



# SERVICE BULLETIN

No. 741

Piper Aircraft Corporation

Modification FAA Approved

Lock Haven, Pennsylvania, U.S.A.

March 1, 1982 M

This Service Bulletin consists of two (2) separate PARTS. Refer to each PART for specific Subjects, Models and Serial Numbers Affected, Compliance Times, Purposes and Instructions.

Subject:

PART I: Wing Flap Travel Restriction and Inspection of Wing Flap Flexible Drive Shaft

PART II: Wing Flap Operating Procedures

Models Affected:

PART I: PA-31T Cheyenne

PART II: PA-31T Cheyenne/  
Cheyenne II

PA-31T1 Cheyenne I

Serial Numbers Affected:

31T-7400002 through 31T-7520013  
(Until Installation of Piper Kit 764 398, Wing Flap Transmission Modification, is installed)

31T-7520014 through 31T-7820066 and  
31T-7820068 through 31T-7820092  
(and 31T-7400002 through 31T-7520013 if Piper Kit 764 398, Wing Flap Transmission Modification, is installed)

31T-7804001 through 31T-7804011

Compliance Time:

- PART I: A. Within the next twenty-five (25) hours of operation, restrict wing flap travel in accordance with procedures in PART I, A, below.
- B. Within the next one hundred (100) hours of operation or at the next scheduled maintenance event, whichever occurs first, and at each five hundred (500) hours of operation thereafter, until installation of Piper Kit 764 398, Wing Flap Transmission Modification, inspect wing flap flexible drive shaft in accordance with PART I, B, below.
- C. On or before August 1, 1982, install Piper Kit 764 398, Wing Flap Transmission Modification.

NOTE: Installation of Piper Kit 764 398 relieves the requirements of PART I. Upon installation of Kit 764 398, refer to PART II.

PART II: Within the next twenty-five (25) hours of operation.

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Purpose:

PART I: Recent field reports have been received indicating flap system malfunctions which were the result of failures of the wing flap flexible drive shaft assemblies. Should such a failure occur, an asymmetric ("split") flap condition could result. An asymmetric flap condition in excess of 25° flap extension could result in loss of lateral control.

Recent flight tests evaluations have determined that restriction of flap travel to the first stop (15°) will allow the aircraft to be controllable should a full split flap condition occur.

PART I of this Service Release provides instructions to restrict the use of full flaps to 15° (first stop), to install a temporary Flap Restriction and Autopilot/Flap operation placard and install temporary stall speed placards, to modify flap indicator markings, and to incorporate a handwritten Pilot's Operating Manual/AFM revision.

PART I also includes detailed instructions for inspection of the wing flap flexible shaft assemblies.

PART I also announces Piper Kit, 764 398 Wing Flap Transmission Modification, the installation of which relieves the restriction and inspection requirements of PART I.

- NOTES:
1. Restriction of full flap travel at 15° will result in an increase of approximately 15% to the landing distances and an increase in the full flap stall speeds as presently published in the Performance section of the Pilot's Operating Manual/AFM for the affected airplanes.
  2. Upon installation of Piper Kit 764 398, refer to PART II, below.

PART II: It has been determined that an asymmetric ("split") flap condition which exceeds 25° differential could result in loss of lateral control. Revised flap selection procedures have been developed to allow better monitoring of the condition of the flaps during extension and to prevent sudden high differential asymmetry in the event of a system malfunction.

PART II of this Service Release provides instructions to install an Autopilot/Flap Operating placard and to incorporate handwritten Pilot's Operating Manual/Pilots Operating Handbook/AFM revisions.

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## PART I

Instructions:

A. Restrict the use of full flaps to a maximum of 15° as follows:

1. Verify rigging and adjustment of flap position sender as described in the Surface Controls section (Chapter 5) of the appropriate Service Manual.
2. Lower flaps to the 15° position.

NOTE: Remove excess play by lifting the flap trailing edge and obtain an angle measurement using a propeller protractor.

3. Paint a red full flap radial position mark to correspond with the needle position at 15° on the flap position indicator lens. Extend the red radial line to the instrument bezel as a slip mark (Sketch A).
4. Attach the Flap Restriction Placard to the left window moulding in full view of the pilot (Sketch B).
5. Attach the Stall Speed Placard(s) adjacent to the airspeed indicator(s) (Sketch C).
6. Make the necessary handwritten changes in pen and ink to the Pilot's Operating Manual/AFM as follows (until installation of Piper Kit 764 398, after which refer to PART II, Instruction 2.(a) (i):  
Approved Airplane Flight Manual per Report No. 1740 for Model PA-31T Serial Nos. 31T-7400002 through 31T-7520013

Page 3-vii	Log of Revisions. Add: Interim Revision 12 IAW Piper Service Bulletin No. 741.
Page 3-4	I. Airspeed Limits (CAS) Delete: Flaps Extended Speed 40° 144 KTS/165 MPH Add the following placard adjacent to airpseed indicator: "Stall speed 92 MPH/80KT with 15° Flaps."
Page 3-9	Subparagraph U. - Placards Add the following placard: On Pilot's left window moulding: " - Flap settings in excess of 15° are not approved. - Increase landing distance by 15% with use of 15° flaps. - Approach at 103 KTS/119 MPH, (CAS), 109 KTS/125 MPH (CAS) with SAS override on. - No flap selection with Autopilot engaged."
Page 3-26	Paragraph 13 - <u>Before Landing</u> Revise: b. Wing flaps - As required Extend at less than 174 KTS/200 MPH- Maximum extension -15°, No flap selection with autopilot engaged.

