ROUTINE

TB 1-1520-237-30-1

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

HH-60L/UH-60A/L AIRCRAFT DESERT OPERATIONS SPECIAL INSPECTION AND CLEANING REQUIREMENT

Headquarters, Department of the Army, Washington, D. C.
30 July 2003

NOTE

Approved for Depot or Contract Field Team; distribution is unlimited, to be performed by Contractor Field Teams only.

1. Purpose. To provide an expeditious inspecting and cleaning requirement to remove salt/salt laden sand and other corrosive contaminants from aircraft involved in desert operations thereby returning aircraft to pre-deployment condition.

2. Priority Classification. This Technical Bulletin is classified "ROUTINE".

a. Aircraft in Use. Upon receipt of this Technical Bulletin (TB), make the following entry on the DA Form 2408-13-1. Enter a Horizontal Dash // – // status symbol with the following statement: "Inspect IAW TB 1-1520-237-30-1 not later than 2 years after the date of this TB". The Horizontal Dash // – // may be cleared when the inspection of paragraph 9 below and the cleaning required in paragraph 10 are complete. The affected aircraft shall be scheduled at the earliest possible date; not later than 2 years after the date of this TB.

b. Aircraft in Depot maintenance. Same as paragraph 2.a.

c. Aircraft undergoing maintenance. Same as paragraph 2.a.

d. Aircraft in transit.

(1) Surface/air shipment. Same as paragraph 2.a.

(2) Ferry status. Same as paragraph 2.a.

e. Maintenance trainers (Category A and B). NA

f. Component/parts in stock including War Reserves at all levels (Depot and others). Same as paragraph 2.a.

3. End Items to be Inspected. All aircraft after redeployment from SWA.

4. Assembly Components to be Inspected. NA

5. Parts to be Inspected. NA

6. Application.

a. Category of maintenance. AVIM

b. Time required. Average of 3330 man hours using 9 persons.

c. Estimated cost impact of stock fund items to the field. TBD

d. TB/MWO's applied to or concurrently with this inspection. As required.

e. Deferred maintenance to be accomplished concurrently with this inspection. As required.

f. Publications which require change as a result of this inspection. NA

7. Supply/Parts and Disposition.

a. Parts required. As required to accomplish this TB.

b. Requisitioning instructions. Requisition replacement parts using normal supply channels.

c. Bulk and consumable material. As required.

8. Special Tools, Jigs, and Fixtures Required. Blade attachment expandable pin cleaning tool (Figures 1 thru 4).

9. Inspection Procedures. Inspect in accordance with TM-1520-237-PMS-2 and disassemble as necessary to permit the following inspections:

NOTE

Identification of components replaced on aircraft since their return from desert operations will decrease aircraft down time and expedite completion of requirements established by this TB as inspection of these components is not required.

a. In addition to items normally removed during PMS-2, these items will be removed for inspection and cleaning:

(1) Engines.

(2) Fuel cells, including liners and foam blocks.

(3) APU.

(4) Avionics/ASE/Instruments.

(5) Landing and searchlight assemblies.

(6) Mission equipment as necessary.

b. Inspect engine control start valve, sensing filters, and microswitch for sand and dust.

c. Inspect engine bleed air shutoff valve for open or closed jamming.

d. Inspect anti-ice valve for cleanliness and condition.

e. Inspect oil cooler blower blades for cleanliness and condition.

f. Inspect oil cooler radiator for cleanliness and condition.

g. Inspect gear box housing for damage to the paint system. Pay particular attention to the upper cavities of input gearbox housing where it attaches to the main transmission housing.

h. Inspect swashplate grease shield for debonding.

i. Inspect all bearings for sand entrapment.

j. Inspect hydraulic pump module drain lines for blockage.

k. Inspect main rotor blades expandable pins for cleanliness.

l. Inspect main rotor blade nickel abrasion strips for wear.

m. Inspect wire bundles and cannon plugs for sand entrapment and corrosion.

n. Inspect fairing assembly, PN's 70216-02403-041, located at station 288. buttline 50, reference datum 270. For UH-60 A/L aircraft prior to 8223748, inspect for installation of liner PN 70216-02403-136, and/or PN 70216-02403-138. If liner is not installed, fairing must be removed to facilitate cleaning and corrosion preventative measures.

o. Remove Pilot's and Co-pilot's air diffusers to facilitate cleaning of kevlar duct for sand entrapment, in accordance with TB 1-1500-200-20-30.

p. Inspect main rotor head for sand intrusion and corrosion.

q. Inspect engine cowling deck aft fitting for gouges.

r. Inspect ESSS pneumatic check valve for sand intrusion.

s. Inspect ESSS control valves for sand intrusion.

t. Inspect input pinion for axial play.

u. Inspect window upper track fairing for sand entrapment.

v. Inspect tail rotor gear box fitting for cracks.

w. Inspect all lower console control heads for sand intrusion.

x. Inspect swashplate uniball for sand entrapment.

y. Inspect all mission equipment for sand intrusion.

z. Inspect Engine cross bleed valve for sand and dust.

