DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

ULTRASONIC INSPECTION OF 540-011 SERIES MAIN ROTOR BLADES UH-1C, UH-1M, AH-1G, TH-1G AND AH-1S

Headquarters, Department of the Army, Washington, D. C.

25 March 1981

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail Your letter of DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, US Army Troop Support and Aviation Materiel Readiness Command, ATTN: DRSTS-MTT, 4300 Goodfellow Blvd, St. Louis MO, 63120. A reply will be furnished to you.

1. PURPOSE OF INSPECTION. The purpose of this bulletin is to provide the instructions necessary for ultrasonic inspection of 540-011 main rotor blade assemblies as required by the special inspection section of the applicable aircraft maintenance manuals.

2. PRIORITY CLASSIFICATION. This inspection is in the NORMAL category.

a. Equipment in Use. As required by applicable aircraft maintenance manuals.

b. Prepositioned Stock. Not applicable.

3. END ITEM OR SYSTEM TO BE INSPECTED.

MODEL	SERIAL NUMBER
UH-1C/M	63-8684 64-14101 thru 64-14191 65-9416 thru 65-9564 65-12738 thru 65-12744 65-12772 66-0491 thru 66-0745 66-15000 thru 66-15245
AH-1G/S and TH-1G	66-15249 thru 66-15357 67-15450 thru 67-15869 68-15000 thru 68-15213 68-17020 thru 68-17113 69-16410 thru 69-16447 70-15936 thru 70-16105 71-20983 thru 71-21052 76-22567 thru 76-22610 76-22692 thru 76-22713 77-22729 thru 77-22810 78-23043 thru 78-23125

4. MODULES (Components, assemblies, subassemblies, boards and cards.) TO BE MODIFIED. The following items, whether installed or in stock, will be inspected. Not applicable.

5. PARTS TO BE INSPECTED. The following items whether installed or in depot stock shall be inspected. Items in stock shall be inspected before issuing and so marked that it can be easily determined if inspection has been accomplished. Vibro etch on the border of the data plate the number of the ultrasonic inspection. An arabic 1 for the first inspection, etc.

NATIONAL STOCK NUMBER	PART NUMBER	NOMENCLATURE
1615-00-817-7461	540-011-001-5	Blade Assembly
1615-00-178-9680	540-011-250-1	Blade Assembly

6. APPLICATION.

a. Time Compliance Schedule. Not applicable.

b. Level of Maintenance. Depot maintenance with assistance from Organizational Maintenance as required.

c. Applied By. Certified Untrasonic Inspector. Qualification and Certification of DARCOM NDTI Personnel, DARCOM-R 702-22.

d. Time for Completion of TB Application to One End Item.

(*1*) Total of 3 hours using one person.

(*2*) Total of 3.5 hours downtime for one helicopter.

e. Time for Completion of One Assembly or Component. Not applicable.

f. Time for Completion of One Part.

NOMENCLATURE	NSN	PART NO.	MANHOURS
Blade Assembly	1615-00-817-7461	540-011-001-5	1.5
Blade Assembly	1615-00-178-9680	540-011-250-1	1.5

g. TB to be Applied Prior to or Concurrently with this TB. Not applicable.

h. Additional Information. Blades PN 540-011-001-5 shall not be mixed with Blades PN 540-011-250-1 on the same helicopter. Blades PN 540-011-250-1 and PN 540-015-001-1 are interchangeable and can be mixed on the same helicopter.

7. TECHNICAL PUBLICATIONS AFFECTED/CHANGED AS A RESULT OF THIS TB. Not applicable**.**

8. SUPPLY KITS, PARTS AND DISPOSITION.

a. Kits/Parts Required to Accomplish TB. Not applicable.

b. NSN, Weight, Dimensions and Cube of Kit(s). Not applicable.

c. Distribution and Issue Instructions. Not applicable.

9. BULK AND CONSUMABLE MATERIALS.

NSN	Item Name and Part No.	Quantity Required Per End Item/System Module	Part	Figure and Item No. (Where Applicable)
6850-00-264-9038	Couplant (Glycerine, Petroleum Jelly) P-D-680 Solvent		A/R	

10. PARTS DISPOSITION. Any blade determined to have a void in the spar closure bond line shall be removed from service, mutilated and scrapped locally.

Special Remarks. Not applicable.

