

URGENT

TB 1-1520-240-20-150

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

INSPECTION OF SWASHPLATE BEARING, FORWARD AND AFT ON ALL H-47 SERIES AIRCRAFT

Headquarters, Department of the Army, Washington, D. C.
18 October 2002

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NOTE

THIS PUBLICATION IS EFFECTIVE UNTIL RESCINDED OR SUPERSEDED.

NOTE

In accordance with AR 95-1, paragraph 6-6A/6-14A, MACOM Commanders may authorize temporary exception from message requirements. Exception may only occur when combat operations or matter of life or death in civil disasters or other emergencies are so urgent that they override the consequences of continued aircraft operation.

1. **Priority Classification. Urgent**
2. **Summary**

a. **Background** — During ground run, a CH-47D Chinook aircraft experienced an aft rotating ring drive arm lug failure that resulted in a Rotor Blade strike to the fuselage, upper tunnel cover and other significant aircraft damage. Investigation has revealed that this incident was the end result of an Aft Swashplate Bearing failure.

b. **Message Purpose** —

- (1) Require an immediate and recurring (every 100 flight hours) visual inspection of all H-47 Forward and Aft Swashplate Bearings.
- (2) Require an immediate grease purge of all H-47D/F Forward and Aft Swashplate Bearings.
- (3) Require an immediate and recurring (every 50 flight hours) grease sample of all H-47D/F Forward and Aft Swashplate Bearings.
- (4) Increase the frequency of lubrication for the H-47D/F Forward and Aft Swashplate Bearings from every 100 flight hours to every 50 flight hours.

This TB supersedes USAAMCOM Message, 042115Z Oct 02 SOF CH-47-03-01

TB 1-1520-240-20-150

(5) Clarify the daily visual inspection of the Forward and Aft Swashplates to emphasize inspection of the lower seal area.

3. **End Items to be Inspected.** All H-47 series aircraft.

4. **Assemblies/Components/Parts Affected.**

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
Swashplate Assy, Forward	145R3551-19	1615-01-473-4376
Swashplate Assy, Forward	145R3551-17	1615-01-395-0006
Swashplate Assy, Forward	145R3551-1	1615-01-115-3623
Swashplate Assy, Forward	145R3551-11	1615-01-352-8575
Swashplate Assy, Forward	145R3551-5	1615-01-315-5133
Swashplate Assy Aft	145R3551-20	1615-01-475-9838
Swashplate Assy Aft	145R3551-18	1615-01-395-0007
Swashplate Assy Aft	145R3551-2	1615-01-115-3610
Swashplate Assy Aft	145R3551-12	1615-01-352-8576
Swashplate Assy Aft	145R3551-6	1615-01-317-2432
Bearing, Swashplate	114RS308-1	3110-00-141-3750
Bearing, Swashplate	114RS308-2	3110-01-356-0489

NOTE

When complying with the requirements of this message, complete forms and records entries in accordance with DA PAM 738-751. ULLS-A users will use applicable "E" forms.

5. **Initial TAMMS (The Army Maintenance Management System) Compliance Requirements.**

a. Aircraft in Use. Upon receipt of this Technical Bulletin (TB) make the following entry on the DA Form 2408-13-1. Enter a red horizontal dash **//** status symbol with the following statement: "Comply with requirements of SOF CH-47-03-01 (TB 1-1520-240-20-150) prior to next flight, but no later than 19 October 2002." Commanders who are unable to comply with the requirements of this Technical Bulletin within the time frame specified will upgrade the affected aircraft status symbol to a red **//X//**.

NOTE

The TAMMS Compliance Reporting Form is available at "www.redstone.army.mil/sof/tamms.xls" (use lower case letters only) or may be obtained from the units servicing LAR. Alternate forms may be approved by the AMCOM SOF Compliance Officer

NOTE

MH-47E aircraft that have completed a swashplate bearing inspection within the previous 100 flight hours are exempt from the initial swashplate bearing visual inspection but must comply with the new 100 hour inspection interval which begins 100 flight hours from the last swashplate inspection.

