

URGENT

***TB 1-1520-240-20-157**

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

**MANDATORY VISUAL INSPECTION FOR CRACKS ON ALL
ROTOR BLADE ROOT AND FIBER DISTORTION ON ALL
CH-47D, CD-47F, MH-47D AND MH-47E AIRCRAFT**

Headquarters, Department of the Army, Washington D.C.
5 August 2005

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

NOTE

This message is effective until rescinded or superseded.

NOTE

This message is issued IAW AR 95-1 and has not been transmitted to units subordinate to addressees. Addressees will immediately retransmit this message to all subordinate units, activities or elements affected or concerned. MACOMS will immediately verify this transmission to the AMCOM SOF Compliance Officer (AMSAM-SF-A, safeadm@redstone.army.mil).

NOTE

MACOM commanders may authorize temporary exception from message requirements IAW AR 95-1, Chapter 6. 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.

NOTE

Commanders unable to comply with the requirements of this message within the time frame specified will change the affected aircraft status symbol to a Red //X//.

1. Summary

1.1. Background - During Boeing investigations of a Royal Air Force cracked H-47 rotor blade, and a US Army H-47 rotor blade Quality Deficiency Report (QDR), Boeing found the rotor blade manufacturing process generated distortion in some of the composite material fibers wraps around the rotor blade root end bore. Instead of the root end bore fibers curing in the resin with one smooth and continuous direction, cured fibers sustained wrinkled shaped distortions. Rotor blade fiber distortion wrinkles preclude the rotor blade from being able to achieve blade fatigue life.

* This TB1-1520-240-20-157 supersedes, MSG DTG 211915Z July 2005 CH-47-05-SOF-02.

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1.2. Message Purpose

1.2.1. Require initial visual inspection for cracks on all H-47 rotor blade root ends and augment the current Preventive Maintenance Daily (PMD) blade inspection.

1.2.2. Restrict repairs of the blades from the root end up to, but not including, the first lag damper bracket winding.

2. End Items Affected - All H-47 series aircraft.

3. Assemblies/Components/Parts Affected - Suspect/discrepant assemblies/components/parts:

NOMENCLATURE	PN	NSN
FWD ROTARY WING BLADE	114R1702-37	1615-01-145-7109
AFT ROTARY WING BLADE	114R1702-38	1615-01-145-7110

NOTE

When complying with the requirements of this message, complete forms and records entries IAW DA PAM 738-751. ULLS-A units will use appropriate "E" forms.

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

4.1. Upon receipt of this message, 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 CH-47-05-SOF-02 NLT 4 Aug 05".

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 Of cer.

NOTE

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

4.2. TAMMS Compliance Report - Submit TAMMS Compliance Report via priority email to "safeadm@redstone.army.mil" NLT 28 Jul 05 IAW AR 95-1. If email is not available, the report may be faxed to: SOF Compliance Of cer at DSN 897-2111 or (256) 313-2111.

5. Task/Inspection Compliance Reporting 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 the inspection.

5.1. Aircraft - Submit task/inspection compliance report for this message to Log POC NLT 6 Aug 05.

5.2. Retail Stock (Installation level and below) - N/A.

5.3. Wholesale Stock (Including Depot Stock, Depot Maintenance and Single Stock Fund) - N/A.

6. Special Provisions To Message Requirements (Aircraft)

6.1. Aircraft in AVIM or Depot level maintenance - Commanders, facility managers and contractors will not issue aircraft until they are in compliance with this message.

6.2. Aircraft at Contractor Facility - DD 250 aircraft will be in compliance with this message prior to departure.

6.3. Aircraft in Transit - Unit commanders in receipt of deployment orders and who are unable to comply prior to the date specified in para 4.1, may defer initial requirements IAW surface/air shipment or ferry status instructions, as appropriate.

6.3.1. Surface/Air Shipment - Comply with message requirements during NLT 14 days after arrival.

6.3.2. Ferry Status/Aircraft away from home station - Comply with message requirements NLT 14 days after arrival at final destination.

7. Technical Procedures/Instructions

NOTE

Addendum to CH-47-05-SOF-02 can be viewed at (use lower case letters only) "<https://ams14.redstone.army.mil/safety/sof/pic/c47s0502.pdf>" or "<https://extranet.chinook.peoavn.army.mil/>". Both sites require logon and password. Adobe version 6 or higher is required to view the addendum. For a free download of the current version go to "www.adobe.com".

