



SERVICE LETTER

No. 789

Piper Aircraft Corporation

Lock Haven, Pennsylvania, U.S.A.

October 6, 1977

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Subject: Inspection of Elevator Bellcrank and Elevator Control Rod

Models Affected:

Serial Numbers Affected:

PA-31, PA-31-300 and	
PA-31-325 Navajo	31-2 to 31-7712034 Inclusive;
PA-31-350 Navajo Chieftain	31-5001 to 31-7752059 Inclusive;
PA-31P Pressurized Navajo	31P-1 to 31P-7730003 Inclusive;
PA-31T Cheyenne	31T-7400002 to 31T-7720017 Inclusive.

Compliance Time: At owner/operator's discretion, recommended at the next regularly scheduled inspection period (100 Hour, Annual or Programmed Inspection Event, whichever applies).

Purpose: A need exists in the field for detailed inspection information relative to the elevator bellcrank and elevator control rod installation on the above referenced aircraft. This Service Release provides information to inspect the elevator bellcrank mounting bracket for bellcrank attachment bolt hole elongation and to check elevator bellcrank center and end bearings for proper operating and fit (rotation, radial and axial play and tolerances).

Instructions: Refer to attachment entitled "Inspection of Elevator Bellcrank Bearings and Elevator Control Rod End Bearing".

Material Required: Refer to attachment relative to material replacements necessitated by inspection procedures.

Availability of Parts: Your Piper Field Service Facility.

Effectivity Date: This Service Release is effective upon receipt.

Summary: Please contact your Piper Field Service Facility to make arrangements to incorporate the provisions of this Service Release on your aircraft as recommended in Compliance Time, above. This Service Release supplements existing published inspection procedures and service manual data.

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INSPECTION OF ELEVATOR BELLCRANK BEARINGS
AND ELEVATOR CONTROL ROD END BEARING

1. Remove bottom half of tail cone and side access plates from aft fuselage to gain access to the elevator bellcrank and elevator control rod.
2. Disconnect control cables from elevator bellcrank.
3. Disconnect the bungee spring link from the rear section of the elevator control rod.
4. Disconnect the elevator control rod from the bellcrank and elevator torque tube horn.
5. Remove the bellcrank from the mounting brackets.
6. Inspect the .312/.314 hole in the bellcrank mounting brackets for possible hole elongation. Refer to Detail "A" on sketch.
7. If holes are elongated in either of the bellcrank mounting brackets, it will be necessary to remove existing bracket(s) and install new bracket P/N 40704-00 (left) and/or P/N 40704-01 (right) as required. Refer to Detail "A" on sketch and proceed as follows:
 - a. Remove bracket(s) by drilling out attachment rivets. Do not enlarge rivet holes.
 - b. Position new bracket(s), align rivet holes and secure with temporary fasteners. Check the alignment of the bellcrank mounting holes.
 - c. Back drill holes in new bracket(s) to .129 and install new rivets per Detail "A". Clean area of all drill chips.
8. Check rotation of center bearings in the elevator bellcrank using the following procedure:
 - a. Install AN5-25 bolt through center bearings, add AN315-5R nut or equivalent, and torque to 60-85 in. lbs. This assembly must meet the following requirements:
 1. Bearings must rotate freely 360°.
 2. Assembly must rotate freely, approximately 180°, from position "A" to position "B" while suspended and supported by the bolt head and nut. Refer to Detail "C" on sketch.
 - b. If preceding requirements can not be met, refer to Detail "B" on sketch and proceed as follows:
 1. Place a .562 I.D. x .688 O.D. bushing (or equivalent) on outer race of both center bearings.
 2. Place a "C" clamp on bushings and compress outer race until bearings rotate freely.
 3. If bearings will not rotate freely, it will be necessary to replace existing bellcrank assembly with new assembly P/N 40307-00.
9. Check radial and axial play in the end bearing on the elevator bellcrank to determine if it exceeds the maximum tolerance. Tolerance may be hand estimated or measured with a dial indicator.
 - a. Maximum radial clearance is .005.
 - b. Maximum axial clearance is .015.
 - c. If bearing tolerance exceeds the maximum radial or axial clearance, it will be necessary to replace existing bearing with new bearing P/N 49265-02. Refer to Detail "B" on sketch and proceed as follows:

1. Place a .750 I.D. x 1.00 O.D. bushing (or equivalent) against bellcrank surface and a .500 I.D. x .625 O.D. bushing (or equivalent) against bearing race.
2. Press out existing bearing and install new bearing P/N 49265-02.
Stake bellcrank surface four places on both sides to retain bearing.
10. Check radial and axial play in the rod end bearing on the elevator control rod to determine if it exceeds the maximum tolerance. Tolerance may be hand estimated or measured with a dial indicator.
 - a. Maximum radial clearance is .005.
 - b. Maximum axial clearance is .015.
 - c. If bearing tolerance exceeds the maximum radial or axial clearance, it will be necessary to replace existing rod end bearing assembly with new assembly P/N 49261-02.
11. Lubricate spherical bearing on elevator bellcrank. Position bellcrank between mounting brackets and install pivot hardware. Discard castle nut and cotter pin. Install new MS20365-524C nut and torque to 60-85 in. lbs.

NOTE

If existing pivot bolt is worn or damaged, install new AN5-25A bolt.

12. Lubricate rod end bearing on elevator control rod. Reinstall the control rod by attaching to bellcrank and elevator torque tube horn using existing hardware.
13. Attach the elevator bungee spring link to the rear of the elevator control rod using existing hardware.
14. Connect the control cables to the bellcrank using existing hardware.
15. Check rigging and adjustment of elevator controls per the appropriate Service Manual.
16. Inspect all connections for security.
17. Re-install access plates and bottom half of tail cone to the aft fuselage.
18. Make proper log book entry of Service Letter compliance.

Inspect $\frac{.312}{.314}$ Hole

In Left and Right
Bracket for Hole Elongation.



Rivet - MS20470AD4-4
(3 Req. per bracket)

Rivet - MS20470A1
(9 Req. per bracket,

Fuselage Bulkhead
(Station 317.75)

Rivet - MS20470AD4-4
(4 Req. per bracket)

Right Bracket - P/N 40704-01

Left Bracket - P/N 40704-00

DETAIL "A"

Bushing - 2 Req.
(.562 I.D. x .688 O.D.)

.19 Stake

Bushing
(.750 I.D. x 1.00 O.D.)

Bushing
(.500 I.D. x .625 O.D.)

DETAIL "B"

Bolt - AN5-25
Nut - AN315-5R or equivalent

Approx.
Level

Position "A"

Position "B"

DETAIL "C"