NOTE

Any H-47 aircraft that have swashplate assemblies with less than 100 flight hours Time Since New or Time Since Overhaul (TSN/TSO) are exempt from the initial swashplate bearing visual inspection but must comply with the new 100 hour inspection interval which begins 100 flight hours from TSN/TSO.

NOTE

The TAMMS Compliance Report only confirms the unit has made the initial logbook entry for assigned aircraft. TAMMS Compliance Report will include aircraft serial numbers (in numerical order), date of entry on DA Form 2408-13-1, unit address, local Point Of Contact name and phone number.

- b. TAMMS Compliance Report – Submit TAMMS Compliance Report via email to “safeadm@redstone.army.mil” no later than 15 October 2002.

6. Task/Inspection Compliance Requirements.

NOTE

The Task/Inspection Reporting Form is available at “www.redstone.army.mil/sof/log.xls” (use lower case letters only) or may be obtained from the units servicing LAR. This report will cite the message number, date of inspection, aircraft serial number, aircraft hours, component serial number, component hours, and results of inspection.

- a. Aircraft – Submit Task/Inspection Compliance Report for this message to Logistical point of contact no later than 19 October 2002.
- b. Retail Stock (Installation level and below) – Submit Task/Inspection Compliance Report for this message to Logistical point of contact no later than 19 October 2002.
- c. Wholesale Stock (Including Depot stock, Depot Maintenance and Single Stock Fund) – N/A.

7. Special Provisions to Message Requirements (Aircraft)

- a. Aircraft in AVUM, AVIM or Depot level maintenance - Commander, facility manager and contractors will not issue aircraft until they are in compliance with this message.
- b. Aircraft at Contractor Facility - Boeing Helicopters will inspect DD 250 aircraft prior to those aircraft departing for ferry to final destination if not relieved by paragraph 5a notes.
- c. Aircraft in Transit -
 - (1) Surface/air shipment - Comply with message requirements prior to first flight after arrival.
 - (2) Ferry status/Aircraft away from home station - Aircraft in Ferry status/Aircraft away from home station are authorized a one-time flight (with intermediate stops) to the nearest secure maintenance facility to facilitate message compliance.
- d. Maintenance Trainers (Category A and B). Comply with message requirements no later than 30 April 2003.

8. Technical Procedures/Instructions..

NOTE

Supplemental information for this message can be viewed at (use lower case letters only) “www.redstone.army.mil/sof/suppl/c47s0301.pdf”.

NOTE

Do not lubricate the swashplate prior to performing the visual inspection of the swashplate bearings

- a. Visual initial and 100 hour recurring inspection of all H-47 Forward and Aft Swashplate Bearings.

NOTE

This inspection can be performed on or off aircraft.

CAUTION

It is imperative that the Rotor Head be locked out prior to performing the bearing inspection or damage to components will occur.

TB 1-1520-240-20-150

(1) Lock out the Rotor Heads: H-47D/F per TM 55-1520-240-23; Task 11-28, Install Servocylinder Safety Blocks and Task 5-97, Remove Pitch Link (Pitch Link Lockpins installed). MH-47E per TM 1-1520-252-23; Task 11-33, Install Servocylinder Safety Blocks and Task 5-145, Remove Pitch Link (Pitch Link Lockpins Installed).

NOTE

Prior to removing hardware, thoroughly wipe clean all upper seal surfaces (only), by hand with a lint free cloth. Remove only the Upper Seal, P/N 114R3428-1. Do not remove the Upper Bearing Retainer, P/N 114R3126-4. Only 12 bolts and washers (Aft) or nuts and washers (Fwd) need to be removed.

