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205A-1 MODEL AFFECTED: SUBJECT : TAIL ROTOR YOKE ASSEMBLIES P/N 212-010-704-ALL AND P/N 212-010-744-ALL INSPECTION OF; AND TRUNNION ASSEMBLIES P/N 212-010-738-001 INSPECTION OF, AND TRUNNION ASSEMBLIES P/N 205-012-716-001 212-010-703-001 REMOVAL AND P/N FROM SERVICE. All 205A Helicopters S/N 30001 thru 30228 HELICOPTERS AFFECTED : all spare yoke assemblies P/N and 212-010-704-ALL and 212-010-744-ALL with time since new (TSN) greater than zero (0). Part I Immediately upon receipt of this COMPLIANCE : Bulletin.

RECEIVED Part II Within the next 100 flight hours not removed from service as a result of Part I.

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Part III Immediately, concurrent with Part I, and every 25 flight hours thereafter and each incident involving hard landing, sudden stoppage power-on or off, or other incidents involving excessive tail rotor flapping loads.

Part IV Immediately upon receipt of this bulletin.

AN APPROPRIATE ENTRY SHOULD BE WARE IN THE ALPORAFT LOG SUCK UPON ACCOMPLIAMMENT IF OWNERSHIP OF ALPORAFT HAS CHANGED PLEASE FUR MADD TO NEW OWNER A.S.B. 205-96-68 Page 2 of 21

DESCRIPTION:

Bell Helicopter has determined that when not turning, the tail rotor yoke flexure is susceptible to static overload if it is loaded by external bending forces. Examples of bending loads include high wind gusts (such as those from prop blast), improper ground handling (where the tail rotor blade has been used as a hand hold), improper feathering bearing removal (where the yoke assembly is not properly supported when pressing out bearings), or a static ground strike of some type (such as it being struck by a vehicle). An overload may also occur dynamically during a power-on or off sudden stoppage incident or hard landing. If undamaged, however, the tail rotor yoke flexure is reliable for its full retirement life.

Part I of this Bulletin requires an immediate review of all installed and spare tail rotor yoke assembly historical records to determine if they have previously been involved in any static or dynamic incidents which could have induced a bending load into the Yokes which have an incident history as described above yoke. must be replaced or inspected immediately. A one time ferry flight is authorized for return to a maintenance facility. Additionally, an inspection of the trunnion assembly is required to determine part number installed. If trunnion assembly P/N 205-012-716-001 or 212-010-703-001 is installed, it must be removed from service compliance with Part II. If upon trunnion assembly P/N 212-010-738-001 is installed, an inspection of the flapping stop for yielding is required as described in Part III.

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Part II requires a dimensional inspection of yoke assemblies P/N 212-010-704-ALL and 212-010-744-ALL, to determine if they have been subjected to excessive bending loads.

Part III establishes a 25 hour recurring inspection of the trunnion assembly P/N 212-010-738-001 flapping stop, to determine if damaging/excessive bending loads have been sustained by the tail rotor yoke.

Part IV provides additional helicopter mooring, maintenance, overhaul, and repair information.

APPROVAL:

The engineering aspects of this Alert Service Bulletin are FAA approved.

MANPOWER:

Approximately 6.5 man-hours are required to accomplish Part II of this bulletin. Man-hours are based on hands-on time and may vary with personnel and facilities available.

WARRANTY:

Bell Helicopter has provided special tools to the maintenance facilities listed in Appendix A, which may be used to determine if the operator's yoke has yielded. Operators must remove and disassemble the tail rotor, then forward the yoke and yoke's historical record (hard copy) to one of these facilities. The inspection will be accomplished at no charge and reasonable freight charges will be paid by Bell provided the operator complies with this bulletin no later than 31 December 1996.

** NOTE **

Do not send the tail rotor hub assembly, or the tail rotor hub and blades assembly. Send only the yoke, and be sure that the trunnion is removed. Failure to follow these instructions will result in a charge from the maintenance facility, and the operator will be billed for all additional services required.

MATERIAL:

Consumable Material:

The following material is required to accomplish the bulletin, however this material is considered consumable (bench stock) material and may not require ordering depending on the operators consumable material stock levels. This material may be obtained through your Bell Helicopter Textron Supply Center. A.S.B. 205-96-68 Page 4 of 21

PART NUMBER	NOMENCLATURE	REFERENCE NO.	
36440	Paint Gull Grey (Gal)	C-203	
MIL-P-85582,TY1,CL2	Epoxy Primer (Gal)	C-204	
T5469 PT	Paint Stripper	C-436	

- NOTE -

The "C" REFERENCE NO. above is a cross reference found in the Standard Practice Manual.

SPECIAL TOOLS:

NOMENCLATURE	PART NUMBER	<u>oty</u>
Fixture Set	212-210-001-101	l Ea

- NOTE -

Bell Helicopter has prepositioned the required fixture set at several Customer Service Facilities. Refer to Appendix "A" for your nearest Customer Service Facility. In the event using a Customer Service Facility is not practical contact Product Support Engineering (phone 514-437-6201) to arrange rental agreement for the fixture set.

