

SERVICE BULLETIN

Beech**ATA Code 27-20**

TITLE: FLIGHT CONTROLS - RUDDERVATOR DIFFERENTIAL TAIL CONTROL ROD ASSEMBLY INSPECTION/MODIFICATION

SYNOPSIS OF CHANGE

This Service Bulletin has been revised and is produced in the new Raytheon Aircraft Company Service Bulletin format. It supersedes and cancels Service Bulletin No. 2668, Rev. 1. Relevant technical changes are marked with change bars in the outside margins. Rod End P/N AHM4-1006 has been sold as a substitute for MD46-15. A note has been added in the Accomplishment Instructions to clarify the disposition of these Rod Ends if installed. If this Service Bulletin has been accomplished no further action is required.

1. Planning Information

A. Effectivity

(1) Airplanes

Bonanza Models 35, 35R, A35, B35, C35, D35, E35, F35, G35, H35, J35, K35, M35, N35, P35, S35, V35, V35TC, V35A, V35A-TC, V35B, and V35B-TC, serials D-1 through D-10403, D-15001 and D-15002.

If you are no longer in possession of this airplane, please forward this information to the present owner.

(2) Spares

Rod End P/N 131765-3M;

Rod End P/N MD46-15;

Rod End P/N AHM4-1006;

Differential Tail Control Rod Assembly P/N 35-524306;

Differential Tail Control Rod Assembly P/N 35-524306-8.

Raytheon Aircraft Company (RAC) issues Service Information for the benefit of owners and fixed base operators in the form of two classes of Service Bulletins. The first class, Mandatory Service Bulletins (red border) includes changes, inspections and modifications that could affect safety or crashworthiness. RAC also issues Service Bulletins with no red border which are designated as either recommended or optional in the compliance section within the bulletin. In the case of recommended Service Bulletins, RAC feels the changes, modifications, improvements or inspections will benefit the owner/operator and although highly recommended, Recommended Service Bulletins are not considered mandatory at the time of issuance. In the case of Optional Service Bulletins, compliance with the changes, modifications, improvements or inspections is at the owner/operator's discretion. Both classes are mailed to:

(a) RAC Authorized Service Centers.

(b) Owners of record on the FAA Aircraft Registration Branch List and the RAC International Owner Notification/Registration Service List.

(c) Those having a publications subscription.

Information on Owner Notification Service or subscription can be obtained through any RAC Authorized Service Center. As Mandatory Service Bulletins and Service Bulletins are issued, temporary notification in the Service Bulletin Master Index should be made until the index is revised. Warranty will be allowed only when specifically defined in the Service Bulletin and in accordance with the RAC Warranty Policy.

Unless otherwise designated, RAC Mandatory Service Bulletins, Service Bulletins and RAC Kits are approved for installation on RAC airplanes in original or RAC modified configurations only. RAC Mandatory Service Bulletins, Service Bulletins and Kits may not be compatible with airplanes modified by STC installations or modifications other than RAC approved kits.

**Raytheon Aircraft****Beech
Hawker**

Issued: September, 1996
Revised: December, 1998

SB 2668, Rev. 2

1 of 9



SERVICE BULLETIN

B. Reason

Each differential tail control rod assembly has two rod ends which are installed in the ends of the assembly. These rod ends (with the exception of P/N AHM4-1006) have a hollow shaft which is open at both ends and extends through the length of the rod end. It appears that through the process of the rod assembly "breathing", moisture laden air enters the rod assembly through the hollow shaft in the rod ends and condenses in the rod assembly tube. The accumulation of moisture in the assembly tube, in the presence of freezing temperatures, may cause the tube to split and possibly lead to the ruddervator not operating properly.

C. Description

This Service Bulletin is being issued to inspect the two existing P/N 35-524106 or P/N 35-524106-8 ruddervator differential tail control rod assemblies for moisture and corrosion, repair or replace the assemblies (if necessary), seal the assemblies against moisture intrusion, and reidentify the modified assemblies.