NOTE

The rotor blade root end areas that do not require inspection for the purposes of this message are noted in figure 3 and 4 of addendum and include: the root end slot seal assembly (P/N 114R1779-1); the filled vertical slots just above and below the root end slot seal assembly; areas of the root end composite pads in the center of the blade, outboard of the vertical hinge pin liner; lightning electrical leads (P/N 225915BL0000) and associated connections/jumper leads/mounting brackets/adhesives/ sealants; the lag damper bracket; and lag damper installation windings.

7.1. Initial inspection - Visually inspect for cracks on all H-47 rotor blade root ends.

7.1.1. For rotor blades installed on the aircraft, prepare aircraft for safe ground maintenance and insure tie downs are attached to facilitate rotor blades positioning during inspection. For both installed and uninstalled rotor blades, proceed to para 7.1.2, after reading the warnings below.

WARNING

Degreasing solvent (E471) (MIL-PRF-680 TYPE III) is flammable and toxic. Refer to Material Safety Data Sheets (MSDS) for the items being used. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

WARNING

Acetone (E20) is extremely flammable. It can be toxic. Refer to Material Safety Data Sheets (MSDS) for the items being used. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, spark, or open flame. In case of contact, immediately flush skin or eyes with water for at least 15 minutes. Get medical attention for eyes.

7.1.2. Clean all visible areas of the rotor blade root end up to, but not including, the first lag damper winding with a clean cloth moistened with dry cleaning solvent (E471). Wear gloves (E186) and goggles (E473).

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7.1.3. With a flashlight, mirror, putty knife, scotchbrite/120 grit abrasive paper, and a coin tap, visually inspect the root end of the blade surfaces surrounding the vertical hinge pin bore of the blade, depicted in figure 5-6 of addendum, for cracks. Cracks will have originated in the underlying fiberglass structure and propagated through the outer most layer of black paint. To differentiate between normal chipped layers of paint edges and actual cracks emanating through the paint, it will be necessary to remove any loose paint by the methods described in para 7.1.3.1 and 7.1.3.2 to confirm cracks in suspect areas:



Be careful not to damage blade surface while removing paint.

NOTE

Illustrations of properly removed paint from suspect areas are depicted in figures 7 through 11 of addendum.

7.1.3.1. With a putty knife, carefully lift and remove loose paint from the rotor blade surface. Care must be taken to avoid gouging the blade.

7.1.3.2. Sand the suspected cracked areas of the rotor blade root ends using scotchbrite (E2) or 120 grit abrasive paper (E7), or finer, to remove raised/cracked paint layers. If necessary, soften the paint finish with acetone (E20). Do not go into the fiberglass surface of the root end or composite pad. If another layer of firmly adhered paint exists below the cracked paint layer, clean the area with a cloth (E120) dampened with dry cleaning solvent (E471) to remove sanding debris prior to further inspection. Wear gloves (E186) and goggles (E473). A 10x magnifying glass may be utilized to aid the visual inspection.

7.2. Use the following criteria during the visual inspection for crack determination. Inspect for:

7.2.1. Fiberglass cracks/buckles/distortions in the composite root end pad.

7.2.2. Fiberglass cracks in the composite root end.

7.2.3. Fiberglass de-bonds in the root end.

7.2.4. Broken or frayed fiberglass fibers in the root end.

7.2.5. Dull thud from coin tapping the fiberglass root end or composite pad.

7.2.6. Evidence of structural breakdown of the fiberglass composite material. Illustrations of these anomalies are provided in figures 7 through 12 of addendum.

7.3. Examine the Vertical Hinge Pin (VHP) area for evidence of liner de-bonding, or blade root vertical misalignment.

7.3.1. For installed blades - Visually inspect for rotor blade, root end, hinge pin liner for complete un-bonding by observing if the blade root end is centered in the Pitch Varying Housing (PVH) lugs (for example: the lower root end pad is not contacting the lower seal or PVH lug).

7.3.2. Inspecting uninstalled rotor blade hinge pin liners - After inspecting uninstalled rotor blades for cracks IAW para 7.2. - visually inspect the hinge pin liner for being centered in the rotor blade hinge pin bore. If the hinge pin liner is not centered in the root end bore, then the blade is unserviceable.

7.4. If completely un-bonded or off-centered rotor blade hinge pin liners are discovered, then the rotor blade is unserviceable. Disposition unserviceable rotor blade IAW para 10.4.

