

URGENT

*TB 1-1520-210-30-02

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

IMMEDIATE AND RECURRING INSPECTION OF 42-DEGREE GEARBOX ASSEMBLY INPUT AND OUTPUT QUILL BEVEL GEARSHAFT, ALL UH-1 SERIES AIRCRAFT

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

21 June 2000

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

1. **Priority Classification.** URGENT

NOTE

Paragraphs 8.c.(1) and 8.c.(3) of this TB have been changed since release of SOF message UH-1-00-08.

NOTE

IAW AR 95-1, paragraph 6-6a, MACOM commanders may authorize temporary exception from SOF 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.

a. Aircraft in Use. Upon receipt of subject message/Technical Bulletin (TB), make the following entry on DA Form 2408-13-1. Enter a **Red Horizontal Dash (-)** status symbol with the following statement: "Inspect 42-Degree Gearbox assembly IAW TB 1-1520-210-30-02 (SOF UH-1-00-08) prior to next flight". The inspection will be completed prior to the next flight, but NLT 20 JUN 00. The **Red Horizontal Dash (-)** entry may be cleared when the inspection of paragraph 8. is completed. The affected aircraft shall be inspected prior to next flight, but NLT 20 JUN 00. Commanders who are unable to comply with the requirements of this TB within the time frame specified will upgrade the affected aircraft status symbol to a **Red (X)**.

b. Aircraft in Depot Maintenance. Depot commanders will not issue aircraft until they are in compliance with subject message/TB.

c. Aircraft Undergoing Maintenance. Commanders and facility managers will not issue aircraft until they are in compliance with subject message/TB.

*This TB supersedes USAAMCOM Safety of Flight (SOF) Message UH-1-00-08, 082316Z, JUN 00.

d. Aircraft in Transit.

(1) **Surface/Air Shipment.** Prior to first flight.

(2) **Ferry Status.**

(a) Within 5 flight hours.

(b) Those aircraft that have a DD 250 and are at US Helicopters will be inspected prior to ferry to final destination.

e. Maintenance Trainers (Category A and B). N/A.

f. Component/Parts in Stock at All Levels (Depot and Others) Including War Reserves.

(1) **Wholesale Stock.** N/A.

(2) **Retail Stock.** Upon receipt of this TB, commanders and facility managers maintaining retail stock at installation level and below shall contact the supporting aviation unit to perform the procedures required IAW paragraphs 8. and 9. on suspect materiel. Dispose of discrepant material IAW paragraph 10. Report compliance with this TB IAW paragraph 14.d.(2).

g. Components/Parts in Work. (Depot Level and Others). Commanders and facility managers will not issue items listed in paragraphs 6. and 7. which are in work until they are in compliance with subject message/TB.

2. Task/Inspection Suspense Date. Complete the inspection IAW paragraph 8. prior to next flight, but NLT 20 June 2000, and report IAW paragraph 14.b.

3. Reporting Compliance Suspense Date. No later than 30 June 2000, IAW paragraph 14.a. of this TB.

4. Summary of the Problem.

a. There have been 9 reported failures of the 42-Degree Gearbox Assembly Gearshafts on Army UH-1 aircraft, and 14 failures on UH-1 aircraft in the commercial arena. Failure of the Gearshaft is caused by bending fatigue of the gear teeth at the root. An inspection is required to detect cracks at the root of the gear teeth.

b. For Manpower/Downtime and Funding Impacts, see paragraph 12.

c. The purpose of this TB is to require an immediate and recurring inspection of the 42-Degree Gearbox Assembly gear teeth for cracks.

5. End Items to be inspected. All UH-1H/V aircraft.

6. Assembly Components to be Inspected. Inspect all UH-1 series aircraft Intermediate Gearboxes, to include:

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
Gearbox Assembly, 42-Degree	204-040-003-ALL	1615-00-918-2676
		1615-00-633-0864
		1615-00-776-1626
		1615-00-472-7306
		1615-00-624-5266
		1615-00-796-4218

7. Parts to be Inspected.

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
Bevel Gearshaft	204-040-500-ALL	3040-00-797-8573
		3040-00-797-8576

8. Inspection Procedures.

- a. Remove Gearbox IAW TM 55-1520-210-23-1.

NOTE

Do not exchange quills between different Gearboxes. Failure of either quill within a Gearbox renders that Gearbox unserviceable. Disassembly of the input and output quills is not required in order to perform the fluorescent penetrant inspection. Keep input and output quills from each Gearbox as a matched set.

- b. Remove input and output quills per disassembly instructions (TM 55-1520-210-23-1, paragraph 6-184.).