NOTE

In 1981, Service Instructions (SI) No. 0989 was issued to address internal corrosion of the ruddervator differential tail control rod assemblies. SI No. 0989 directed that an inspection and anti-corrosion treatment be performed on the rod assemblies, but did not seal the rod ends to prevent the intrusion of moisture into the rod assembly tubes. Irrespective of prior compliance with SI No. 0989, this Mandatory Service Bulletin (No. 2668) must be accomplished.

D. Compliance

Raytheon Aircraft Company considers this to be a mandatory modification and it must be accomplished as soon as possible after receipt of this Service Bulletin, but no later than the next scheduled inspection.

Airworthiness Directive No. 97-06-11 has been issued on the matter covered by this Service Bulletin.

E. Approval

The engineering data contained in this Service Bulletin is FAA approved.

This revision of Service Bulletin No. 2668 is an FAA approved alternate means of compliance for the requirements of paragraphs (a) and (b) of Airworthiness Directive No. 97-06-11.

F. Manpower

The following information is for planning purposes only:

Estimated man-hours to inspect and replace: 2 hours.

Estimated man-hours to inspect/seal/reidentify: 2 hours.

Suggested number of men: 1 man.

The above is an estimate based on experienced, properly equipped personnel complying with this Service Bulletin. Occasionally, after work has started, conditions may be found which could result in additional man-hours.

SERVICE BULLETIN

G. Weight and Balance

None.

H. Electrical Load Data

Not changed.

I. Software Accomplishment Summary

Not applicable.

J. References

FAA Aircraft Inspection and Repair Manual, P/N AC43.13-1A, Paragraph 300;

Model 35 Shop Manual, P/N 35-590096B18 or subsequent, Section 3;

Bonanza 33, 35, 36 Series Maintenance Manual, P/N 36590001-9A17 or subsequent, Chapter 27-21;

Bonanza Illustrated Parts Catalog for Models H35 through V35A-TC, P/N 35-590015C5 or subsequent;

Bonanza Illustrated Parts Catalog for Models 35 through G35, P/N 35-590028B4 or subsequent;

Bonanza Illustrated Parts Catalog for Models V35B, P/N 35-590102E4 or subsequent.

K. Publications Affected

It is recommended that a note "See Service Bulletin No. 2668, Rev. 2" be made in the following:

Model 35 Shop Manual, P/N 35-590096B18 or subsequent, Section 3;

Bonanza 33, 35, 36 Series Maintenance Manual, P/N 36590001-9A17 or subsequent, Chapter 27-21;

Bonanza Illustrated Parts Catalog for Models H35 through V35A-TC, P/N 35-590015C5 or subsequent;

Bonanza Illustrated Parts Catalog for Models 35 through G35, P/N 35-590028B4 or subsequent;

Bonanza Illustrated Parts Catalog for Models V35B, P/N 35-590102E4 or subsequent.

L. Interchangeability of Parts

Not applicable.

M. Warranty Credit

None.

2. Material Information

A. Materials - Price and Availability

Contact a Raytheon Aircraft Authorized Service Center for information.

B. Industry Support

Not applicable.

SERVICE BULLETIN

C. Airplanes

- (1) The following parts required for this modification may be ordered through a Raytheon Aircraft Authorized Service Center. Some of the materials may be obtained locally.

Part Number	Description	Quantity Per Airplane
35-524106-11 (*) or 35-524106-13 (**)	Differential Tail Control Rod Assembly	As Required
35-524106-2 (*) or 35-524106-6 (**)	Tube	As Required
131765-8M (***) or 35-524106-9 (***)	Rod End	As Required
AN316-6R	Nut	As Required

(*) Serials D-1 through D-5725.

(**) Serials D-5726 through D-10403, D-15001, and D-15002.

(***) It is permissible to mix or match P/N 131765-8M and P/N 35-524106-9 rod ends on the same differential tail control rod assembly.

