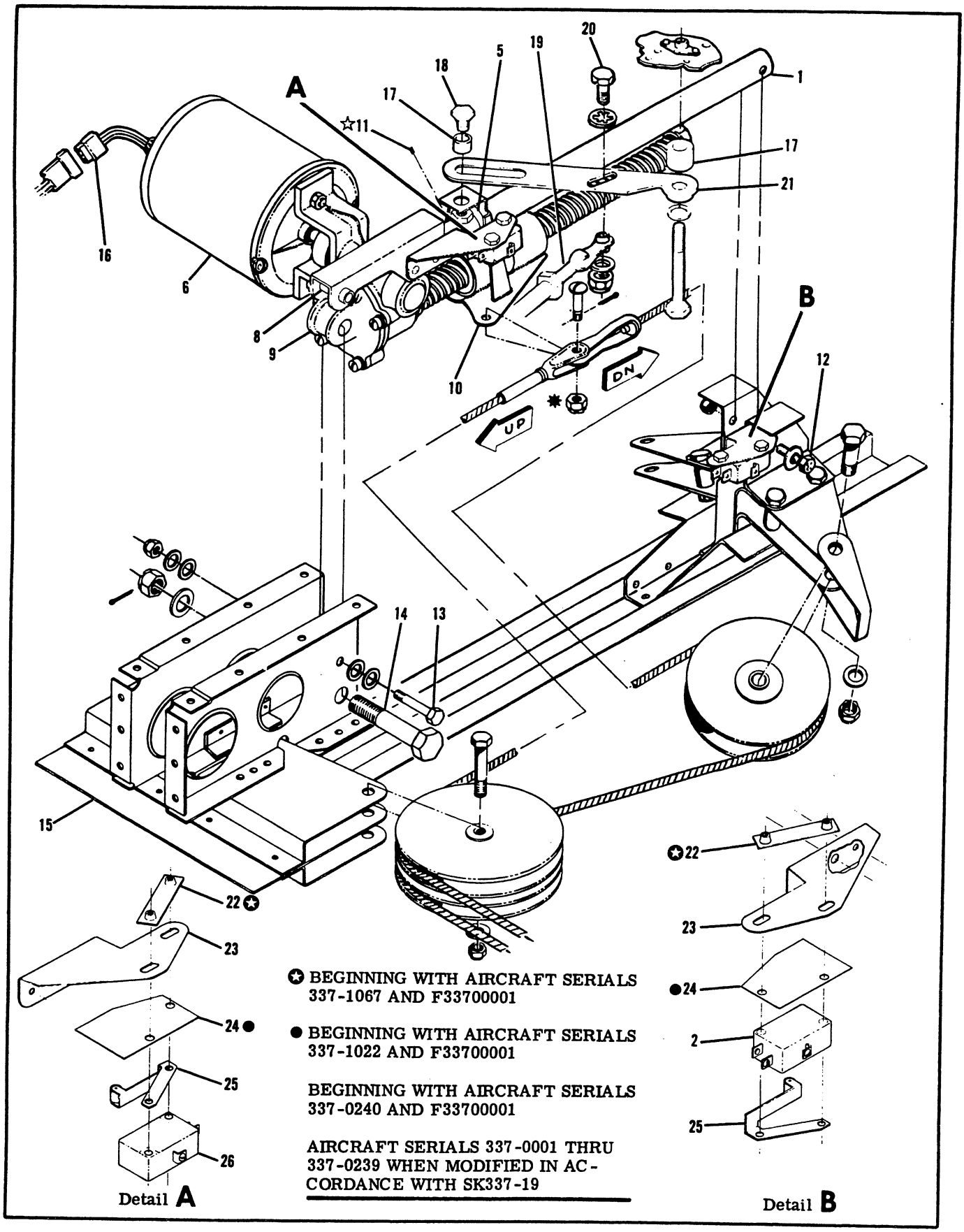


Figure 7-2. Flap Motor, Transmission and Actuator Installation (Sheet 2 of 2)

9. The solenoid brake must be adjusted with the solenoid actuated. The minimum clearance between the brake lining and any part of the coupling is .001 inch and the maximum clearance is .010 inch.

b. BEGINNING WITH AIRCRAFT SERIAL 337-0240 AND F33700001.