(over)

Instructions: (continued)

## A. 6. continued

Add a new page numbered 3-34a with the following Paragraph 7:

## 7. Flap Selection Procedure

CAUTION: Do not exceed the approach detent selector position when making selection. If this should occur, return the selector to its original position prior to selection, then return to the approach position.

When making the selection to the approach position, continuously monitor the flap position indicator pointer for proper movement. The pointer should begin to move smoothly toward the approach dial mark immediately upon selection. If the pointer stops before reaching the approach position, immediately return the flap selector switch to its original position. i.e., If selecting from up to approach, return to up.

Page 3-46a. Paragraph 25 - Asymmetric Flap Condition

Delete: Subparagraph a. and b.

Add: New subparagraph a. as follows:

## a. Split Flaps (0° to 15°)

1. Flap Switch - OFF
2. Aileron - Maintain Wings level
3. Airspeed - 104 KTS/120 MPH
4. Flap Switch - Opposite direction  
(Try to obtain symmetric flaps)
5. Land as soon as possible at nearest suitable airport.

7. Make appropriate logbook entry of compliance with PART I, A, of Piper Service Bulletin 741.

NOTE: A permanent Autopilot/Flap Operation Placard, Piper Part No. 81009-02, and permanent Pilot's Operating Manual Revision for affected aircraft are in preparation as of the release date of this Service Bulletin. Upon completion, the revisions will be supplied through normal revision mailing procedure. Receipt and incorporation of this permanent revision will supersede the handwritten changes given above. The permanent Autopilot/Flap operation placard will be included in Piper Kit 764 398.

## B. Inspect flap flexible drive shaft assemblies as follows:

1. Gain access to flap motor, Piper Part Number 475 208 and flexible shaft assemblies, (drive shaft), Piper Part Number 486 631, as outlined in the Surface Controls section (Chapter V) of the appropriate PA-31T Cheyenne Service Manual.
2. Remove all Ty-Raps and support clamps along the entire length of both flexible shaft assemblies, and inspect the outer housing. If the housing is damaged, replace the flexible shaft assembly.

Instructions: (continued)

- B. 3. Disconnect flexible shafts and remove the flap motor. Using caution not to damage the flexible shaft housing, route the flexible shafts outboard through the longitudinal beams (Ref Sketch D).

NOTE: Do not disconnect flexible shaft from transmission at this time.

4. Visually inspect the flexible shaft splined drive coupling and retaining pin for evidence of looseness on the cable swage fitting. (Ref. Sketch D, Figure 2.)
5. Inspect the swaged fittings at both ends of the flexible shaft as follows:
  - a. Expose the swaged portion of the inner cable at the motor end by twisting the outer housing two (2) turns clockwise. The swaged portion of the cable should have eight (8) flats clearly visible and free from deep scratches or wear marks. (Ref. Sketch D, Figure 2.)
  - b. Using a micrometer, or dial caliper, measure the diameter of the swage at each of the flats at the middle of the swaged portion of the cable. A total of four (4) measurements should be taken. If any of the measurements exceed .247 inches, replace the drive shaft.
  - c. Disconnect drive shaft from the flap transmission. Using caution not to damage the shaft housing, route inboard through the Sta. 87.50 bulkhead. (Ref Sketch E.) Inspect the swaged portion of the drive blade fitting end as described in "a" and "b" above.
  - d. Inspect the drive blade dimension as shown in Sketch E, Figure 4.
6. Inspect the internal splines of the drive coupling for evidence of wear. If splines are distorted or significantly worn, replace the drive shaft. Use the following method to determine if the amount of spline wear is acceptable.
  - a. Twist a piece of .032 safety wire around the swaged fitting at the motor end of the drive shaft to form a pointer (Ref Sketch F, Figure 5). With one end of the flap motor armature shaft secured engage the opposite end into the flexible shaft spline.
  - b. Hold the spline end of the flexible shaft securely with one hand, and gently turn the flap motor to remove rotational play in the splines. Place a reference mark on the motor housing adjacent to the wire pointer (Ref Sketch F, Figure 5). Turn the flap motor gently in the opposite direction to remove rotational play and place another reference mark on the motor housing. If the distance between these two marks exceed 5/32 of an inch (4 mm) replace the flexible shaft assembly (Ref Sketch F, Figure 5).
7. While holding the transmission end of the drive shaft stationary, twist the motor end one (1) turn clockwise and release. Inspect for evidence of movement between the inner cable and the swaged fittings at both ends. Turn cable one (1) turn counter-clockwise and repeat inspection. (Ref. Sketch D, E.) If movement or separation between the inner cable and the swage fitting is apparent, replace the flexible shaft assembly.

NOTE: If pliers or similar tool is used to twist cable, wrap cable ends with tape or a cloth to prevent damage.

(over)

Instructions: (continued)

- B. 8. Determine that the inner cable moves freely within the housing, and may be turned easily by hand. If there is any snagging or binding the cable must be replaced.
9. Reassembly of the flap system:
- Ascertain that the flap motor shaft is centered within the motor adapter housing (Ref. Sketch F, Figure 6.).
  - Lubricate both ends of the flexible shafts with MIL-G-23827 grease.
  - Reassemble and verify flap system rigging as outlined in the Surface Controls section (Chapter V) of the appropriate Service Manual.
10. Reinstall floorboards and access panels.
11. Make appropriate logbook entry of compliance with PART I, B, of Piper Service Bulletin No. 741.
- C. Install Piper Kit 764 398, Wing Flap Transmission Modification Kit, after which refer to PART II, below. Piper Kit 764 398 includes material and instructions required to change the transmission ratio from 20:1 to 40:1, and supplies a permanent Autopilot/Flap Operation Placard, Part No. 81009-02.