- (2) The following materials may be obtained locally:

Part Number	Description	Quantity Per Airplane
MIL-S-8802, Class B	Sealant (i.e. PR-1440, Pro Seal 890 B-1/2, MC 236)	As Required
MIL-C-38736 or equivalent (****)	Solvent	As Required
MIL-C-16173, Grade 2	Corrosion Preventative Compound (i.e. Braycote 137)	As Required
MIL-C-22750 (FED-STD-595, Color No. 12246) or equivalent	Orange Epoxy, Enamel, or Polyurethane Paint	As Required
MIL-G-23827	Grease (i.e. Aeroshell 7)	As Required

SERVICE BULLETIN

Part Number	Description	Quantity Per Airplane
MIL-P-23377	Epoxy Polyamide Primer	As Required
TT-N-95, Type II	Naptha (Aliphatic)	As Required
P-D-680, Type I	Mineral Spirits	As Required
MIL-C-5541	Alodine 1200	As Required

(****) MEK or MPK may be used as an alternative.

D. Spares

(1) The following materials may be obtained locally:

Part Number	Description	Quantity Per Airplane
MIL-S-8802, Class B	Sealant (i.e. PR-1440, Pro Seal 890 B-1/2, MC 236)	As Required
MIL-C-38736 or equivalent (****)	Solvent	As Required
MIL-C-16173, Grade 2	Corrosion Preventative Compound (i.e. Braycote 137)	As Required
MIL-C-22750 (FED-STD-595, Color No. 12246) or equivalent	Orange Epoxy, Enamel, or Polyurethane Paint	As Required
MIL-G-23827	Grease (i.e. Aeroshell 7)	As Required
MIL-P-23377	Epoxy Polyamide Primer	As Required
TT-N-95, Type II	Naptha (Aliphatic)	As Required
P-D-680, Type I	Mineral Spirits	As Required
MIL-C-5541	Alodine 1200	As Required

(****) MEK or MPK may be used as an alternative.

Raytheon Aircraft Company expressly reserves the right to supersede, cancel and/or declare obsolete, without prior notice, any parts or publications that may be referenced in this Service Bulletin.

E. Tooling - Price and Availability

Not applicable.

SERVICE BULLETIN

3. Accomplishment Instructions

This Service Bulletin shall be accomplished as follows:

NOTE

Should any difficulty be encountered in accomplishing this Service Bulletin, contact Raytheon Aircraft Company at 1-800-625-7043 or 316-676-4556

A. Airplane

WARNING

Observe all Warnings and Cautions contained in the aircraft manuals referred to in this Service Bulletin.

Whenever any part of this system is dismantled, adjusted, repaired or renewed, detailed investigation must be made on completion to make sure that distortion, tools, rags or any other loose articles or foreign matter that could impede the free movement and safe operation of the system are not present, and that the systems and installations in the work area are clean.

- (1) Remove all power from the airplane and disconnect the battery. Display warning notices prohibiting reconnection of airplane electrical power.
- (2) Accomplish the following using Figure 1 for reference.
- (3) Remove the tail cone and any access covers/panels required to gain access to the two ruddervator differential tail control rod assemblies.
- (4) Inspect all four (4) rod ends for P/N identification and refer to the following note.

NOTE

It is not necessary to modify P/N 131765-8M, P/N 35-524106-9 rod ends (that have a sealed shaft) or P/N AHM4-1006 rod ends (which have a solid shaft) that have been installed on either differential control rod assembly. However, they will need to be inspected for cracks and corrosion in accordance with step 10. Proceed with the following steps for other parts affected.

- (5) Identify by left and right location and remove the existing P/N 35-524106 or P/N 35-524106-8 differential tail control rod assemblies.
- (6) Accurately measure and record the length of each rod assembly. The measurement is taken from the center of one rod end bolt hole to the center of the other rod end bolt hole.
- (7) Loosen the nuts and remove the rod ends from each rod assembly.
- (8) Remove the nuts from the rod ends.
- (9) Thoroughly clean the rod ends, nuts, and the interior and exterior of the rod assembly tubes with P/N MIL-S-38736 solvent and allow to dry.

SERVICE BULLETIN

- (10) Inspect the rod ends, nut, and tubes for cracks and corrosion in accordance with the dye penetrant procedures listed in the P/N AC43. 13-1A FAA Aircraft Inspection and Repair Manual, paragraph 300.
- (11) Smooth any minor nicks, dents, and scratches that are less than 0.010 inch deep. Apply P/N MIL-C-5541 Alodine 1200 to any areas of bare metal and prime with P/N MIL-P-23377D, Type I epoxy polyamide primer.
- (12) If cracks or corrosion are found or the threads are damaged, reference the MATERIAL section and replace the affected part.