NOTE

Remove motor, transmission, actuator and support as a unit.

1. Complete steps 1 thru 5 of subparagraph "a."
2. Remove bolt (18) attaching bellcrank (21) to actuator (10).
3. Disconnect electrical connector (16) and remove switch (26) from mounting bracket (23). DO NOT DISCONNECT WIRING FROM SWITCH.
4. Remove bolts (12, 13 and 14) attaching actuator to support structure (15) and carefully remove assembly from aircraft.
5. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 7-21.

c. THRU AIRCRAFT SERIAL 337-0239 WHEN MODIFIED IN ACCORDANCE WITH SK337-19.

1. Use same procedure outlined in subparagraph "b" omitting step 2.

7-7. REPAIR. Repair consists of replacement of motor, transmission, coupling, brake, actuator parts and associated hardware. Lubricate as outlined in Section 2.

7-8. FLAPS. (Refer to figure 7-4.)

7-9. REMOVAL AND INSTALLATION.

a. Run flaps to DOWN position.

b. Disconnect push-pull rods at attach brackets (8) on flap to be removed.

c. Remove access plates (9) at top leading edge of flap.

d. Remove bolts (6) at each flap track. As flap is removed from wing, all spacers, rollers and bushings will fall free. Retain these for reinstallation.

e. Reverse the preceding steps for reinstallation. If the push-pull rod adjustment is not disturbed, rerigging of the system should not be necessary. Check flap travel and rig in accordance with paragraph 7-21, if necessary.

7-10. REPAIR. Repair may be accomplished in accordance with instructions outlined in Section 16.

7-11. BELLCRANKS. (Refer to figure 7-1.)

7-12. REMOVAL AND INSTALLATION.

a. BELLCRANK ASSEMBLY. (INBOARD FLAP-DETAIL B.)

1. Run flaps to DOWN position.
2. Remove flap well gap seal panel and access plate.
3. Disconnect push-pull rod (22) at bellcrank.
4. Remove safety wire (17), remove adjustment nuts (18) and remove cables from bellcrank.
5. Disconnect position transmitter link (index 11, figure 7-4) at bellcrank (thru aircraft serial 337-0239).
6. Remove pivot bolt (21) attaching bellcrank to wing structure.
7. Using care, remove bellcrank through access opening, being careful not to drop bushing (19). Retain brass washer (14) between bellcrank and lower wing structure for use on reinstallation. Tape open ends of bellcrank after removal to protect bearings (15).
8. Reverse the preceding steps for reinstallation. Rig system in accordance with paragraph 7-21.

b. INBOARD BELLCRANK ASSEMBLY. (OUTBOARD FLAP-DETAIL D.)

1. Complete steps 1 thru 4 in subparagraph "a."
2. Disconnect flap/elevator trim interconnect control from bellcrank (right wing only).
3. Disconnect synchronizing push-pull tube (29) at bellcrank (28).
4. Complete steps 6 thru 8 in subparagraph "a."

c. OUTBOARD BELLCRANK ASSEMBLY. (OUTBOARD FLAP-DETAIL G.)

1. Run flaps to DOWN position.
2. Remove flap well gap seal panel and access plate.
3. Disconnect synchronizing push-pull tube (29) at bellcrank (32).
4. Disconnect push-pull rod (22) at bellcrank.
5. Remove pivot bolt (21) attaching bellcrank to doublers (27 and 33).
6. Complete steps 7 and 8 in subparagraph "a."

7-13. REPAIR. Repair is limited to replacement of bearings. Cracked, bent or excessively worn bellcranks must be replaced. Lubricate as outlined in Section 2.

7-14. FLAP POSITION TRANSMITTER. (THRU AIRCRAFT SERIAL 337-0239.) (Refer to figure 7-4.)

7-15. REMOVAL AND INSTALLATION.

a. Remove access plates from bottom of left wing below inboard flap bellcrank.

b. Remove screws and nuts securing transmitter (13).

c. Remove the cotter pin, washer and spacer securing the flap position transmitter wire rod (12) to the link rod (11).