ELECTRICAL LOAD DATA:

Not affected. -

REFERENCES:

BHT-ALL-SPM BHT-205A-1-MM Chapter 65 BHT-205A-1-CR&O Chapter 65 BHT-205A-1-IPB Chapter 66

PUBLICATION AFFECTED:

BHT-205A-1-MM	Chapter	5	and	65
BHT-205A-1-CR&O	Chapter	65	5	
BHT-205A-1-IPB	Chapter	66	5	

ACCOMPLISHMENT INSTRUCTIONS:

- NOTE -

In all instances below (Part I and Part II) refer to Chapter 64 of the 205 series Maintenance Manual or Component Repair and Overhaul manual (as appropriate) for removal, disassembly, assembly and installation procedures for the components noted.

Part I: <u>Historical Record Review</u>

- 1. Review helicopter records to determine tail rotor assembly maintenance history.
 - a. If it is determined that the tail rotor assembly has experienced an incident that could have imposed a bending load but did not require replacement of the

yoke assembly (i.e. replacement of a damaged blade due to strike etc.), complete the accomplishment section of Part II immediately. A one-time flight is authorized if required to return the helicopter to a maintenance facility.

- b. If the tail rotor assembly is determined to have no damage history as defined in the paragraph above, perform Part II of the Accomplishment Instructions of this bulletin within the specified compliance period.
- 2. Inspect trunnion assembly to determine part number.

- NOTE -

When installed, trunnion assembly P/N 205-012-716-001 or 212-010-703-001 may be identified by the presence of a flanged bushing (split lines) at each bolt hole, readily visible externally when viewing inboard of the trunnion halves adjacent to each bearing. Trunnion assembly P/N 212-010-738-001 is manufactured from a casting and does not incorporate bushings at the bolt locations. No bushing will be visible when viewing the assembled trunnion.

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- P/N Trunnion assembly a. 205-012-716-001 and 212-010-703-001 is manufactured from machined material and does not have the proper characteristics to act as a yield indicator for the yoke assembly. Therefore, if trunnion assembly P/N 205-012-716-001 or 212-010-703-001 is installed, it must be replaced with assembly trunnion P/N 212-010-738-001 upon accomplishment of Part II of this bulletin.
- b. If trunnion assembly P/N 212-010-738-001 is installed, inspect flapping stop in accordance with Part III of this bulletin.
- 3. Make entry in the helicopter historical records indicating compliance with this portion of this Alert Service Bulletin.

Part II: Dimensional Inspection

- NOTE -

If a tail rotor hub and blade assembly removed for this inspection is scheduled to be reinstalled on the helicopter where originally removed, accomplish the following to preclude the need to accomplish static balancing of the assembly: Record position of all installed hardware and blade positions relative to the yoke assembly. After inspection and acceptance of the assembly, install all hardware and components in their original positions as recorded. Upon installation on the helicopter verify dynamic balance. If the yoke or any component of the yoke assembly, hardware, or blades are changed, accomplish static and dynamic balance of the tail rotor assembly in accordance with referenced publications.

- Remove tail rotor hub and blade assembly from the helicopter in accordance with referenced publications and route to maintenance facility.
- 2. Remove tail rotor blades and trunnion assembly in accordance with referenced publications.

- NOTE -

Trunnion assemblies may have ink stamped or vibro etched part numbers. However, if unable to read part number, trunnion assembly P/N 212-010-738-001 is manufactured from a casting, identifiable as having bolt holes drilled in the casting in lieu of bushings installed at the bolt hole locations. Trunnion assembly P/N 205-012-716-001 and 212-010-703-001 are machined parts identifiable by the presence of press fit bushings at the bolt hole locations.

- a. If trunnion assembly P/N 205-012-716-001 or 212-010-703-001 was installed, discard and replace with trunnion assembly P/N 212-010-738-001 upon assembly.
- b. If trunnion assembly P/N 212-010-738-001 is installed, inspect flapping stop in accordance with Part III of this bulletin.
- 4. Using paint remover (C-436) and procedures in BHT-ALL-SPM, Chapter 4, page 6, remove paint and primer from each end of the yoke assembly lower surface from an area extending from the outboard edge of each outboard feathering bearing to the edge of the part, exposing cadmium plating. (See Figure 1 and 2, Note 1). Do not allow paint remover to contact bearings. Also, **remove**, **paint and primer from entire of both sides of the yoke**, around yoke trunnion bearings extending to flexures and edge of part. Do not remove cadmium plating at any location.
- 5. In preparation for taking dimensional measurements, prepare dial indicators (P/N 25-2041J) for installation in fixture set by holding indicator in hand, depressing plunger until dial indicator needles for the 1.00 inch and 0.100 inch inner scales are at zero (0). Rotate outer bezel scale to zero (0), aligned with needle and secure.