Material Required:

- If required by Inspection, one (1) or two (2) each per aircraft Flexible Drive Shaft Assembly, Piper Part No. 486 631.
- To relieve restrictions and inspection of PART I, Piper Kit 764 398, Wing Flap Transmission Modification Kit.

NOTE: Factory parts for Piper Kit 764 398 will be available for shipment on or before June 1, 1982.

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PART II

Instructions:

- Attach Autopilot/Flap Operating Placard, to the pilots left window moulding in full view of the pilot (Refer to Sketch B).
- Make necessary handwritten changes in pen and ink to the appropriate Airplane Flight Manual/Pilot's Operating Manuals/Pilot's Operating Handbook as follows:
  - For Piper Model PA-31T Cheyenne
    - Approved Airplane Flight Manual per Report No. 1740 for Model PA-31T, Serial Nos. 31T-7520014 through 31T-7620057. (And Ser.Nos. 31T-7400002 through 31T-7520013 only if Piper Kit 764 398 is installed.)  
Page 3-vii                      Log of Revisions. Add: Interim Revision 12 IAW  
Piper Service Bulletin No. 741.

Instructions: (continued)

## 2. a. Page 3-26

Paragraph 13 - Before Landing

Revise subparagraph b. as follows:

- b. Flaps -15° down at 174 KTS/200 MPH or less,  
40° down at 144 KTS/165 MPH or less, no flap  
selection with autopilot engaged.

Add a page numbered 3-34a with the following Paragraph 7:

## 7. Flap Selection Procedure

- 1. Select flap position in two stage steps only.
  - a. Extension:
    - Step 1. Up to approach
    - Step 2. Approach to down
  - b. Retraction: (Flight only)
    - Step 1. Down to approach
    - Step 2. Approach to up

CAUTION: Do not exceed the approach detent selector position when making selection. If this should occur, return the selector to its original position prior to selection, then return to the approach position.

- 2. When making the selection to the approach position, continuously monitor the flap position indicator pointer for proper movement. The pointer should begin to move smoothly toward the approach dial mark immediately upon selection. If the pointer stops before reaching the approach position, immediately return the flap selector switch to its original position. i.e., If selecting from up to approach, return to up. If selecting from down to approach, return to down.

Page 3-9.

Under subparagraph U. (Placards) add:

"No flap selection with autopilot engaged."

- (ii) Approved Pilot's Operating Handbook per Report No. 2048 for Model PA-31T Ser. Nos. 31T-7720001 through 31T-7820066 and 31T-7820068 through 31T-7820092.

Page iv-j

Log of Revisions. Add: Interim Revision 8 IAW Piper Service Bulletin No. 741.

Page 4-9

Before Landing

After line containing "FLAPS ..." add "Note, no flap selection with autopilot engaged."

(over)

Instructions: (continued)

2. a. (ii) Page 7-13a.

Change subparagraphs (b) and (c) to read:

(b) Select flap position in two stage steps only

1. Extension:

Step 1. Up to approach

Step 2. Approach to down

2. Retraction: (Flight only)

Step 1. Down to approach

Step 2. Approach to up

CAUTION: Do not exceed the approach detent selector position when making selection. If this should occur, return the selector to its original position prior to selection, then return to the approach position.

(c) When making the selection to the approach position, continuously monitor the flap position indicator pointer for proper movement. The pointer should begin to move smoothly toward the approach dial mark immediately upon selection. If the pointer stops before reaching the approach position, immediately return the flap selector switch to its original position. i.e., If selecting from up to approach, return to up. If selecting from down to approach, return to down.

Page 2-17

Under subparagraph 2.41 (Placards) add:

"No flap selection with autopilot engaged."

b. For Piper Model PA-31T1 Cheyenne I(i) Approved Pilot's Operating Handbook per Report No. 2124 for Model PA-31T1 Ser. Nos. 31T-7804001 through 31T-7804011.

Page vi-ai. Log of Revisions. Add: Interim Revision 13 IAW Piper Service Bulletin No. 741.

Page 4-10. Before Takeoff

Change line "FLAPS ..." to read, "FLAPS - Set 0° to 15° - check extension visually - equal left and right."

Page 4-11. Before Landing

After line containing "FLAPS ..." add "Note, no flap selection with autopilot engaged."

Page 7-16a.

Change subparagraphs (b) and (c) to read:

(b) Select flap position in two stage steps only

1. Extension:

Step 1. Up to approach

Step 2. Approach to down

2. Retraction: (Flight only)

Step 1. Down to approach

Step 2. Approach to up



Instructions: (continued)

2. b. continued      CAUTION: Do not exceed the approach detent selector position when making selection. If this should occur, return the selector to its original position prior to selection, then return to the approach position.
- (c) When making the selection to the approach position, continuously monitor the flap position, indicator pointer for proper movement. The pointer should begin to move smoothly toward the approach dial mark immediately upon selection. If the pointer stops before reaching the approach position immediately return the flap selector switch to its original position. i.e., If selecting from up to approach, return up. If selecting from down to approach, return to down.
- (i) Page 2-22. Under subparagraph 2.36 (Placards) add:  
"No flap selection with autopilot engaged."
3. Make appropriate logbook entry of compliance with PART II Piper Service Bulletin No. 741.