- c. Inspect Gearshaft as follows:

(1) Clean gear teeth using Class 2 solvent per TM 1-1500-335-23 to remove oil and grime. Apply solvent with a clean lint-free rag, being careful to avoid contaminating bearings. Wipe with isopropyl alcohol (TT-I-735, NSN 6810-00-983-8551) and a clean lint-free rag to achieve a dry surface for inspection.

NOTE

Gear teeth should be clean and free of residue prior to inspection.

(2) Visually inspect gear teeth for galling, nicks, scoring, or cracks at root radius. Visually inspect the case for active corrosion, especially on the O-ring sealing surface that might cause leaking.

CAUTION

Use brush-on application of penetrant when performing fluorescent penetrant inspection to prevent contamination of bearings.

CAUTION

Use of excess solvent in removing dye prior to applying developer may dilute or remove dye from crack, preventing crack detection.

(3) Mask bearings and perform fluorescent penetrant inspection per TM 1-1500-335-23, Type 1, Method C, and Sensitivity Level 3 or equivalent method on the gear teeth.

9. Correction Procedures.

CAUTION

Do not exchange quills between different Gearboxes. Although TM 55-1520-210-23 currently allows swapping of quills between Gearboxes, a change is being processed to stop this practice. Failure of either quill within a Gearbox renders that Gearbox unserviceable. Reassemble Gearbox with original components and return to depot for overhaul.

- a. Gears found cracked as a result of FPI inspection are considered unserviceable.

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b. Gears that do not show indications of cracks are considered serviceable, and shall be reassembled using the procedure of TM 55-1520-210-23-1, paragraph 6-188.

c. Install serviceable Gearbox IAW TM 55-1520-210-23-1.

d. Perform the following after the initial and each recurring inspection:

(1) Drain and refill Gearbox after 25 flight hours to remove any fluorescent penetrant residuals. Drain and refill should be performed within 1/2 hour of aircraft shutdown.

(2) Annotate DA Form 2408-13-1 to drain and refill the 42-Degree Gearbox in 25 flight hours after each 150-hour recurring inspection.

e. Repeat inspection at 150-hour intervals. This inspection will be added to the special inspections listed in TM 55-1520-210-23. A variance of +/- 10 percent is authorized for follow-on Gearshaft inspections. This inspection will be added to DA Form 2408-18 and the Unit Level Logistics System-Aviation (ULLS-A). Units will use this TB as authority to modify the inspection master file to include inspection number A248 for this inspection.

10. Supply/Parts and Disposition.

a. **Parts Required.** Items cited in paragraph 6. may be required to replace defective items.

b. **Requisitioning Instructions.** Requisition replacement parts using normal supply procedures. All requisitions shall use project code (CC 57-59) "XD6".

NOTE

Project code "XD6" is required to track and establish a data base of stock fund expenditures incurred by the field as a result of SOF actions.

c. **Bulk and Consumable Materials.**

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER	QTY
Nut, Self-Locking	MS21042L4	5310-00-807-1475	12
Washer, Flat	AN960-416L	5310-00-167-0835	12
Washer, Flat	NAS1197-416L	5310-00-804-6801	12
Packing, Preformed	MS29561-237	5330-00-726-4153	2

d. **Disposition.** Return discrepant components IAW normal supply procedures.

e. **Distribution of Hazardous Material.** IAW Environmental Protection Agency directives as implemented by your servicing environmental coordinator (AR 200-1).

11. Special Tools, Jigs and Fixtures Required. N/A.

12. Application.

a. **Category of Maintenance.** AVIM. Aircraft downtime will be charged to AVIM.

b. Estimated Time Required.

- (1) Total of 8 man-hours using 1 person.
- (2) Total of 8 hours downtime for one end item.

c. Estimated Cost Impact of Stock Fund Items to the Field.

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER	QTY	COST EA. \$	TOTAL \$
Nut, Self-Locking	MS21042L4	5310-00-807-1475	12	0.11	1.32
Washer, Flat	AN960-416L	5310-00-167-0835	12	0.02	0.24
Washer, Flat	NAS1197-416L	5310-00-804-6801	12	0.02	0.24
Packing, Preformed	MS29561-237	5330-00-726-4153	2	1.10	2.20
Gearbox Assembly, 42-Degree	-----	-----	1	2380.68	2380.68

Total cost per aircraft if all parts require replacement = \$2384.68

d. TB/MWOs to be Applied prior to or concurrently with this Inspection. N/A.**e. Publications which Require Change as a Result of this Inspection.**

- (1) TM 55-1520-210-23
- (2) TM 1-1520-256-23
- (3) DMWR 55-1560-123

The above TMs shall be changed to reflect this TB. A copy of this TB shall be inserted in the appropriate TM as authority to implement the change until the printed change is received.