7.4.1. If no un-bonded rotor blade hinge pin liners are discovered, proceed to para 7.4.4.

7.4.2. If cracks or liner de-bonding are found mark them with a white mark and change the aircraft status be to a Red //X// with the following statement: "(serial number) rotor blade unserviceable IAW CH-47-05-SOF-02." Disposition rotor blade IAW para 10.4. Clear the Red //X// when the rotor blade is replaced with a serviceable blade.

7.4.3. If cracks or liner de-bonding are suspected but not confirmed contact the technical POC in paragraph 13; with the following information: rotor blade serial number, part number, and photographs of the suspected area.

7.4.4. If no cracks are suspected and paint still covers all root end surfaces then proceed to para 7.5.

7.4.5. If no cracks are suspected and exposed fiberglass surfaces exist where paint was removed then re finish the rotor blade per TM 55-1520-240-23, task 5-82 / TM 1-1520-252-23, task 5-122.

7.5. Clarification of technical manual regarding blade repairs:

7.5.1. The possibility exists for maintenance personnel to fill a crack that was mistaken for superficial forms of repairable damage. To preclude the masking/blending of cracks during blade repairs conducted IAW TM 55-1520-240-23, task 5-67.1 / TM 1-1520-252-23, task 5-90, special attention must be given to determine that any damage does not extend beyond the current root end, repair limits. Therefore, all US Army maintainers must ensure any suspect root end surface damage does not extend beyond the authorized limits of TM 55-1520-240-23, task 5-67.1 / TM 1-1520-252-23, task 5-90, for distance B (0.108 inch deep). If there is any question with regard to the depth of damage, maintenance personnel are to contact their local liaison engineers, logistical area representatives, Boeing field service representative, or the technical POC in para 13 prior to further repair actions.

7.5.2. To preclude the masking of cracks during blade repairs conducted IAW TM 55-1520-240-23, task 5-67.1.1 / TM 1-1520-252-23, task 5-91, a restriction must be imposed. Therefore, all US Army maintenance facilities, are restricted from repairing rotor blades utilizing TM 55-1520-240-23, task 5-67.1.1 / TM 1-1520-252-23, task 5-91 for root end surfaces up to, but not including the first lag damper winding.

7.6. Conduct a recurring inspection at each PMD IAW para 12 of this SOF. Use a flashlight, wiping cloth, solvents and a mirror as required.

7.7. Clear the initial entry from para 4.1, and note compliance on DA Form 2408-5-1 (main rotor blade).

8. Procedures/Instructions For Assemblies/Components/Parts In Work Or In Stock (At All Levels Including War Reserves) - N/A.

9. Special Tools And Fixtures Required - N/A.

10. Supply/Parts (Requisition/Disposition)

10.1. Parts required:

NOMENCLATURE	PN/NSN	QTY	COST EA.	TOTAL \$
FWD BLADE, ROTARY WING	114R1702-37	3	\$216393.00	\$649179.00
	1615-01-145-7109			
AFT BLADE, ROTARY WING	114R1702-38	3	\$216393.00	\$649179.00
	1615-01-145-7110			

Total cost per aircraft = \$ 1298358.00

(If all rotor blades require replacement)

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10.2. Bulk and consumable materials:

NOMENCLATURE	PN	NSN
CLOTH, CLEANING (E120)	CCC-C-458	8305-00-753-2967
SCOTCH BRITE, TYPE A (E2)	N/A	7910-00-753-5242
DRY CLEANING SOLVENT, TYPE III (E471)	MIL-PRF-680	6850-00-285-8011
ACETONE (E20)	O-A-51	6810-00-184-4796
GLOVES, ANTI-CONTACT (E186)	MIL-G-10902	N/A
ABRASIVE PAPER, 120 GRIT (E7)	P-P-101	5350-00-721-8115
GOGGLES (E473)	ANSI Z87.1	4220-00-052-3776

10.3. Requisitioning instructions - Requisition replacement parts using normal supply procedures. All requisitions shall use Project Code (CC 57-59) "X3D" (X-ray-Three-Delta).

NOTE

Project Code "X3D" is required to track and establish a data base of stock fund expenditures incurred by the field as a result of message actions.