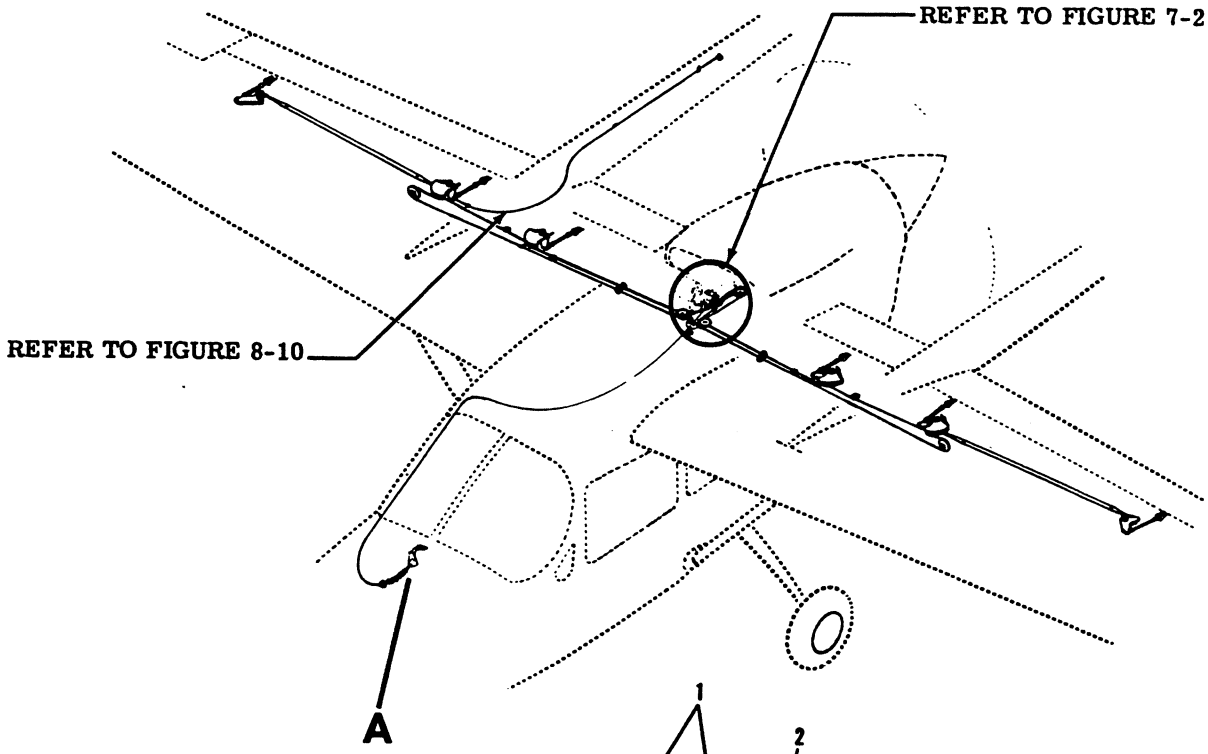
d. Disconnect the transmitter electrical wires at the quick-disconnects and remove the transmitter.

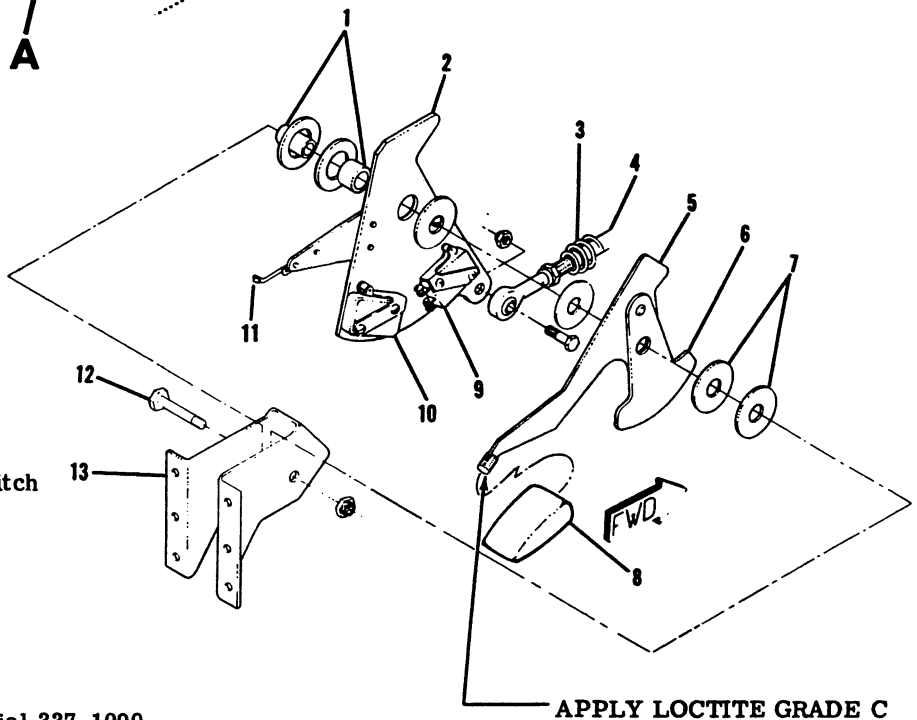
e. Reverse the preceding steps for reinstallation and adjust in accordance with paragraph 7-16.

