

SERVICE BULLETIN No: 105
 REVISION: A, 3 Aug 05. (Prepared 2 Aug 05)
 SUBJECT: Tail Drive System Inspection
 SHIPS AFFECTED: See below
 TIME OF COMPLIANCE: Within the next 10 hours TIS. See below for details.
 FAA APPROVAL: This Service Bulletin is FAA approved.

Introduction

Brantly has had reports of failures of the 'shaft upper tail rotor' (p/n 249-10). The purpose of this service bulletin is to inspect the condition of the shaft and parts in that assembly. The inspections are separated into two parts. Part one contains one-time inspections that must be repeated only under certain circumstances. Part two contains inspections that must be repeated periodically and under certain circumstances. See the inspections for specifics.

NOTE 1	Always use the latest revision of any Brantly documentation. Consult the factory for a list of the current revisions for each document. Service Instructions (SI) are intended to be incorporated in a future revision of the maintenance manual. At which time, the Service Instructions are superceded.
NOTE 2	At this time, there is no approved procedure for an eddy current type inspection of any Brantly parts.
NOTE 3	The inspections described in this Service Instruction are in addition to any and all other inspections in other Brantly service documents unless otherwise specified.

Ships affected

Models B-2, B-2A, or B-2B that meet at least one of the following criteria:

- 1) Serial number 2001 and up.
- 2) Shaft p/n 249-10 purchased after 1994.

Special Tools

- For linear dimensions in this bulletin written with 4 decimal places, use a calibrated micrometer (or equal) with an accuracy of at least ± 0.0001 inches. For all other linear dimensions, use calibrated calipers (or equal) with an accuracy of at least ± 0.001 inches. The factory may provide a service to measure components. Contact the factory for details. All dimensions are in inches unless otherwise specified.
- To measure the angle in inspection item #2.7, use a calibrated protractor with a display resolution of at least 0.1° and an accuracy of $\pm 0.1^\circ$ or better.
- To measure the force in inspection #2.7, use a calibrated instrument (ex. force gauge) with an accuracy of ± 0.25 lbs or better.

Inspections and Corrective Actions

The inspections are listed in the following table. There is a space to record the actual measurement taken, whether the part passed or failed the inspection, and what corrective action was taken. In order to help us keep track of any service difficulties, please fax this completed form to Brantly: 940-552-2703. If any part must be replaced as a result of this service bulletin, we kindly request that you please return the old part to the factory for inspection. Please include with the part a copy of all pertinent documents and information such as time in service. Contact the factory for details.

INSPECTION REPORT FOR SB-105 – PART 2 - Sheet 1/4

SHIP S/N	Reg No.	Ship Hours TTIS	Date
278-200 S/N	278-200 Hours TTIS	Email	
Name	Tel.		
Address			

PART 2 – Inspect the following within the next 10 hours TIS (time in service), then again every 200 hours thereafter. Inspect also immediately after a hard landing or tail rotor sudden stoppage.

2.1 Bevel Pinion p/n 15-8: Using a suitable inspection light, visually inspect the bevel pinion gear, paying particular attention to the bore, for nicks, scoring, excessive wear, bolt hole elongation, burrs, and evidence of misalignment. Damage is acceptable only if it can be removed with light hand polishing using Scotch Brite (maroon or white) and maintaining all tolerances and a 32 rms finish. If any damage remains then replace with a new airworthy part. When removing the part from the ship, if its condition leads you to suspect that the part has operated under a misaligned condition then contact the factory for further evaluation. Measure the dia of the bolt hole. Size must be \varnothing .1894 to \varnothing .1899 inches. Measure the bore dia. Size must be \varnothing .6248 to \varnothing .6250 inch. If the part fails inspection, replace with a new airworthy part.

Result:

2.2 Bolt p/n 15-201: This bolt inserts into the pinion (p/n 15-8). Check for excessive wear or damage where bolt contacts the shaft. Measure the grip dia. Size must be .1889 to .1894 inch. If the part fails inspection, replace with a new airworthy part.

Result:

2.3 Male Coupling p/n 249-9: Using a suitable inspection light, visually inspect the male coupling, paying particular attention to the bore, for nicks, scoring, excessive wear, bolt hole or keyway elongation, burrs, and evidence of misalignment. Damage is acceptable only if it can be removed with light polishing using Scotch Brite (maroon or white) and maintaining all tolerances and a 32 rms finish. If any damage remains then replace with a new airworthy part. When removing the part from the ship, if its condition leads you to suspect that the part has operated under a misaligned condition then contact the factory for further evaluation. Measure the bolt hole dia. Size must be \varnothing .1894 to \varnothing .1899 inch. Measure the bore dia. Size must be .6250 to .6260 inch. If the part fails inspection, replace with a new airworthy part.

Result:

2.4 Bolt p/n 249-11: This bolt inserts into the male coupling (p/n 249-9). Check for excessive wear or damage where bolt contacts the shaft. Measure the grip dia. Size must be .1889 to .1894 inch. If the part fails inspection, replace with a new airworthy part.