10.4. Disposition of discrepant parts/components - Unit or maintenance facility will notify the logistical point of contact in para 13.2 of the serial number for any rotor blade root end that has a suspected crack or completely de-bonded root end, hinge pin liner. The rotor blade shall be green tagged and turned in through normal US Army supply channels with a disposition for overhaul. All turn-in documents must include Project Code (CC 57-59) "X3D" (X-ray-Three-Delta).

10.5. Disposition of hazardous material - IAW Environmental Protection Agency directives as implemented by your servicing environmental coordinator (AR 200-1).

11. Maintenance Application

11.1. Category of maintenance - AVUM

11.2. Estimated time required:

11.2.1. Time to complete initial inspection - Total of 2 man-hours.

11.2.2. Additional time to complete PMD - Total of 0.5 man-hours during the Preventive Maintenance Daily Inspection (PMD).

NOTE

The time stated below does not include time for Maintenance Operational Checks or Maintenance Test Flights, if required.

11.2.2. Time for blade replacement - Total of 10 man-hours using 5 persons with 2 hours "Not Mission Capable Maintenance" (NMCM) time per blade.

12. Publication Requirements

12.1. References:

12.1.1. AR 95-1.

12.1.2. AR 200-1.

12.1.3. DA PAM 738-751.

12.1.4. TM 55-1520-240-23.

12.1.5. TM 1-1520-252-23.

12.1.6. TM 1-1520-252-PMD.

12.1.7. TM 55-1520-240-PMD.

12.2. Publication changes - TM 55-1520-240-23, TM 55-1520-240-PMD, TM 1-1520-252-23, and TM 1-1520-252-PMD, shall be changed to reflect this message. A copy of this message will be used as authority to implement the change until the official change is received. The publications listed below shall be changed as noted.

12.2.1. TM 55-1520-240-23, task 5-67.1.1: A warning shall be placed before para 1 to state the following:

WARNING

No blade shank voids are allowed in the rotor blade root end from the end of the blade up to, but not including, the first lag damper bracket winding. Any voids found in this area of the root end using coin tapping (task 5-63.1) shall require the void to be marked with a marking pencil (E271) and the blade to be sent to overhaul for repair.

12.2.2. TM 55-1520-240-23, task 5-67.1.1: The figure shall be changed by deleting the reference for allowable damage depth of 0.316 inches on the blade root end. The reference for allowable damage depth of 0.316 inches in the first section of the root end shall be replaced with a note that states "no drill repairs allowed".

12.2.3. TM 1-1520-252-23, task 5-91: A warning shall be placed before para 1 to state the following:

WARNING

No blade shank voids are allowed in the rotor blade root end from the end of the blade up to, but not including, the first lag damper bracket winding. Any voids found in this area of the root end using coin tapping (task 5-78) shall require the void to be marked with a marking pencil (E320) and the blade to be sent to overhaul for repair.

12.2.4. TM 1-1520-252-23, task 5-91: The figure shall be changed by deleting the reference for allowable damage depth of 0.316 inches on the blade root end. The reference for allowable damage depth of 0.316 inches in the first section of the root end shall be replaced with a note that states "No Drill Repairs Allowed".

12.3 TM 55-1520-240-PMD

12.3.1. Area 10.8, aft rotor and pylon (right side): The "specific location" shall be modified to add the words, "check blade root end up to, but not including, first lag damper bracket winding for cracks. Ensure bottom surface of blade root end is not contacting pitch varying housing lug".

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12.3.2 Area 12.6, aft rotor and pylon (left side): The "specific location" shall be modified to add the words, "check blade root end up to, but not including, first lag damper bracket winding for cracks. Ensure bottom surface of blade root end is not contacting pitch varying housing lug".

12.3.3. Area 14.18, forward rotor and pylon (left side): The "specific location" shall be modified to add the words, "check blade root end up to, but not including, first lag damper bracket winding for cracks. Ensure bottom surface of blade root end is not contacting pitch varying housing lug".

12.3.4. Area 15.14, forward rotor and pylon (right side): The "specific location" shall be modified to add the words, "check blade root end up to, but not including, first lag damper bracket winding for cracks. Ensure bottom surface of blade root end is not contacting pitch varying housing lug".

12.4. TM 1-1520-252-PMD

12.4.1. Sequence number 10.6, aft rotor and pylon area (right side): The "item and procedure" shall be modified to add the words, "check blade root end up to, but not including, first lag damper bracket winding for cracks. Ensure bottom surface of blade root end is not contacting pitch varying housing lug".