7-16. ADJUSTMENT.

a. Remove access plates from bottom of left wing below inboard flap bellcrank.

b. Mount an inclinometer on trailing edge of flap and adjust to 0°. Lower flaps to 8° and adjust transmitter as necessary so that indicator reads 1/3. Slotted holes are provided at transmitter mounting





1. Bushings
2. Switch Mounting Arm
3. Spring
4. Follow-Up Control
5. Lever Assembly
6. Cam
7. Washers
8. Knob
9. Flaps DOWN Operating Switch
10. Flaps UP Operating Switch
11. Position Indicator
12. Bolt
13. Bracket

APPLY LOCTITE GRADE C OR CE UPON INSTALLATION OF KNOB (8)

Detail **A**

NOTE

Beginning with aircraft serial 337-1090 insulators are installed between switches (9 and 10) and switch mounting arm (2).

Beginning with aircraft serials 337-1121 and F33700001, the washers and nuts which secured switches (9 and 10) to switch mounting arm (2) were replaced by a nut plate assembly to ease removal and installation of switches.

BEGINNING WITH AIRCRAFT SERIAL 337-0240

Figure 7-3. Control Lever Installation

screws. If additional adjustment is necessary, the wire rod on transmitter may be bent slightly.

NOTE

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

7-17. FLAP CONTROL LEVER. (BEGINNING WITH AIRCRAFT SERIAL 337-0240 AND F33700001.) (Refer to figure 7-3.)

7-18. REMOVAL AND INSTALLATION.

a. Disconnect battery terminals as a safety precaution.

b. Disconnect follow-up control (4) at switch mounting arm (2).

c. Remove flap operating switches (9 and 10) from switch mounting arm (2). DO NOT disconnect electrical wiring at switches.

d. Remove knob (8) from control lever (5).

e. Remove remaining items by removing bolt (12).

f. Reverse the preceding steps for reinstallation. Do not overtighten bolt (12) causing lever (5) to bind. Rig system in accordance with paragraph 7-21.

7-19. CABLES AND PULLEYS. (Refer to figure 7-1.)

7-20. REMOVAL AND INSTALLATION.

a. EXTEND CABLE (INBOARD).

1. Run flaps to DOWN position.

2. Remove flap well gap seal panels and access plates as necessary to expose components in Details A and B.

3. Remove headliner as necessary to expose actuator assembly (figure 7-2).

4. Remove safety wire (17) and remove adjustment nut (18) from control cable (10) in Detail B.

5. Disconnect cables at actuator (index 10, figure 7-2).

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

NOTE

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

7. Reverse the preceding steps for reinstallation.

8. After cable is routed in position, install pulleys and cable guards. Ensure cable is installed in pulley grooves before installing guards. Re-rig system in accordance with paragraph 7-21, safety cable ends and reinstall all items removed for access.

b. EXTEND CABLE (OUTBOARD).