(2) Remove Forward and Aft Swashplate Upper Seal, P/N 114R3428-1, per TM 55-1520-240-23, Task 5-122, paragraphs 1a and 2a (H-47D/F) or TM 1-1520-252-23, Task 5-175, paragraphs 1a and 2a (MH-47E).

WARNING

If this inspection is performed on aircraft, ensure no FOD enters the bearing. Do not attempt to clean or wipe the bearing prior to performing the next step.

(3) Use a flashlight or other suitable light source to visually inspect for raised, overlapping or broken cage segments. Inspect for orange/red pieces of debris. The lower grease seal is elastomeric orange/red in color: therefore this type of rubber debris may be indicative of damage to this lower seal.

WARNING

Do not use cloths or rags to clean the bearing area, as this may snag or catch on the bearing cage and disturb the balls.

(4) Wipe away excess grease in cavity using fingers. Use a flashlight or other suitable light source to visually inspect for raised, overlapping or broken cage segments or multiple adjacent uncaged ball bearing. Inspect for orange/red pieces of rubber debris.

NOTE

The design of the bearing allows for up to 3 individual cage segments with each segment separated by one uncaged ball.

(5) If any of these conditions are found, except for those in the note above, the Swashplate Assembly shall be considered unserviceable and disposition is in accordance with paragraph 11d of this message. This inspection will now be required every 100 flight hours for all H-47 aircraft.

NOTE

If replacement self-locking nuts are not available, re-use of the original nuts is authorized provided they meet the following torque requirement. The torque required to start the nut rotating with a minimum of one full thread extending from the end of the nut shall be at least 7 inch-pounds. The standard procedure of using new nuts at each removal and reinstallation shall be followed as soon as new nuts are available.

(6) If the bearing passes the inspections of 3 and 4, install the Swashplate Upper Seal, P/N 114R3428-1, per TM 55-1520-240-23, Task 5-125, Paragraphs 7b and 8e-h (H-47D/F) or TM 1-1520-252-23, Task 5-179, Paragraphs 7b and 8e-h (MH-47E). If nuts were reused on forward swashplate, apply a torque stripe to all nuts for visual inspection reference. A Daily Inspection will be required until new nuts are installed.

(7) Unlock Rotor Heads; H-47D/F per TM 55-1520-240-23; Task 5-99, Install Pitch Links (remove Pitch Link Lockpins) and Task 11-29, Remove Servocylinder Safety Blocks. MH-47E per TM 1-1520-252-23; Task 5-148, Install Pitch Links (remove Pitch Link Lockpins) and Task 11-34, Remove Servocylinder Safety Blocks.

CAUTION

For the purpose of this message only, a test flight to track the rotor blades is not required as long as no adjustments were made to the Pitch Links and the Pitch Links are installed back in their original location.

b. Initial and recurring 50 hour lubrication/purge and initial and 50 hour recurring grease sample of all H-47D/F Forward and Aft Swashplate Bearings.

(1) Using a soft, clean, lint-free cloth, dampened with cleaning solvent (MIL-PRF-680), clean the inner ring assembly and outer ring assembly at the upper seal. Wipe dirt and grease from lubrication fitting. Ensure all surface grit, sand, and other foreign material is removed, ensuring an uncontaminated grease sample.

NOTE

Mobil 28 grease is recommended if available.

CAUTION

Pumping grease into swashplate without turning rotating ring can result in bearing damage.

NOTE

If you cannot pump grease and rotate the swashplate at the same time, rotate swashplate in 12 equal steps, 30 degrees each step. Pump in grease between steps.

(2) Army Oil Analysis Program (AOAP) grease sample procedure.

(a) Have helper rotate ring by pulling blades around with tie down line. As ring rotates, pump grease into fitting. Rotate the ring through at least one full turn (360 degrees) to ensure thorough purging of the bearing. Use a hand lubricating grease gun with a flexible hose. Pump until clean grease appears all the way around the line between the stationary upper seal and rotating upper seal. Ensure all the old grease is purged from the assembly and is immediately collected. Use a tongue depressor to fill a three ounce plastic sampling bottle at least half full and reserve the remaining purged grease for use in subparagraph 3.