13. References.

- a. TM 55-1520-210-23-1
- b. TM 55-1520-210-23P
- c. TM 1-1500-335-23
- d. DA PAM 738-751

14. Recording and Reporting Requirements.

a. Reporting Compliance Suspense Date (Aircraft). Upon entering requirements of this TB on DA Form 2408-13-1 on all subject mission design series (MDS) aircraft, commanders will forward a priority message, datafax or e-mail to CDR, AMCOM, ATTN: AMSAM-SF-A (SOF compliance officer), Redstone Arsenal, AL 35898-5000, IAW AR 95-1. Datafax number is DSN 897-2111 or (256) 313-2111. E-mail address is <safeadm@redstone.army.mil>. The report will cite SOF message and TB number, date of entry in DA Form 2408-13-1, the aircraft MDS and serial numbers of aircraft in numerical order.

b. Task/Inspection Reporting Suspense Date (Aircraft). Upon completion of inspection, commanders will forward a priority message through their MACOM POC listed in paragraph 16.c. to the logistics POC listed in paragraph 16.b., NLT 30 JUN 00. The report will cite SOF message and TB number, date of inspection, aircraft serial number (if applicable), component serial number, component hours, and results of the inspection.

c. **Reporting TB Receipt Date (Spares).** N/A.

d. **Task/Inspection Reporting Suspense Date (Spares).**

(1) **Materiel in Wholesale Depot Storage.** N/A.

(2) **Materiel in Retail Storage.** Report compliance with this TB (through MACOM as per paragraph 14.b.) to the logistical point of contact in paragraph 16.b., NLT 23 Jun 00. Report the quantity inspected by condition code, and the resulting condition code. Report by e-mail or datafax and provide local point of contact.

e. **The following forms are applicable and are to be completed in accordance with DA PAM 738-751, 15 March 1999:**

NOTE

ULLS-A users will use applicable "-E" forms.

(1) DA Form 2408-5-1, Equipment Modification Record (Gearbox Assy, 42-Degree).

(2) DA Form 2408-13, Aircraft Status Information Record.

(3) DA Form 2408-13-1, Aircraft Inspection and Maintenance Record.

(4) DA Form 2408-15, Historical Record for Aircraft.

(5) DA Form 2408-16, Aircraft Component Historical Record.

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

(7) DA Form 2410, Component Removal and Repair/Overhaul Record (only if the 42-degree Gearbox is removed and/or replaced).

(8) DD Form 1574/DD Form 1574-1, Serviceable Tag/Label - Materiel (color yellow). Annotate remarks block with "Inspected Serviceable IAW TB 1-1520-210-30-02 (UH-1-00-08)."

(9) DD Form 1575/DD Form 1575-1, Suspended Tag/Label - Materiel (color brown). Annotate remarks block with "Suspended IAW TB 1-1520-210-30-02 (UH-1-00-08)."

(10) DD Form 1576/DD Form 1576-1, Test/Modification Tag/Label - Materiel (color blue). Annotate authority block with "TB 1-1520-210-30-02 (UH-1-00-08)."

(11) DD Form 1577/DD Form 1577-1, Unserviceable (Condemned) Tag/Label - Materiel (color red). Annotate remarks block with "Condemned IAW TB 1-1520-210-30-02 (UH-1-00-08) and mutilated per TM 1-1500-328-23."

(12) DD Form 1577-2/DD Form 1577-3, Unserviceable (Reparable) Tag/Label - Materiel (color green). Annotate remarks block with "Unserviceable IAW TB 1-1520-210-30-02 (UH-1-00-08)."

15. Weight and Balance. N/A.

16. Points of Contact.

a. Technical point of contact for subject message/TB is Mark Jeude, AMSAM-RD-AE-EPT, DSN 897-4960 or (256) 313-4960. Datafax is (256) 313-4961. E-mail is <mark.jeude@redstone.army.mil>. Alternate is Steve Monaco, AMSAM-RD-AE-I-D-U, DSN 645-0078 or (256) 955-0078; datafax is (256) 955-6590; e-mail is "steve.monaco@UH.redstone.army.mil".

b. Logistical point of contact for subject message/TB is Charlie Elkins, AMSAM-DSA-UH-U, DSN 645-0073 or (256) 955-0073. Datafax is DSN 897-3762. E-mail is <charlie.elkins@uh.redstone.army.mil>.

c. The MACOM points of contact for subject message/TB are as follows:

AMC	John Savelli	DSN 767-9891
FORSCOM	MSG Tucker	DSN 367-6239
NGB	MAJ David Gereski	DSN 327-7773
MDW	CPT Al Robison	DSN 656-7647
ATEC	'Chief Bob Barlett	COM 915-569-6229
TRADOC	Judy Dyer	DSN 680-5683
USAREUR	Dave Spinks	011-49-631-413-8900
USARPAC	Chief Mike McCarthy	COM 808-438-9892

d. Wholesale Materiel point of contact (Spares) for subject message/TB is Mr. Kenneth Gardner, AMSAM-MMC-VS-UN, DSN 897-1545 or commercial (256) 313-1545. Datafax is DSN 897-1541 or (256) 313-1541. E-mail is <gardner-kd@exchange1.redstone.army.mil>.

e. Forms and records point of contact for subject message/TB is Ms. Ann Waldeck, AMSAM-MMC-RE-FF, DSN 746-5564 or commercial (256) 876-5564. Datafax is DSN 746-4904 or (256) 876-4904. E-mail is <waldeck-ab@redstone.army.mil>.

f. Safety point of contact for subject message/TB are:

(1) Mr. Frank Rosebery (SAIC), AMSAM-SF-A, DSN 788-8631 or (256) 842-8631. Datafax is DSN 897-2111 or (256) 313-2111. E-mail is <frank.rosebery@redstone.army.mil>.

(2) Alternate Mr. Signey Hernandez, AMSAM-SF-A, DSN 897-2094 or commercial (256) 313-2094. Datafax is DSN 897-2111 or (256) 313-2111. E-mail is <signey.hernandez@redstone.army.mil>.

g. Foreign Military Sales (FMS) recipients requiring clarification of action advised by subject message/TB should contact either CW5 Joseph L. Wittstrom, Security Assistance Management, AMSAM-SA, DSN 897-0410 or commercial (256) 313-0410; E-mail is <wittstrom-jl@redstone.army.mil> or Mr. Ronnie W. Sammons, AMSAM-SA-CS-NF, DSN 897-0408 or (256) 313-0408; datafax is DSN 897-0411 or (256) 313-0411, E-mail is <sammons-rw@redstone.army.mil> (Huntsville, AL. is GMT minus 6 hrs).

h. After hours contact AMCOM Command Operations Center (COC) DSN 897-2066/2067 or commercial (256) 313-2066/2067.

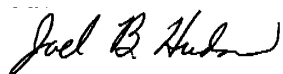
17. Reporting of Errors and Recommending Improvements. You can improve this TB. If you find any mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: Commander, US Army Aviation and Missile Command, ATTN: AMSAM-MMC-LS-LP, Redstone Arsenal, Alabama 35898-5230. A reply will be furnished to you. You may also send in your comments electronically to our E-mail address: <is-lp@redstone.army.mil> or by datafax: DSN 788-6546 or commercial (256) 842-6546. Instructions for sending a 2028 by E-mail may be found at the back of most TMs.

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By Order of the Secretary of the Army:

Official:

ERIC K. SHINSEKI
General, United States Army
Chief of Staff



JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0016607

DISTRIBUTION:

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.

SOMETHING WRONG WITH PUBLICATION

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

PUBLICATION DATE

PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE NO.

PARA-GRAPH

FIGURE NO.

TABLE NO.

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.

TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER

SIGN HERE

THE METRIC SYSTEM AND EQUIVALENTS

NEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
 1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 1000 Grams = 2.2 lb.
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
 1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

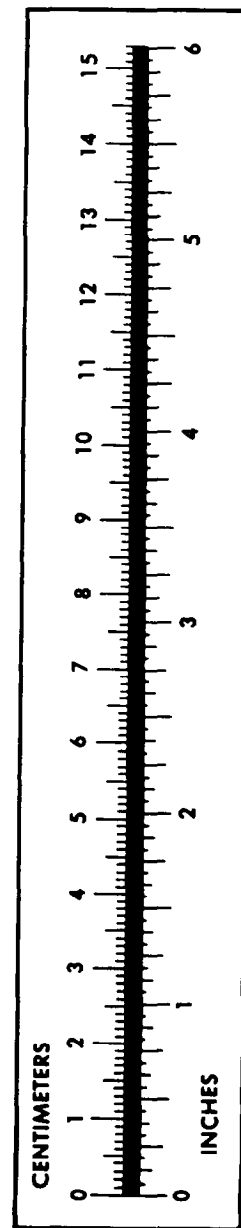
TEMPERATURE

$5/9(^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
its	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
ometers per Liter	Miles per Gallon	2.354
ometers per Hour	Miles per Hour	0.621



PIN: 078181-000