NOTE

If a complete rod assembly is required, obtain the new assembly (listed in the MATERIAL section) and adjust the rod ends to obtain the length of the original rod assembly (step 6). Tighten the nuts to secure the rod ends and proceed to step 20 to complete the instructions for the new rod assembly.

NOTE

It is permissible to mix or match P/N AHM4-1006, P/N 131765-8M and P/N 35-524106-9 rod ends on the same differential tail control rod assembly.

- (13) If no cracks or corrosion are found in the tubes, perform the following:
 - (a) Blow clean, dry, filtered shop air through each tube to remove all moisture.
 - (b) Fill the interior of each tube with P/N MIL-C-16173, Grade 2 corrosion preventative compound diluted with enough P/N TT-N-95, Type II aliphatic naphtha or P/N P-D-680 mineral spirits to allow flowability. Drain off the excess solution and allow to dry.
- (14) If no cracks or corrosion are found in the rod ends perform the following steps using Detail C for reference:
 - (a) Clean the hollow shaft in each rod end with solvent and allow to dry.
 - (b) Fill the hollow shaft with P/N MIL-S-8802, Class B sealant and allow to cure.
 - (c) After the sealant has cured, lubricate the ball and groove in the rod end insert with P/N MIL-G-23827 grease.
 - (d) Reidentify the modified rod end as P/N 35-524106-9 using an indelible marker.
- (15) Apply P/N MIL-C-22750 orange epoxy, enamel, or polyurethane paint to the first two inches of each tube end and allow to dry. If corrosion preventative compound is present when the paint is to be applied, remove it with P/N MIL-C-38736 solvent before painting.

NOTE

The application of orange paint to the rod assembly tube provides a readily identifiable indication that the tube has been treated with corrosion preventative compound and that the rod ends have been sealed.

- (16) Install the nuts on the rod ends.

SERVICE BULLETIN

- (17) Lubricate the rod end threads with corrosion preventative compound and install the rod ends in the rod assembly tube.

CAUTION

In order to insure adequate thread engagement, be sure that the rod end threads are visible in the rod assembly tube inspection holes (located at both ends of the tube) after the rod ends have been adjusted to obtain the recorded length. If the inspection holes are not present, be sure that the engaged rod end does not extend more than 1 5/8 inches past the end of the tube (distance is measured from the end of the tube to the center of the rod end insert).

- (18) Adjust the rod ends until the rod assembly is the same length recorded in step 6.
- (19) Tighten the nuts to secure the rod ends.
- (20) Reidentify the modified rod assemblies using an indelible marker as follows:
- (a) The modified P/N 35-524106 rod assemblies become P/N 35-524106-11 rod assemblies.
 - (b) The modified P/N 35-524106-8 rod assemblies become P/N 35-524106-13 rod assemblies.
- (21) Install the rod assemblies per the left and right identification established in step 5.
- (22) Operate the ruddervator controls to insure proper operation of the differential tail control rod assemblies and the ruddervator.
- (23) Install the tail cone and any access panels/covers that were removed to facilitate this Service Bulletin.
- (24) Reconnect the airplane battery, remove warning notices and restore power.
- (25) Ensure all work areas are clean and clear of tools and miscellaneous items of equipment.
- (26) Return airplane to service.