(b) Once the AOAP sample is taken, the bottle label should be filled out as completely as possible to avoid confusion with other grease samples.

(c) Submit the AOAP grease sample to the AOAP laboratory with a complete DD Form 2026.

(d) Maintain the DA Form 2408-20 on each swashplate in accordance with DA PAM 738-751.

(3) Use the additional grease sample and feel for metal chips in grease. If there are chips, the swashplate shall be considered unserviceable and disposition in accordance with paragraph 11d of this message.

(4) The Swashplate Bearing will now be required to be lubricated and a grease sample taken every 50 flight hours.

c. Using a flashlight or other suitable light source, visually inspect with a mirror or flexible borescope the area between the underside of the rotating ring and stationary ring for any slinging or clumping or grease/debris (i.e. seal, bearing cage, seal spring, wire, or other material). A thin even bead of grease around the sealing area is considered normal. This inspection will now be required on the Preventive Maintenance Daily (PMD).

TB 1-1520-240-20-150

d. Annotate the DA Form 2408-18 with the following inspections:

(1) 100 flight hour recurring inspection of the forward and aft swashplate bearing. ULLS-A units will use inspection number A182 (Insp FWD & AFT Swashplate bearing IAW CH-47-03-01).

(2) 50 flight hour lubrication/purge and grease sample of the forward and aft swashplate bearings. ULLS-A units will use inspection number A121 (Sample & lube FWD & AFT swashplate bearings IAW CH-47-03-01).

e. Clear the initial entry from paragraph 5a and note compliance on DA Form 2408-5-1 (Swashplate Assembly).

9. Procedures/Instructions for Assemblies/Components/Parts In Work or In Stock (at all levels including war reserves)

a. Items in Retail Stock - Commanders and facility managers that maintain retail stock at installation level and below will complete the following procedures.

(1) Contact the supported aviation unit, as required, to perform the procedures required on affected items.

(2) Submit a Task/Inspection report in accordance with paragraph 6b.

b. Items in Single Stock Fund and in Work (Overhaul/Repair Facility) - N/A.

c. Items in Wholesale Stock - N/A.

10. Special Tools and Fixtures Required. As required.

11. Supply/Parts (Requisition/Disposition)

NOTE

HQDA-ADCS-G-3 will prioritize units and repair parts distribution.

a. Parts Required. The following parts/components may be required to return aircraft to a serviceable condition.

NOMENCLATURE	PART NUMBER/ NATIONAL STOCK NUMBER	QUANTITY	COST EACH	TOTAL \$
Swashplate, Aft	145R3551-20 1615-01-475-9838	1	\$133,245.00	\$133,245.00
Swashplate, Fwd	145R3551-19 1615-01-473-4376	1	\$133,245.00	\$133,245.00
Bearing	114R3104-4 3120-01-342-0061	2	\$3599.40	\$7198.80
Seal	114RS306-6 5330-00-999-4077	2	\$533.60	\$1067.20
Retainer	114R3417-3 5330-01-474-4303	4	\$317.98	\$1271.92
Ring Assembly	114R3490-1 1615-01-476-0755	1	\$4354.32	\$4354.32
Bolt	BACB30LC6-38 5306-01-474-3835	36	\$2.77	\$99.72
Bolt	BACB30FD5H14 5306-01-476-1906	36	\$3.07	\$110.52
Nut, Self-Locking	FN22M524 5310-01-070-9314	12	\$6.11	\$73.32

NOMENCLATURE	PART NUMBER/ NATIONAL STOCK NUMBER	QUANTITY	COST EACH	TOTAL \$
Bolt, Shear	MS21134H05004 5306-01-108-7462	12	\$4.19	\$50.28
Gasket	114R3428-1 5330-00-849-4366	2	\$74.16	\$148.32
Nut, Self-Locking	FN22M-428 5310-01-184-0356	10	\$3.92	\$39.20
Nut, Self-Locking	FN22M-624 5310-01-184-0354	36	\$1.62	\$58.32
Retainer, Swashplate	114R3126-4 1615-00-181-4127	2	\$3108.49	\$6216.98
Total cost per aircraft = \$266,563.32				

b. Bulk and Consumable Materials.