12.4.2. Sequence number 12.6, aft rotor and pylon area (left side): The "item and procedure" shall be modified to add the words, "check blade root end up to, but not including, first lag damper bracket winding for cracks. Ensure bottom surface of blade root end is not contacting pitch varying housing lug".

12.4.3. Sequence number 14.18, forward rotor and pylon area (left side): The "item and procedure" shall be modified to add the words, "check blade root end up to, but not including, first lag damper bracket winding for cracks. Ensure bottom surface of blade root end is not contacting pitch varying housing lug".

12.4.4. Sequence number 15.16, forward rotor and pylon area (right side): The "item and procedure" shall be modified to add the words, "check blade root end up to, but not including, first lag damper bracket winding for cracks. Ensure bottom surface of blade root end is not contacting pitch varying housing lug".

13. Points Of Contact

13.1.1. Primary - Mr. Tim Rickmeyer, AMSAM-RD-AE-C, DSN 645-6485 or (256) 955-6485. Fax is 256-313-4726. Email is "Timothy.Rickmeyer@us.army.mil".

13.1.2. Alternate - Mr. Neil Sutherland, AMSAM-RD-AE-C, DSN 897- 3382 or (256) 313-3382. Fax Is 897-4726 or (256) 313-4726. Email Is "Neil.Sutherland@Uus.army.mil".

13.2. Logistical POCs are:

13.2.1. Primary - Mr. Bill Olson, SFAE-AV-CH, DSN 897-0721 or (256) 313-0721. Fax Is 897-4726 or (256) 313-4726. Email Is "William.Olson@peoavn.redstone.army.mil".

13.2.2. Alternate - Mr. Mark Samuelson, SFAE-AV-CH, DSN 897-0726 or (256) 313-0726. Fax Is 897-4726 or (256) 313-4726. Email Is "Mark.Samuelson1@us.army.mil".

13.3. Forms and records POCs are:

13.3.1. Primary - Ms. Ann Waldeck, AMSAM-MMC-MA-NM, DSN 746-5564 or (256) 876-5564. Fax Is DSN 746-4904 or (256) 876-4904. Email Is "Ann.Waldeck@redstone.army.mil".

13.3.2. Alternate - Ms. Sibyl Johnson, AMSAM-MMC-MA-NM, DSN 788- 6696 or (256) 842-6696. Fax Is DSN 746-4904 or (256) 876-4904. Email Is "Sibyl.Johnson@redstone.army.mil".

NOTE

A listing of published safety messages can be viewed at "<https://ams14.redstone.army.mil/safety/sof/index.html>". This is a secured website which requires an Army Knowledge Online (AKO) ("www.us.army.mil") ID and password.

13.4. Safety POCs are:

13.4.1. Primary - Mr. Frank Rosebery (SAIC), AMSAM-SF-A, DSN 788-8631 or (256) 842-8631. Fax Is DSN 897-2111 or (256) 313- 2111. Email Is "Frank.Rosebery@redstone.army.mil".

13.4.2. Alternate - Mr. Russell Peusch, AMSAM-SF-A, DSN 788-8632 or (256) 842-8632. Fax Is DSN 897-2111 or (256) 313-2111. Email Is "Russell.Peusch@redstone.army.mil".

13.5. Foreign Military Sales POC Is Mr. Ronnie W. Sammons, AMSAM-SA-AS-UT, DSN 897-0875 or (256) 313-0875. Fax Is DSN 897- 0411 or (256) 313-0411. Email Is "Ronnie.Sammons@redstone.army.mil".


13.6. After hours, contact the AMCOM Operations Center (AOC) DSN 897-2066/7 or (256) 313-2066/7.

14. Reporting of Errors and Recommending Improvements.

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or 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 35898-5000. You may also submit your recommended changes by E-Mail directly to 2028@redstone.army.mil or by fax (256) 842-6546/DSN 788-6546. A reply will be furnished directly to you. Instruction for sending an electronic 2028 may be found at the back of this publication.

By Order of the Secretary of the Army:

Official:


SANDRA R. RILEY
*Administrative Assistant to the
Secretary of the Army*
0521403

PETER J. SCHOOMAKER
*General, United States Army
Chief of Staff*

DISTRIBUTION:

To be distributed in accordance with the Initial Distribution Number (IDN) 314153 requirements for TB 1-1520-240-20-157.

These are the instructions for sending an electronic 2028

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@wherever.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.

PIN: 082626-000