1. Run flaps to DOWN position.

2. Remove flap well gap seal panels and access plates as necessary to expose components in Details B, C and D.

3. Remove safety wire (17) and remove adjustment nuts (18) from control cable (12) in Details B and D.

4. Remove pulley (index 9, Detail C).

5. Refer to "note" in step 6 of sub-paragraph "a."

6. Reverse the preceding steps for reinstallation.

7. After cable is routed in position, install pulley. Ensure cable is installed in pulley groove and that cable guard (24) is installed. Re-rig system in accordance with paragraph 7-21, safety cable ends and reinstall all items removed for access.

c. RETRACT CABLE.

1. Run flaps to DOWN position.

2. Remove flap well gap seal panels and access plates as necessary to expose components in Details A, D, E and F.

3. Remove headliner as necessary to expose actuator assembly (figure 7-2).

4. Remove safety wire (17) and remove adjustment nut (18) from control cable (11) in Detail D.

5. Disconnect cables at actuator (index 10, figure 7-2).

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

7. Refer to "note" in step 6 of subparagraph "a."

8. Reverse the preceding steps for reinstallation.

9. After cable is routed in position, install pulleys and cable guards. Ensure cable is installed in pulley grooves before installing guards. Re-rig system in accordance with paragraph 7-21, safety cable ends and reinstall all items removed for access.

7-21. RIGGING.

NOTE

The following procedures outline COMPLETE flap system rigging. All steps of these procedures should be noted, although individual circumstances may not require that all steps be completed.

a. THRU AIRCRAFT SERIAL 337-0239 WHEN NOT MODIFIED IN ACCORDANCE WITH SK337-19.

1. (Refer to figure 7-1.) Run flaps to DOWN position.

2. Remove flap well gap seal panels and access plates as necessary to expose Details A thru H on BOTH wings.

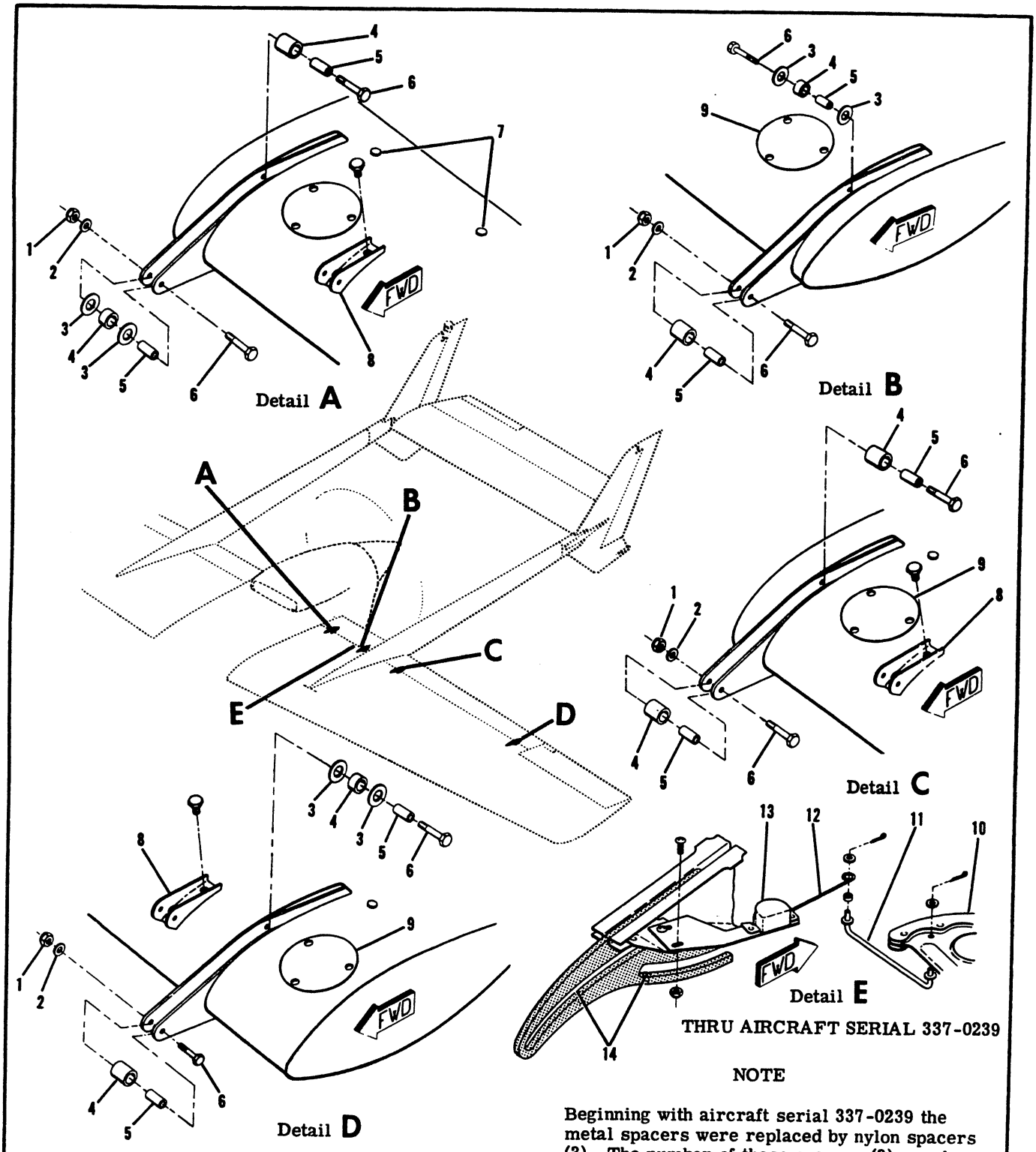
3. Remove headliner as necessary to expose actuator assembly (figure 7-2).