NOTE: A permanent Autopilot/Flap Operation Placard, Piper Part No. 81009-02, and permanent Pilot's Operating Manual/Pilots Operating Handbook/AFM Revisions for affected aircraft are in preparation as of the release date of this Service Bulletin. Upon completion, both the Placards and the Revisions will be supplied through normal revision mailing procedures. Receipt and incorporation of these revisions will supersede the handwritten changes given above.

Material Required: One (1) each per aircraft permanent Autopilot/Flap Operation Placard, Piper Part No. 81009-02 (to be mailed with permanent Manual Revision).

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Availability of Parts: Your Piper Field Service Facility.

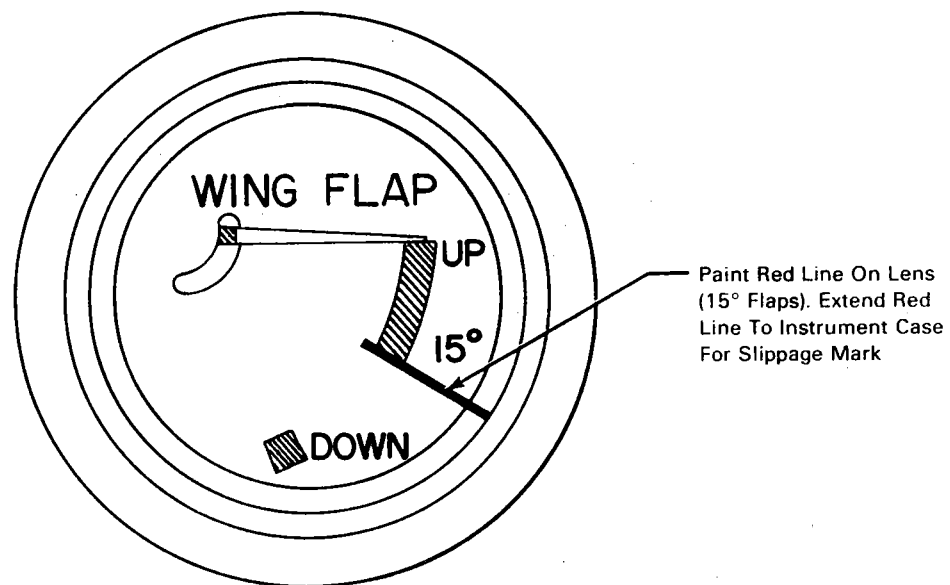
- NOTES:
1. Upon release, Permanent Operating Manual Revision will be mailed through normal procedures. If additional Revisions or Placards are required, advise your Piper Field Service Facility.
  2. Factory parts for Piper Kit 764 398, will be available for shipment on or before June 1, 1982.

(over)

Effectivity Date: This Service Release is effective upon receipt.

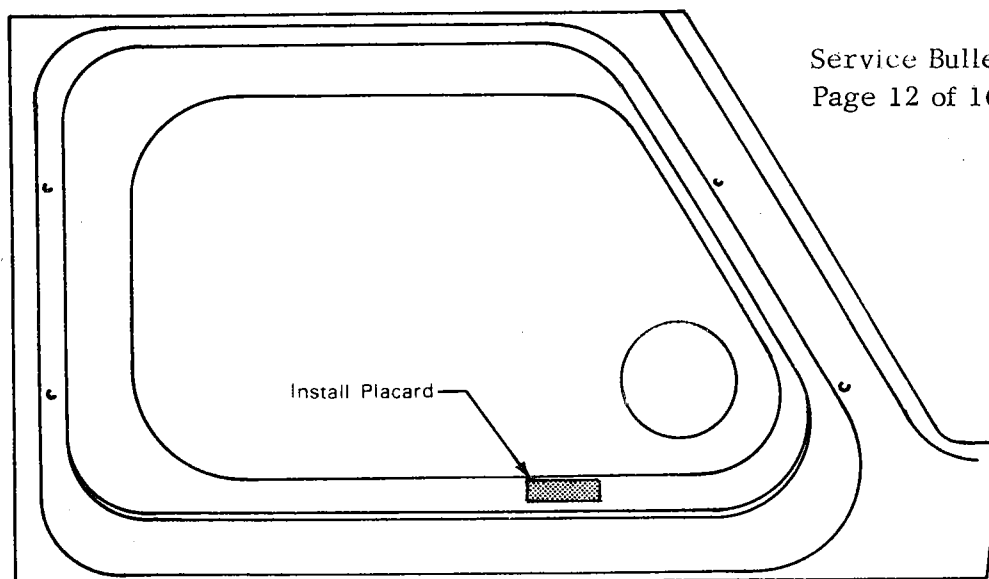
Summary: This Service Release was issued to provide detailed instructions for inspecting the flap system flexible shaft assemblies, to announce the restriction of flap travel limits, and to revise Flap operating procedures. This does not supersede the requirements of Service Bulletin 494B, as revised, and Service Letter 764A, as revised.

Please contact your local Piper Field Service Facility to make arrangements for compliance with the provisions of this Service Release in accordance with Compliance Time, above.