Result:

INSPECTION REPORT FOR SB-105 – PART 2 - Sheet 3/4

SHIP S/N	Reg No.	Ship Hours TTIS	Date
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2.6 Tail Rotor Gearbox Assembly (p/n 278-200): Assemble the (upper) tail rotor gearbox assembly (p/n 278-200). Add the housing (p/n 249-3). Check the internal alignment of the shaft (p/n 249-10) as follows: Position the assembly such that the shaft is horizontal. The cone end of the male coupling must rest, under its own weight, within .031 inches or below the center of the housing (p/n 249-3) along a vertical line. Repeat the check in at least 4 equally spaced positions when you roll the entire assembly along the shaft axis. The mid-span bearing (p/n 108-64) is part of only some helicopter configurations. If it is part of the ship being inspected then perform the internal alignment check both with and without the bearing installed. If the assembly fails this check then the problem must be found and corrected or the entire assembly must be replaced with an airworthy assembly. Contact the factory if you need assistance. (Ref. SI-10 “Upper Tail Rotor Gearbox Assembly, Installation, Maintenance”)

CAUTION	Remove the male coupling (p/n 249-3) to install the mid-span bearing (108-64) rather than removing the pinion (p/n 15-8).
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Result:

2.7 Tail Rotor Gearbox Installation (p/n 278-200): At installation, perform the following checks:

- 1) Make sure that the tail drive system is completely assembled, installed and torqued down onto the ship except as follows. The 2 bolts that attach the (upper) tail rotor gearbox cover (p/n 252-2) to the tail pylon are present at installation but removed for this check. The output tail rotor drive shaft (p/n 15-100) along with all that attaches to it (hub, blades, etc...) must not be present during the check and may be excluded at installation. Place the ship in an attitude such that it is level in roll and the long shaft housing (p/n 14-13) is between 5.6° and 0° below horizontal. Without a force being applied, the 2 holes in the cover (p/n 252-2) must stay within 1/4 of a hole diameter from the matching holes in the bulkhead, and the tail rotor drive system must not spring forward to the extent that it is stopped by the fuselage. If the installation fails this check, do not loosen then tighten the screws in the flange retainer (p/n 15-17) at the intermediate gearbox in order to correct it.
- 2) When inserting the (upper) tail rotor gearbox assembly (p/n 278-200) into the intermediate (lower) tail rotor gearbox, measure the axial clearance for the shaft. Clearance must be .000 to .063 inches. Shim as required with AN960-416 and/or AN960-416L washers placed in between the gearbox cover (p/n 252-2) and the bulkhead at the top of the tail cone pylon.
- 3) Add washers in the same location as above to compensate for any lateral (side to side) angular misalignment between the cover and the bulkhead. The maximum total amount of shimming thickness allowed from steps 2) and 3) at either of the 2 bolts is .063 inches.
- 4) Once the assembly is fully installed and all fasteners are torqued within the required values, measure the angle between the tail rotor shaft housings (p/n 249-3 and p/n 14-13). Angle must be 95.0° ± 0.4°. (See fig SB-105-2)

If the installation fails these checks then the problem must be found and corrected before further flight. Contact the factory if you need assistance. (Ref. SI-10 “Upper Tail Rotor Gearbox Assembly, Installation, Maintenance”)

Result:

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SHIP S/N	Reg No.	Ship Hours TTIS	Date
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2.8 Tail Rotor Control: Once all assembly and installation is completed, check the tail rotor control rigging per the maintenance instructions. Correct the rigging as necessary.

Result:

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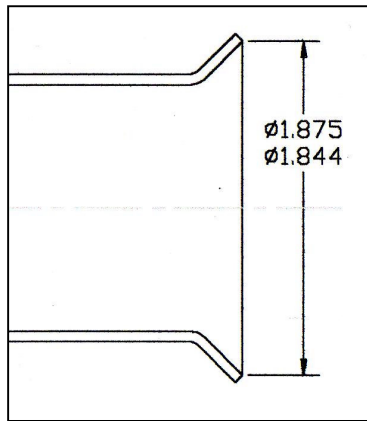


Fig. SB-105-1

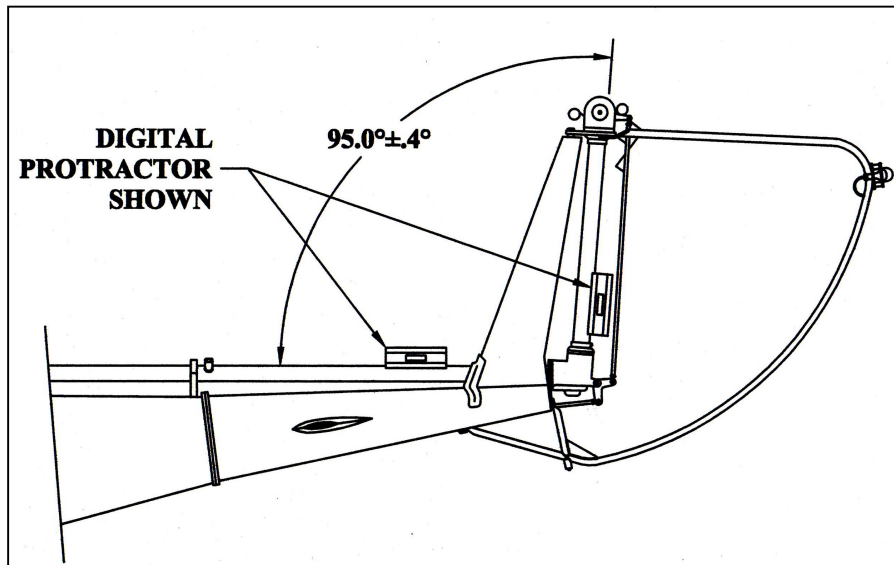


Fig. SB-105-2