11. SPECIAL TOOLS, JIGS, TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE), AND FIXTURES REQUIRED.

Nomenclature	NSN	Part or Reference Number	Quantity
Branson Flaw/Thickness Tester		Sonoray Mark II Model 301A	
Transducer Guide Templates		NARF PN CLA PN 81213-2 and 81213-3	
1/2 inch active element 5 Megahertz Transducer Crystal material quartz		Branson PNZ-101 CF or Equivalent	1
Transducer holder and guide		NARF PN CLA PN81300A	
Calibration Standard		NARF PN CLA PN B38032	
Six (6) foot connecting cables			

12. INSPECTION PROCEDURES.

a. Make helicopter safe for ground maintenance.

NOTE

Determination of whether blades must be removed from helicopter prior to inspection is at the discretion of the inspector.

Prior to conducting inspection, check blade data plate to ensure blade is either PN 540-011-001-5 or PN 540-011-250-1. Blade assemblies PN 540-015-001-1 shall not be inspected using these procedures.

b. Clean top and bottom surfaces of blades with cheesecloth dampened with P-D-680 cleaning solvent or equivalent.

NOTE

Blade must be inspected between Blade Station 78 and 240 as follows:

c. Through Transmission Method.

(1) Connect battery charger unit to a 110/115 Volt, 50/60 cycle AC power supply. If unit is to be operated in battery mode, disconnect unit from AC power supply. The batteries are automatically recharged while unit is operating on AC.

(2) Connect 5 MHZ, 3/8 inch active element Transducer to Transmit "T" Connector.

(3) Connect 5 MHZ, 1/2 inch active element Transducer to receiving "R" Connector.

(4) Turn power ON/OFF switch to ON position. Allow a few minutes for Cathode Ray Tube (CRT) to warm up and a trace to appear on the screen.

(5) Turn Rep. Rate Switch to 1,000 CPS position.

(6) Turn Filter IN/OUT switch to IN position.

(7) Turn 1/2 switch to 2 position.

(8) Turn DAMPING KNOB to 1 position.

(9) Turn DB IN/OUT switches to OUT position.

(10) Turn Range switch to 2 inch position.

(11) Turn Delay switch to 1 position.

(12) Turn Delay Knob until initial bang appears on far left of CRT screen.

(13) Turn Gain Knob to maximum (fully clockwise).

CAUTION

DO NOT EXCEED THE NUMBER 4 POSITION.

(14) Turn reject control to 1 position (fully counterclockwise). Then introduce only enough reject to clear base line of noise, interference (grass).

(15) Place Transducers on Calibration Standard and manipulate Transducers over the Spar to closure area until a signal is received, then move over the core. Once signal is received, turn Mat'l Cal. knob until the second core response is positioned on right of CRT screen **(NOTE: The signal amplitude (height) of signal should be full screen. If not, return to Step (1) and repeat procedure.)**

(16) Scan Calibration Standard and locate the void area. **(Note loss of signal occurs when Transducers are over void area. The loss of signal denotes either a lack of bond or a poor bond.)**

(17) The instrument is now ready to inspect a 540 Series Rotor Blade.

(18) Place Transducers into Transducer Holder and guide.

(19) Place Template over leading edge of Main Rotor Blade to be inspected. Verify location of station 80 at 42-1/2 inches from blade butt end. Ascertain that it is positioned properly.

(20) Apply couplant liberally.

(21) Place Transducers and guide on Blade and against Template. Manipulate Transducers until a signal is obtained.

(22) Scan the Blade, commencing at station 78 outboard to station 240. Any complete loss of signal represents a void in the Bond line. Scan rate should not exceed 1/2 inch per second. If loss of signal occurs and is not related to loss of couplant, blade shall be removed from service and disposed of in accordance with paragraph 10.

(23) Clean couplant from blade.

13. CALIBRATION REQUIREMENTS. Not applicable.

14. WEIGHT AND BALANCE DATA. Weight and balance are not significantly affected.

15. QUALITY ASSURANCE REQUIREMENTS. Inspection of completed TB application for full compliance with the technical requirements of the instructions will be accomplished by qualified personnel in accordance with an approved prescribed inspection system. The inspection system in effect will be determined on the basis of instruction issued at the site of work, i.e., Army Unit Intermediate, Army depot, contractors.

16. RECORDING. Record accomplishment of the inspection in accordance with the procedures in TM 38-750. The following forms are applicable.

a. DA Form 2407, Maintenance Request

b. DA Form 2408-5, Equipment Modification Record. (For M/R Blade.)

c. DA Form 2408-13, Aircraft Inspection and Maintenance Record (Aircraft).

d. DA Form 2408-18, Equipment Inspection List (Aircraft).

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, TB requirements for AH-1G, UH-1C/M, AH-1S (MOD), and AH-1S (PROD) aircraft.

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