FLAP INDICATOR

SKETCH A

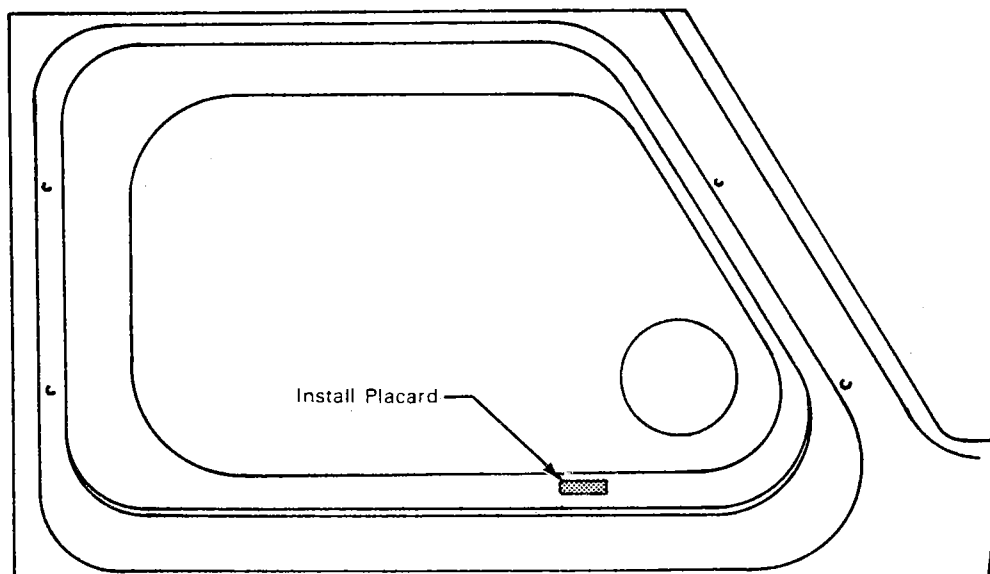


FLAP SETTINGS IN EXCESS OF 15° ARE NOT APPROVED.  
INCREASE LANDING DISTANCE BY 15% WITH USE OF 15° FLAPS.  
APPROACH AT 103 KTS / 119 MPH (CAS), 109 KTS / 125 MPH (CAS)  
WITH SAS OVERRIDE ON.  
NO FLAP SELECTION WITH AUTOPILOT ENGAGED.

FOR: PA-31T Serial Nos. 31T-7400002 to 31T-7500013 Incl.

Cut Out And Attach Placard To Pilot's Window Moulding As Shown In Sketch Above.

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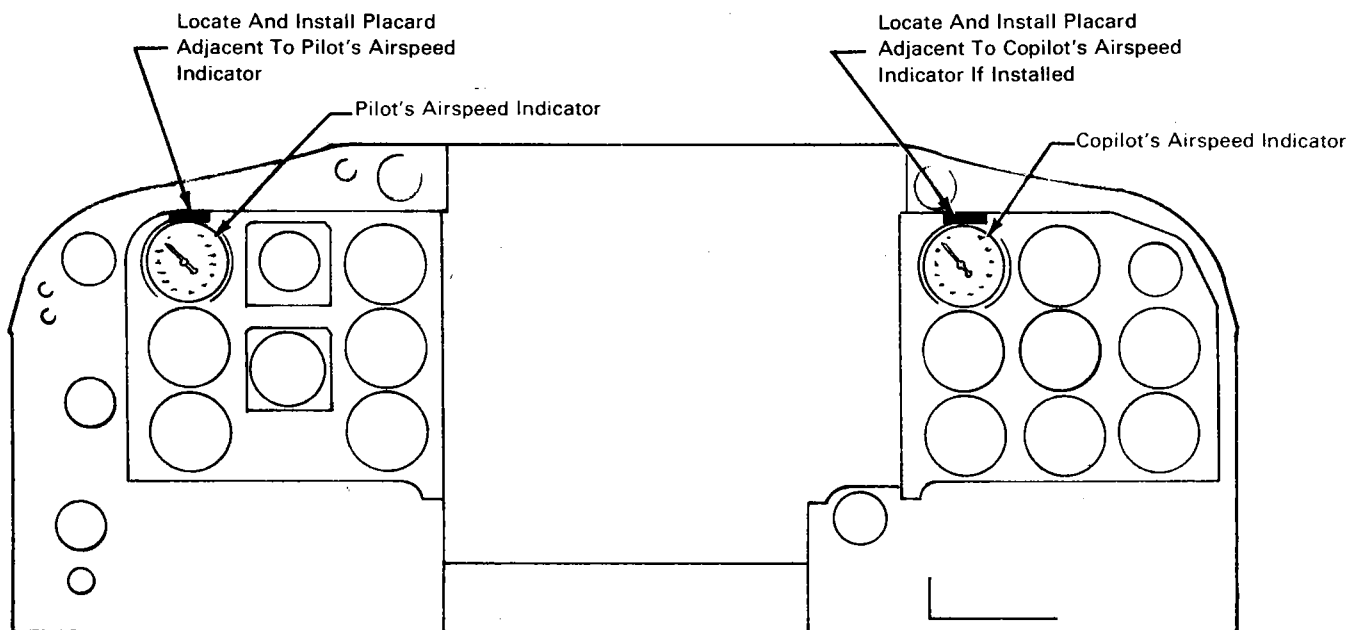


NO FLAP SELECTION WITH  
AUTOPILOT ENGAGED

FOR: PA-31T Serial Nos. 31T-7500014 to 31T-7820066, 31T-7820068.  
PA-31T1 Serial Nos. 31T-7804001 to 31T-7804011 incl.