4. Disconnect all flap push-pull rods (22) at the bellcranks.

5. Loosen all cables (10, 11 and 12) at bellcranks (16 and 28) in both wings by loosening adjustment nuts (18).

6. Run flap motor to the full UP position.

7. Tighten adjustment nuts (18) on cables (10, 11 and 12) evenly to position bellcranks (16 and 28) in each wing so that rigging pins will engage at each bellcrank while maintaining 30±10 pounds cable tension.



1. Nut
2. Washer
3. Spacer
4. Roller
5. Bushing
6. Bolt
7. Rub Button
8. Attach Bracket
9. Access Plate
10. Left Inboard Bellcrank
11. Link
12. Transmitter Wire Rod
13. Position Transmitter
14. Flap Roller Slot

THRU AIRCRAFT SERIAL 337-0239

NOTE

Beginning with aircraft serial 337-0239 the metal spacers were replaced by nylon spacers (3). The number of these spacers (3) may be altered on either side of the flap tracks to aid alignment of flaps, providing sufficient clearance is maintained for free movement of the roller assemblies.

All details shown are for the LEFT wing. RIGHT wing opposite.

Figure 7-4. Flap Installation

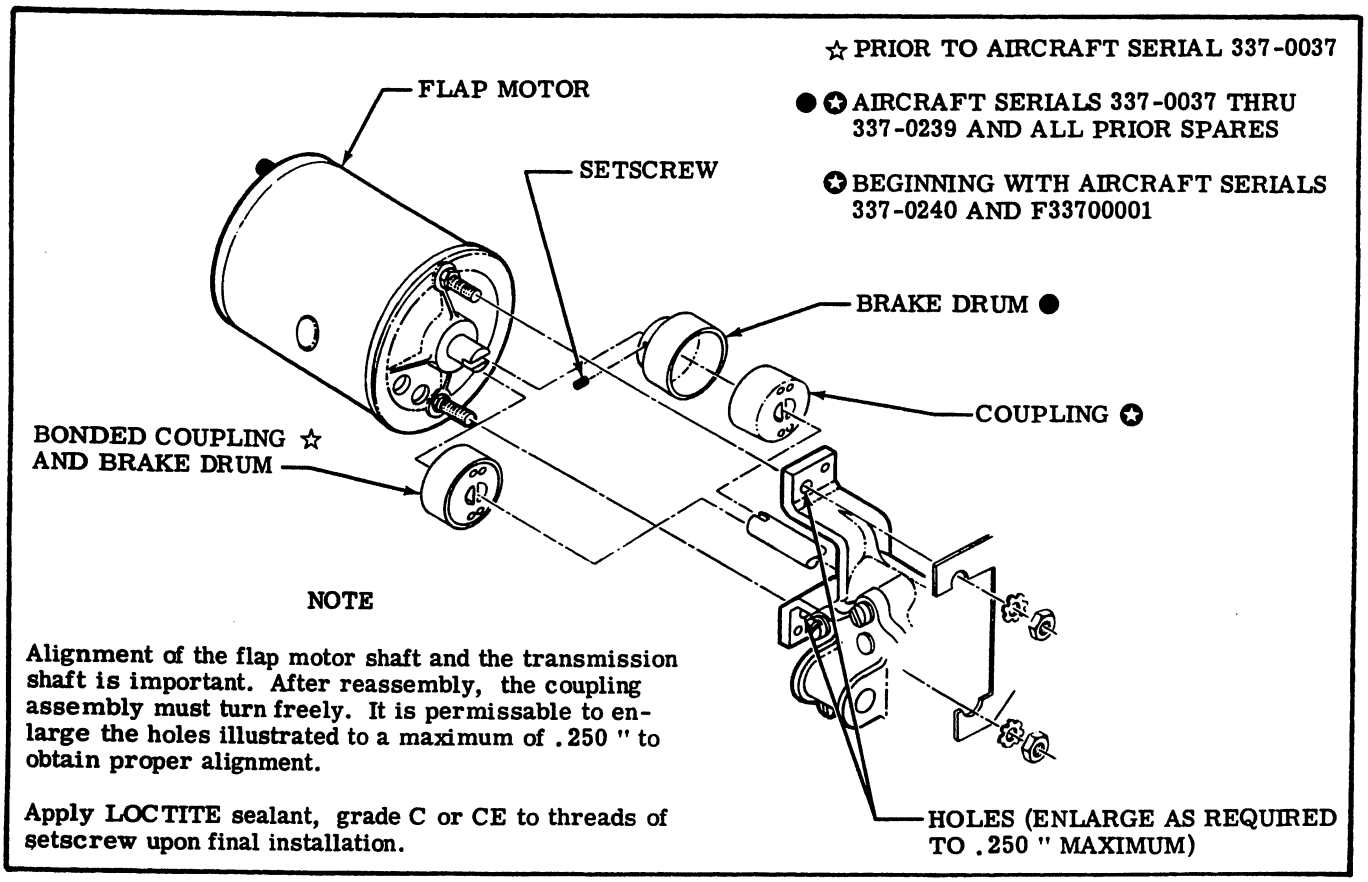


Figure 7-5. Flap Motor and Transmission Alignment

NOTE

Ensure that the cables are in their pulley grooves and correct bellcrank tracks before and after completion of step 7.

- The rigging pins may be fabricated from any suitable 3/16 inch diameter material such as steel rod or bolts. The length of the outboard bellcrank pins should be approximately 6 inches and 2 inches for the inboard bellcrank pins.

8. Disconnect push-pull tubes (29) at outboard bellcranks (32).