B. Spares

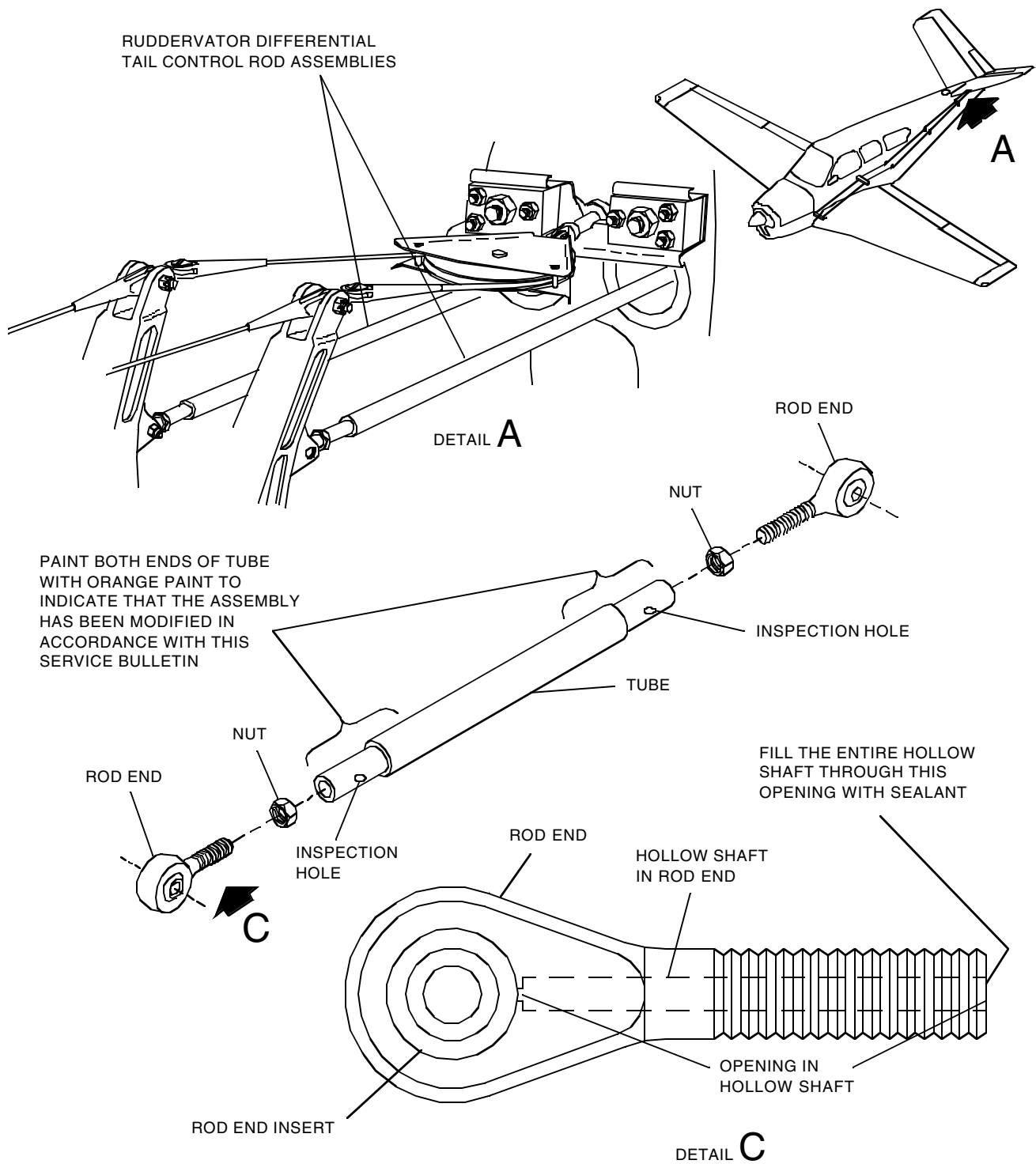
Remove all P/N 131765-3M rod ends from stock. Modify and reidentify the rod ends in accordance with step 13 of the Accomplishment Instructions. Refer to Figure 1 as required. Return the reidentified rod ends to stock. If Rod End P/N AHM4-1006 is found in stock, modification to it is not necessary.

Remove all P/N 35-524306 and P/N 35-524306-8 differential tail control rod assemblies from stock. Modify and reidentify the rod assemblies in accordance with steps 6 through 9 and steps 13 through 20 of the Accomplishment Instructions. Refer to Figure 1 as required. Return the reidentified rod assemblies to stock.

C. Record of Compliance

Upon completion of this Service Bulletin, make an appropriate maintenance record entry.

SERVICE BULLETIN



Ruddervator Differential Tail Control Rod Assembly
Figure 1