Cut Out And Attach Placard To Pilot's Window Moulding As Shown In Sketch Above.

SKETCH B



**STALL SPEED 92 MPH / 80 KT  
WITH 15° FLAPS**

**STALL SPEED 92 MPH / 80 KT  
WITH 15° FLAPS**

FOR: PA-31T Serial Nos. 31T-7400002 to 31T-7500013 Incl.

Cut Out And Attach Placard(s) To Instrument Panel  
Adjacent To Airspeed Indicator(s) As Shown Above.

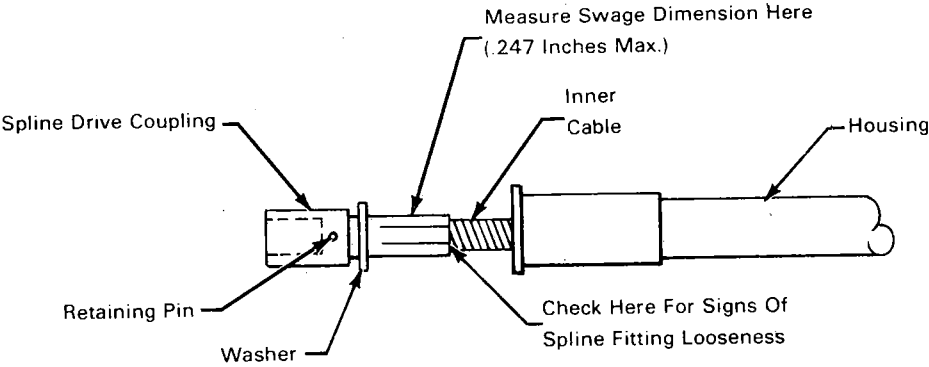


FIGURE 2

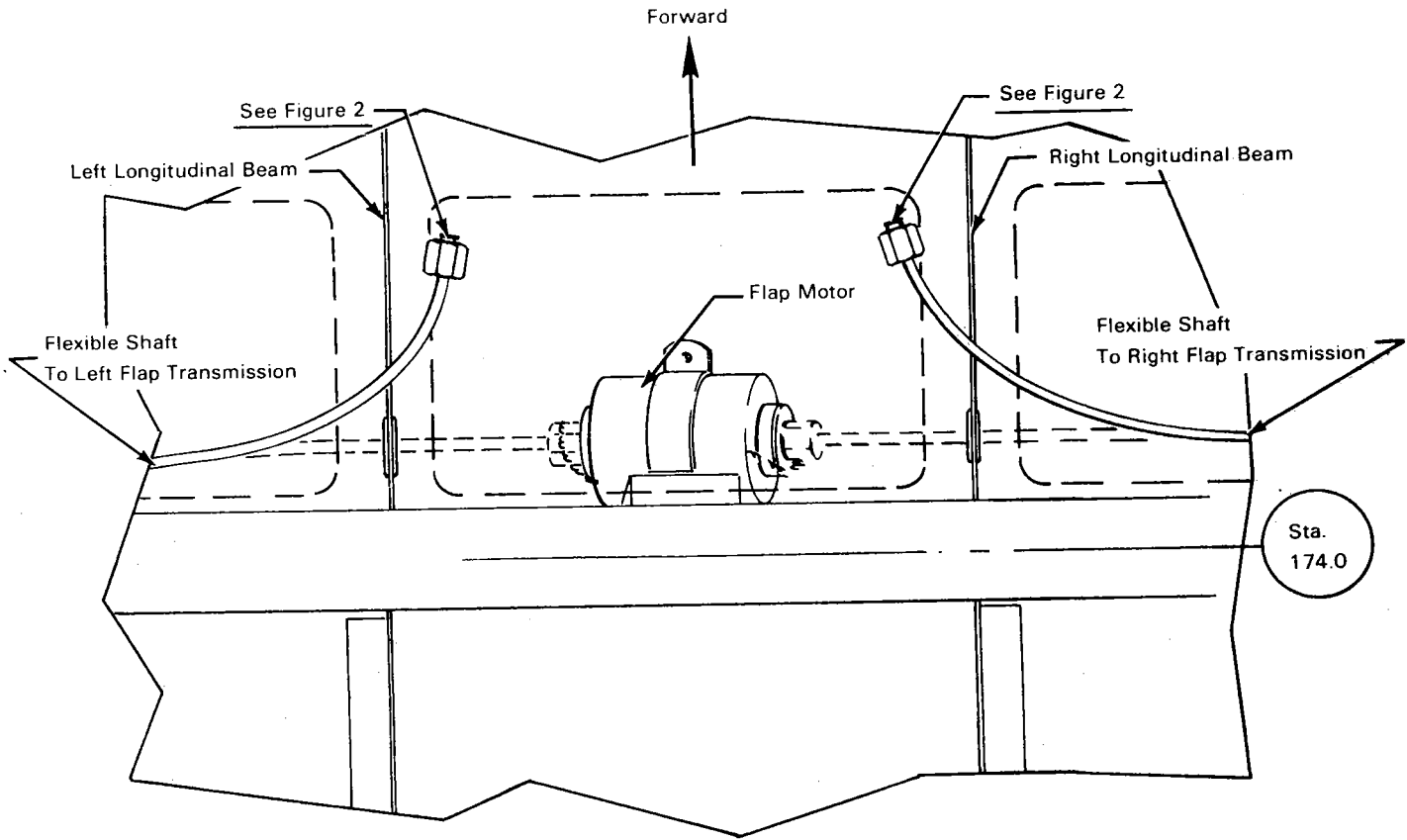


FIGURE 1

SKETCH D

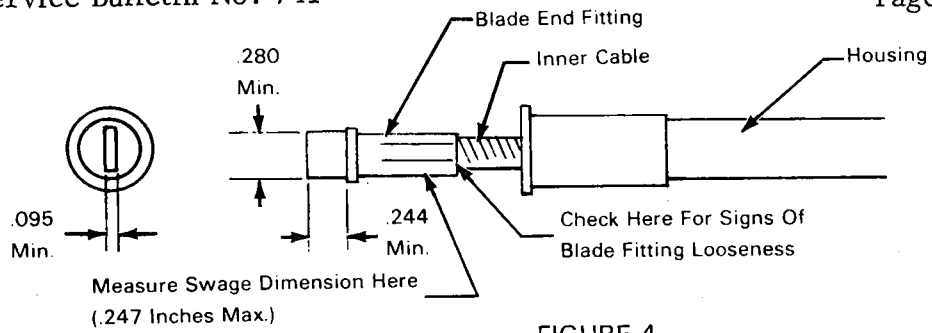