9. Install rigging pins in bellcranks (32) and adjust push-pull tubes (29) to align with bellcranks. Connect push-pull tubes and tighten jam nuts.

CAUTION

DO NOT run flap motor while rigging pins are installed.

10. Remove all rigging pins.

NOTE

If rigging pins cannot be removed from bellcranks with only slight effort, repeat steps 7 thru 9.

11. (Refer to figure 7-2, sheet 1.) Loosen screws attaching DOWN-LIMIT switch (2) to bracket and slide the switch aft in the slotted holes as far as possible.
12. Run the flap motor to the full DOWN position.
13. Manually hold one inboard flap in the full UP position (snug, but not tight). Mount an inclinometer on the trailing edge of flap and set to 0°. Lower the flap manually to full DOWN position and adjust push-pull rod (22) to align with bellcrank attaching hole. Connect push-pull rod and tighten jam nuts.

NOTE

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

14. Repeat step 13 for the remainder of flaps.
15. Run the flap actuator back from the full DOWN position .050 inch.
16. Slide the DOWN-LIMIT switch forward in the slotted holes until the switch just actuates. Secure switch in this position.
17. Operate the flaps several times, checking that the switch opens the circuit .050 inch BEFORE freewheeling occurs.
18. Adjust the position transmitter in accordance with paragraph 7-16.
19. Perform an operational checkout of the flap system in accordance with paragraph 7-3, install all

safeties and reinstall all items removed for access.

b. BEGINNING WITH AIRCRAFT SERIAL 337-0240 AND F33700001.