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
Grease, WTR	MIL-G-81322	9150-00-145-0268
Bottle, Plastic	MIL-B-44054	8125-01-082-9697
Tongue depressor (wooden)	GGD226	6515-00-324-5500
Cloth, Lint Free	MIL-C-24671	4470-01-498-8080

c. Requisitioning Instructions. Requisition replacement parts using normal supply procedures. All requisitions shall use project code (CC 57-59) "X22" (X-RAY-TWO-TWO).

NOTE

Project code "X22" is required to track and establish a database of stock fund expenditures incurred by the field as a result of message actions.

d. Disposition of discrepant parts/components. Submit a Category I Deficiency Report on any Swashplate Assembly that failed the inspections detailed in paragraphs 8 of this message.

e. Disposition of Hazardous Material. In accordance with Environmental Protection Agency directives as implemented by your servicing environmental coordinator (AR 200-1).

12. Maintenance Application.

a. Category of Maintenance – AVUM. Aircraft downtime will be charged to AVUM.

b. Estimated Time Required.

(1) Time to complete inspection – Total of 12 man-hours using 4 persons with 3 hours downtime per one end item.

(2) Time for repair/replacement – Total of 125 man-hours using 8 persons with 16 hours downtime per one end item.

c. TB/MWOs to be Applied Prior to or Concurrently with this Inspection. N/A.

TB 1-1520-240-20-150

13. Publication Requirements

a. References

- (1) AR 95-1.
- (2) DA PAM 738-751.
- (3) TM 55-1520-240-23, Aviation Unit and Aviation Intermediate Maintenance Manual, CH-47D Helicopter.
- (4) TM 1-1520-252-23, Aviation Unit and Aviation Intermediate Maintenance Manual, MH-47E Helicopter.
- (5) TM 55-1520-240-PMD, Preventive Maintenance Daily, CH-47D Helicopter.
- (6) TM 1-1520-252-PMD, Preventive Maintenance Daily, MH-47E Helicopter.

b. Publications Which Require Change as a Result of This Inspection. The following publications shall be changed to reflect this Technical Bulletin. A copy of this Technical Bulletin will be used as authority to implement the change until the official change is received.

(1) TM 55-1520-240-23 and TM 1-1520-252-23 will be changed to reflect this Technical Bulletin as follows–

(a) Change the frequency of lubrication/purge for the Forward and Aft Swashplate Bearings from 100 hours to every 50 hours.

(b) Add a requirement to inspect the Forward and Aft Swashplate Bearing by removing the upper seal. Frequency shall be every 100 flight hours.

(c) Add a requirement to take a grease sample of the Forward and Aft Swashplate Bearings. Frequency shall be every 50 flight hours.

(2) TM 55-1520-240-PMD and TM 1-1520-252-PMD will be modified to clarify the location to check for accumulated grease and damaged or displaced seals.

(3) TB 43-0106 Appendix A for the CH-47. Add a requirement to take a grease sample of the Forward and Aft Swashplate Bearings. Frequency shall be every 50 flight hours.

14. Points of Contact.

a. Technical points of contacts are;

(1) Primary – Mr. Steve Prosize, AMSAM-RD-AE-I-P-C. DSN 897-2350 extension 9851 or (256) 705-9851, fax is (256)705-9900. E-mail is “steve.prosize@rdec.redstone.army.mil”.