FIGURE 4

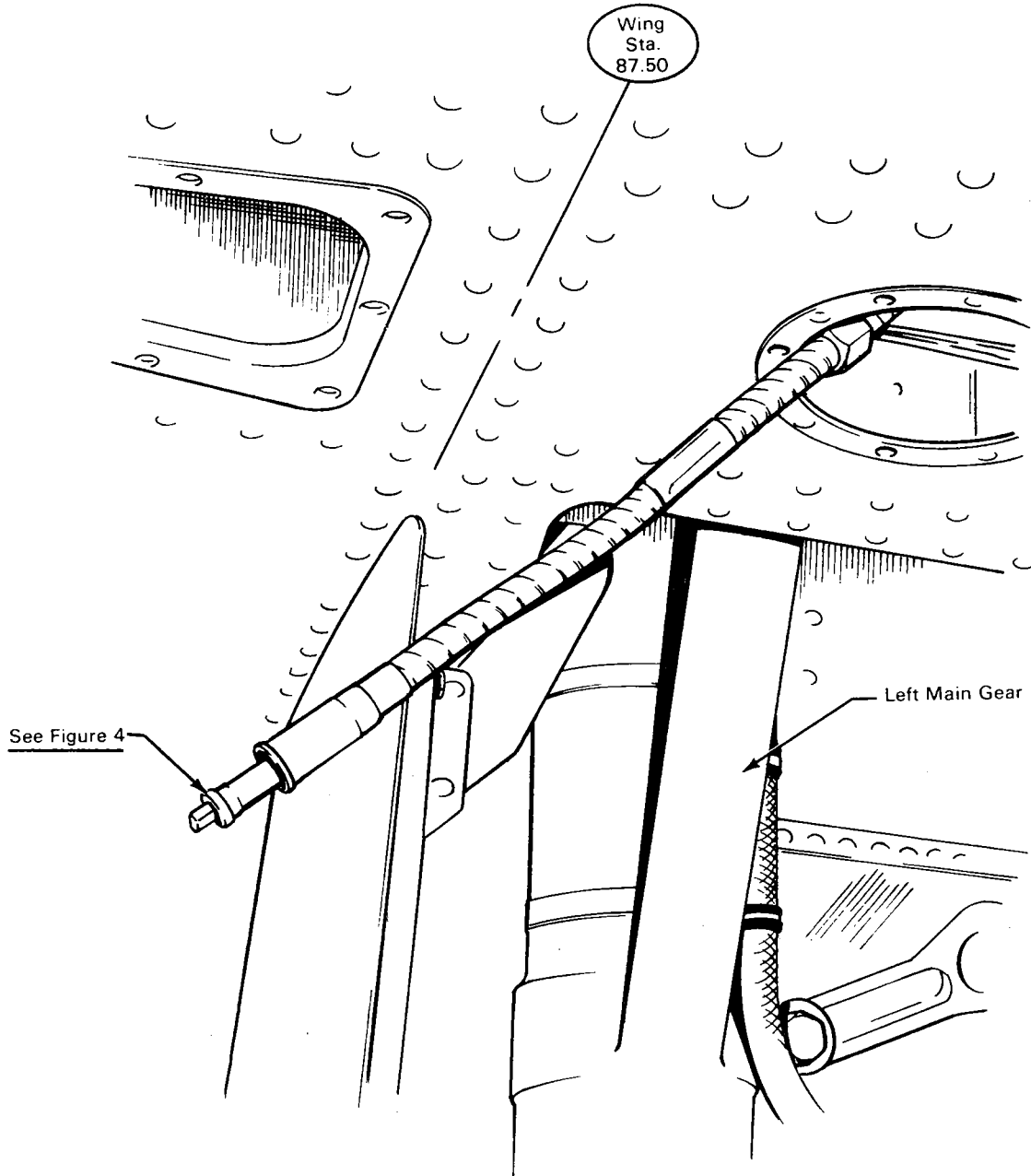


FIGURE 3

Left Wing Shown - Right Wing Opposite

SKETCH E

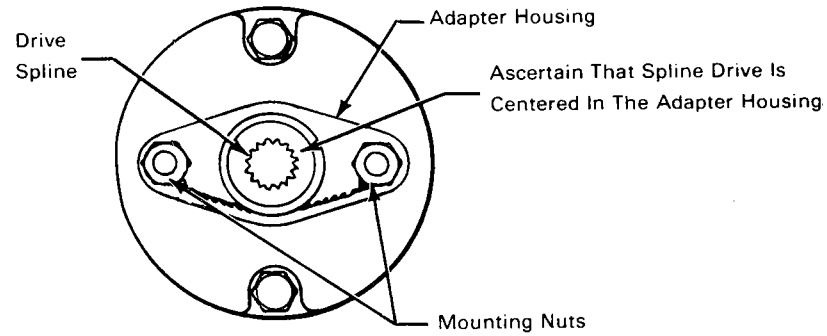


FIGURE 6

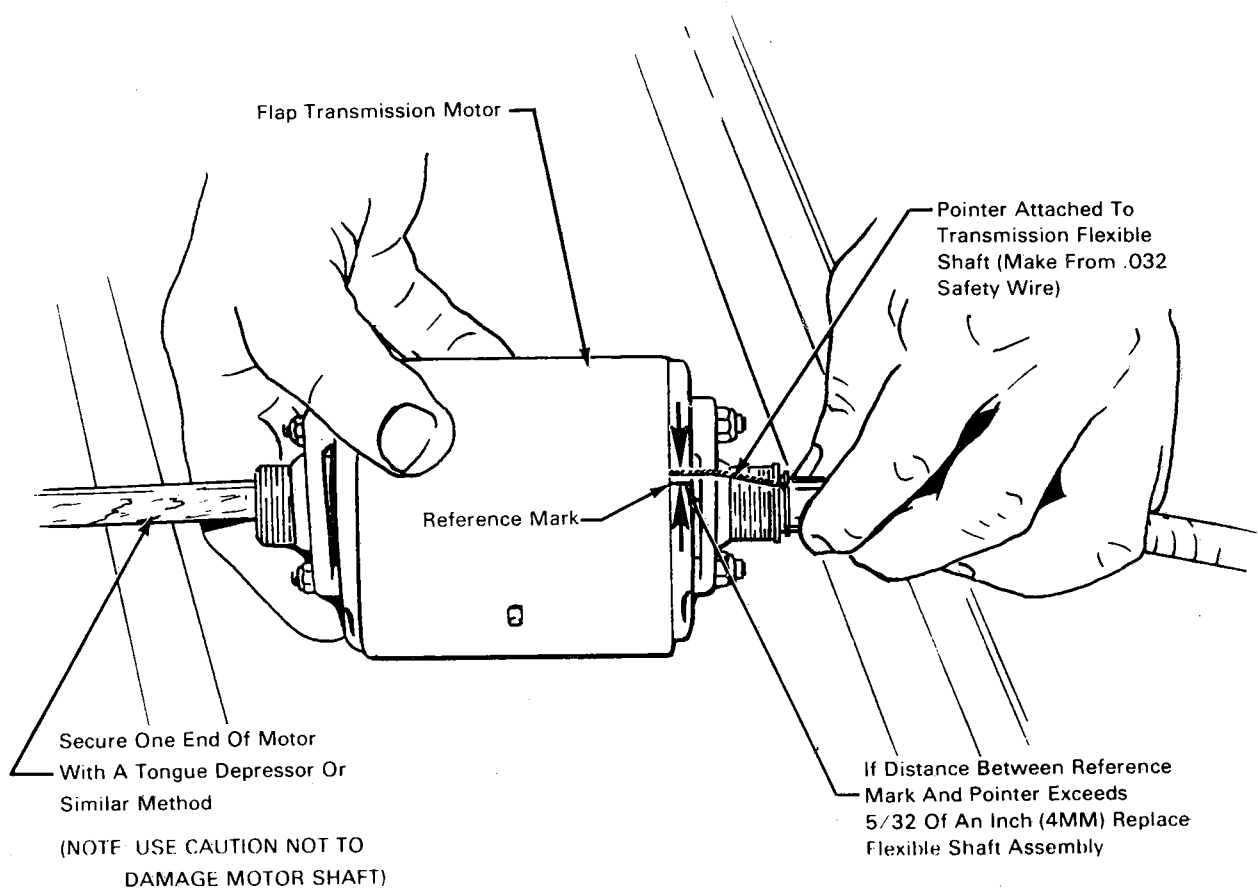


FIGURE 5

SKETCH F



BULLETIN SUPPLEMENT --- PROCEDURAL OPERATING INFORMATION

Material Allowance:

For PA-31T aircraft Serial Nos. 31T-7400002 through 31T-7520013 only:

For PART I. C. One (1) each per aircraft Wing Flap Transmission Modification Kit, Piper Part No. 764 398.

Comply with Product Condition/Compliance Report procedure.

Labor Allowance:

For PA-31T aircraft Serial Nos. 31T-7400002 through 31T-7520013 only:

Up to five (5) hours per aircraft for installation of Wing Flap Transmission Modification Kit, Piper Part No. 764 398.

Comply with Product Condition/Compliance Report procedure.

Disposition of Replaced Parts:

Not Applicable.

Disposition of Parts in Stock:

Not Applicable.

NOTE: Kit 764 398 will be available for shipment from the factory on or before June 1, 1982.