CAUTION

Do not use aircraft power to operate the flap motor until the limit-switches on the actuator assembly have been adjusted or damage may occur due to overtravel. Separate the electrical connector at the flap motor and connect jumper wires from a 24-volt power source to operate the flap motor. The leads may be reversed to change motor direction or a 3-position switch (spring-loaded to center OFF position) may be used. Use caution when approaching travel extremes as there is no provision for freewheeling in the transmission.

1. Complete steps 1 thru 5 of subparagraph "a."
2. Disconnect the follow-up control clevis (index 19, figure 7-2) from bellcrank (index 21, figure 7-2).
3. Disconnect battery terminals as a safety precaution. Using jumpers and an external power source, carefully run flap motor to full UP position.
4. Complete steps 7 thru 10 of subparagraph "a."
5. Using jumpers and external power source, carefully run flap motor to full DOWN position.
6. Complete steps 13 and 14 of subparagraph "a."
7. (Refer to figure 7-2.) With flap motor in the full DOWN position, adjust DOWN-LIMIT switch (index 2, sheet 2) to the ACTUATED position and secure switch.
8. Using jumpers and external power source, carefully run flap motor to the full UP position. Adjust up-limit switch (26) to DEACTUATE flap motor when inclinometer reads 0° and secure switch.
9. Cycle flaps several times and check degree of travel as specified in figure 1-1. Check cable tension at various mid-range settings and at travel extremes. Readjust down-limit switch as necessary to obtain proper travel.
10. Connect follow-up control (19) to bellcrank (21). Run flaps through full range of travel and observe pointer movement. Adjust follow-up control clevis in slot of bellcrank (21) and rod end at instrument panel as necessary to obtain full pointer travel in indicator slot.
11. Carefully run flaps to full UP position, then disconnect and remove the jumpers and external power source from flap motor.
12. Connect electrical connector at flap motor and connect battery terminals.
13. (Refer to figure 7-3.) Move control handle (5) to the full UP position, move switch mounting arm (2) until cam (6) is centered between switches (9 and 10).
14. Adjust switches (9 and 10) in slotted holes until switch rollers just clear cam (6) and secure.
15. Turn master switch ON and run flaps through various mid-range settings to the full DOWN position. Check that the limit-switches on the actuator de-actuate system at the travel extremes.
16. Run flaps to full UP position. Mount an inclinometer on one flap and set to 0°. Move control lever (5) to 1/3 position, check that flaps stop at 8° and that the pointer indicates 1/3 position (± 1/16 inch).
17. Check all rod ends and clevis ends for sufficient thread engagement, all jam nuts are tight, safety wire all cable ends and reinstall all items removed for access.
18. Flight test aircraft and check that follow-up control does not cause automatic cycling of flaps. If cycling occurs, readjust switches (9 and 10) as necessary per steps 13 and 14.

c. AIRCRAFT SERIALS 337-0001 THRU 337-0239 WHEN MODIFIED IN ACCORDANCE WITH SK337-19.

CAUTION

Do not use aircraft power to operate the flap motor until the limit-switches on the actuator assembly have been adjusted or damage may occur due to overtravel. Separate the electrical connector at the flap motor and connect jumper wires from a 24-volt power source to operate the flap motor. The leads may be reversed to change motor direction or a 3-position switch (spring-loaded to center OFF position) may be used. Use caution when approaching travel extremes as there is no provision for freewheeling in the transmission.

1. Complete steps 1 thru 5 of subparagraph "a."
2. Complete step 3 of subparagraph "b."
3. Complete steps 7 thru 10 of subparagraph "a."
4. Complete step 5 of subparagraph "b."
5. Complete steps 13 and 14 of subparagraph "a."
6. Complete steps 7 thru 9 of subparagraph "b."
7. Complete steps 11 and 12 of subparagraph "b."
8. Complete steps 18 and 19 of subparagraph "a."

7-22. FLAP/ELEVATOR TRIM INTERCONNECT. Refer to Section 8 for removal, installation and rigging of flap/elevator trim interconnect.