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- 6. Position fixture set P/N 212-210-001-101 on a suitable work bench (Figures 1 and 2) using two work aids approximately 7 inches in height. Insert dial indicators from below base plate with end of outer housing positioned between set screw and upper surface of the base plate. Ensure that plunger may be depressed flush with base plate prior to reaching end of travel, and lock indicator in place with set screw.
- 7. Depress indicator plunger and hold flush with base plate using a suitable flat surface (such as -109 bushing). Repeating the procedure for each indicator, read and record indication from dial.
- 8. Position two bushings (-111) in counterbores at the center of base plate (-103). Place yoke assembly in fixture with trunnion bearing areas resting on bushings, with yoke leading edge contacting stop pin (-107). Install bolts from below plate passing through lower bushings and yoke trunnion bearings. Place two bushings (-109) over bolts against yoke. Install washers and nuts. Torque nuts 50 to 60 inch pounds. Ensure yoke assembly remains in contact with stop pin (-107).

- NOTE -

Prior to taking readings, verify freedom of operation by slightly depressing the plunger of each indicator away from yoke and allow to return. l

9. Read and record indication from each dial. "Using the readings recorded in step 6, subtract the smaller reading from the larger reading for the respective positions, and record value. Remove yoke assembly from fixture and position 180 degrees (left to right) from previous installation, repeating steps 8 and 9.

- NOTE -

Readings taken when yoke is rotated 180 degrees in the fixture need not agree with previous readings. Acceptance or rejection of yoke is determined by meeting dimensions as stated in paragraphs a. and b. below only.

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- a. If determined value is not less than 0.675 inch and not greater than 0.755 inch in all four readings recorded at each end of the yoke assembly for each position, it is considered acceptable and may be retained in service. Remove yoke assembly from fixture and restore finish prior to assembly in accordance with referenced publications.
- b. If determined value is less than 0.675 inch or greater than 0.755 inch in any of the readings recorded on each end of the yoke assembly for each position, the yoke assembly is NOT SERVICEABLE. Remove from fixture. Unserviceable yokes must be destroyed to preclude further use.
- 10. Refer to BHT-ALL-SPM, Chapter 4, page 8 for application of primer and page 14 for application of paint.
- 11. Complete tail rotor assembly build-up by installing blades and trunnion set P/N 212-010-738-001, in accordance with referenced publications.
- 12. Install tail rotor assembly on the helicopter and accomplish dynamic balance verification in accordance with referenced publications.
- 13. Make entry in the helicopter historical records indicating compliance with this portion of this Alert Service Bulletin.

Part III: Recurring Inspection

1. Gain access to the tail rotor assembly using a maintenance stand or other means to allow close viewing of the trunnion assembly. Perform visual inspection of flapping stops for deformation to determine if the tail rotor yoke assembly may have been exposed to excessive bending loads, Figure 3. Gently place the tail rotor yoke against one flapping stop, allowing full view of the opposite stop. Repeat in opposite direction to allow viewing of remaining stop. A.S.B. 205-96-68 Page 10 of 21

- a. If no deformation/bending is detected upon inspection of each flapping stop, return helicopter to service.
- b. If either flapping stop is determined to be deformed/bent as depicted in Figure 3, the yoke assembly and trunnion assembly is no longer serviceable and must be removed from helicopter and discarded.
- 2. Make entry in the helicopter historical records indicating compliance with this portion of this Alert Service Bulletin.

PART IV: Additional Information

PARKING HELICOPTER:

- NOTE -

BHT recommends that the tail rotor blades be secured when exposed to wind gusts in excess of 45 knots.

WARNING

Do not exceed load and/or deflection limits during tiedown procedures for tail rotor. Maximum load allowable at blade tip is 50 lbs.

SUDDEN STOPPAGE AND HARD LANDING SPECIAL INSPECTION:

 Perform visual inspection of flapping stop in accordance with Part III of this bulletin after every occurrence of a power-on or power-off sudden stoppage, or a hard landing. INTERMELIATE MAINTENANCE :

WARNING

Current procedures for checking for a bent yoke by measuring precone angle as outlined in current 205 Component Repair and Overhaul Manuals are no longer valid, and should not be utilized for determining serviceability of yoke.

WARNING

When removing or installing bearings from yoke assembly, support yoke in manner to avoid applying excessive bending loads.

- 1. Support yoke assembly adjacent to bearing bore from which bearing is being removed. Ensure support has adequate clearance for bearing. (An example of a suitable support would be a piece of pipe, or similar device, approximately 3 inches in length with an approximate wall thickness of .25 inch minimum and a minimum I.D. of 1.50 inches for the trunnion bearings or 2.00 inches for the feather bearings.)
- 2. Press out bearing.

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A PAINT AND PRIMER REMOVAL REQUIRED 3 YOKE MUST CONTACT STOP PIN WHILE MEASUREMENTS ARE TAKEN

FIGURE 1

212-PSE-1

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SIDE VIEW, 212-210-001-101 FIXTURE SET



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PAINT AND PRIMER REQUIRED

REF PART AT PARAGRAPH 9

3 YOU MUST CONTACT STOP PIN WHILE MEASUREMENTS ARE TAKEN

FIGURE 2

212-PSE-2



FIGURE 3

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