(2) Alternate – Mr. Larry Wieschhaus, AMSAM-RD-AE-I-P-C, DSN 897-2350, extension 9866 or (256) 705-9866, fax is (256) 705-9900. Email is “larry.wieschhaus@rdec.redstone.army.mil”.

b. Logistical point of contacts are;

(1) Primary – Mr. Bill Olson, SFAE-AV-CH-L, DSN 897-3379 or commercial (256) 313-3379, fax is DSN 897-4348 or commercial (256) 313-4348. E-mail is “william.olson@peoavn.redstone.army.mil”.

(2) Alternate – CW5 Jack Martin, SFAE-AV-CH-L, DSN 897-3617 or (256) 313-3617, fax is DSN 897-4348 or (256) 313-4348. Email is “john.martin@peoavn.redstone.army.mil”.

c. Wholesale Materiel point of contact (SPARES) is Ms. Geri Reddy, AMSAM-MMC-AV-CA, DSN 897-1454 or (256) 313-1454, fax is DSN 897-1106. E-mail is “geri.reddy@redstone.army.mil”.

d. Forms and records point of contact for this TB is Ms. Ann Waldeck, AMSAM-MMC-MA-NM, DSN 746-5564 or commercial (256) 876-5564, fax is DSN 746-4904 or (256) 876-4904. E-mail is “ann.waldeck@redstone.army.mil”.

e. Safety points of contact are ;

(1) Primary – Mr. Frank Rosebery (SAIC), AMSAM-SF-A, DSN 788-8631 or commercial (256) 842-8631, datafax is DSN 897-2111 or commercial (256) 313-2111. E-mail is "frank.rosebery@redstone.army.mil".

(2) Alternate – Mr. Russell Peusch, AMSAM-SF-A, DSN 788-8632 or commercial (256) 842-8632, fax is DSN 897-2111 or commercial (256) 313-2111. E-mail is "russell.peusch@redstone.army.mil".

f. Foreign Military Sales (FMS) recipients requiring clarification of action advised by this TB should contact Mr. Ronnie W. Sammons, AMSAM-SA-AS-UT, DSN 897-0407 or commercial (256) 313-0407, Data-fax is DSN 897-0411 or commercial (256) 313-0411. E-mail is "ronnie.sammons@redstone.army.mil".

g. After hours contact AMCOM Command Operations Center (AOC) DSN 897-2066/7 or commercial (256) 313-2066/7.

15. Reporting of Errors and Recommending Improvements. You can help improve this manual. If you find mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5230. A reply will be furnished to you. You may also provide DA Form 2028 information to AMCOM via e-mail, fax or the world wide web. Our fax number is: DSN 788-6546 or Commercial 256-842-6546. Our e-mail address is 2028@redstone.army.mil. Instructions for sending an electronic 2028 may be found at the back of this manual. For the World Wide Web use: <https://amcom2028.redstone.army.mil>.

TB 1-1520-240-20-150

By Order of the Secretary of the Army:

Official:



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From: "Whomever" <whomever@avma27.army.mil>

To: <2028-@redstone.army.mil>

Subject: DA Form 2028

1. **From:** Joe Smith
2. **Unit:** home
3. **Address:** 4300 Park
4. **City:** Hometown
5. **St:** MO
6. **Zip:** 77777
7. **Date Sent:** 19-OCT-93
8. **Pub no:** 55-2840-229-23
9. **Pub Title:** TM
10. **Publication Date:** 04-JUL-85
11. **Change Number:** 7
12. **Submitter Rank:** MSG
13. **Submitter FName:** Joe
14. **Submitter MName:** T
15. **Submitter LName:** Smith
16. **Submitter Phone:** 123-123-1234
17. **Problem:** 1
18. **Page:** 2
19. **Paragraph:** 3
20. **Line:** 4
21. **NSN:** 5
22. **Reference:** 6
23. **Figure:** 7
24. **Table:** 8
25. **Item:** 9
26. **Total:** 123
27. **Text:**

This is the text for the problem below line 27.