10. Correction Procedures.

NOTE

The following inspection/cleaning procedures must be performed in addition to the TM 1-1520-237-PMS-2 (500 hour) inspection.

a. Comply with the requirements of TB 1-1500-200-20-30.

NOTE

Sand ingested by the APU flows directly into the control valve during the start procedure. Sand and dust clog the sensing filter of the engine start control valve. As a result of the blockage of the air flow through the filter, the valve does not open sufficiently to activate the microswitch which holds the starter engaged until the engine starts.

b. Clean engine start control valve (PN 70306-02107-104) IAW TM 1-1520-237-23-4, Para 7-4-3.

c. Clean engine bleed air shutoff valve, (PN 70306-02102-103, -104, -105) IAW TM 1-1520-237-23-4, Para 7-4-4 and Para 7-5-1.

d. Clean Engine inlet anti-icing valve system (PN 70306-10019-042 and PN 70306-10012-107) IAW TM 1-1520-237-23-7, Para 12-4-22.

e. Clean Pneumatic Check Valve, PN 70307-428-09-101 IAW TM 1-1520-237-23-8, Para 16-4-66.

NOTE

Air can only travel in direction of flow arrow.

f. Clean HSS bleed air regulator valves, PN 70307-42180-102 IAW TM 1-1520-237-23-8, Para 16-4-71.

g. Clean oil cooler blower. Clean oil cooler blades where they fit inside the bell shaped rotor.

h. Clean pneumatic ground start valve, PN NH1004209-10.

(1) Remove nipple check valve (refer to TM 1-1520-237-23-4, Para 7-4-10).

(2) Clean sand and dirt from the pneumatic tube and doubler assembly with a clean piece of cloth.

(3) Clean pneumatic nipple check valve by spraying generous amount of cleaning solvent (MIL-PRF-680 or equivalent) around flapper hinges. Use a soft wire brush, if necessary, to remove dirt and sand around the flapper hinges.

(4) Blow dry the valve assembly with compressed air to remove any residue material and solvent around the flapper hinges.

(5) Reinstall nipple-check valve (refer to TM 1-1520-237-23-4, Para 7-4-10).

i. Clean oil cooler radiator.

(1) Remove radiator from duct.

(2) Drain and cap off both ports with plastic plugs to prevent water entry.

(3) Wash/clean inlet (lower) surface by rinsing the top side toward the inlet (lower) surface with fresh water.

(4) Reinstall radiator.

(5) Reservice transmission to correct level.

j. Gear box housing. Treat all magnesium gear box housings if there is damage to the paint system per TM 1-1520-237-23.

k. Inspect/clean main rotor head. Remove main rotor head per TM 1-1520-237-23-3.

NOTE

Disassemble main rotor head assembly as necessary to perform the following inspection. Refer to TM 1-1520-237-23-3, Section 5-4 for damage limit.

(1) Inspect/clean upper and lower pressure plates.

(2) Inspect/clean split cones.

(3) Inspect/clean cone puller.

(4) Inspect/clean inside and outside diameter of shaft extension.

l. Swashplate.

(1) Remove swashplate per TM 1-1520-237-23-5.

(2) Repair swashplate grease shield if debonding is evident per TM 1-1520-237-23-3.

(3) Purge and relube the swashplate through grease fittings per TM 1-1520-237-23-1, Para 1-5-3.

m. Clean caution panels, connectors and lower console control heads.

(1) Remove all caution panels, connectors and lower console control heads.

(2) Remove faceplates and backplates where applicable.

(3) Wipe off exterior of panels and switches.

(4) Vacuum all connectors and receptacles.

(5) Clean and preserve connectors with CPC (MIL-C-81309, Type III).

(6) Install face plates and back plates.

(7) Reinstall caution panels and connectors and lower console control heads.

(8) Lower circuit breaker panels and overhead console and vacuum.

(9) Raise circuit breaker panels and overhead console.

n. Clean window upper track fairing installation.

NOTE

The following inspection should only be performed on aircraft prior to 82-23748.

(1) Inspect fairing assembly located at station 288, buttline 50, reference datum 270, for accumulation sand/dirt.

(2) Vacuum away sand/dirt from the fairing.

(3) Apply MIL-DTL-85054, Type I, to fairing assembly.

o. Inspect tail rotor gear box fitting. Inspect tail rotor gearbox fitting for cracks. Pay particular attention to lower right hand side corner of the fitting.

p. Clean hydraulic pump module.

(1) Disconnect drain line at bottom of reservoir.

WARNING

Degreasing Solvent, MIL-PRF-680, is combustible and toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well ventilated areas (or use approved respirator as determined by local/industrial hygiene personnel). Keep away from open flames or other sources of ignition.

(2) Flush degreasing solvent, MIL-PRF-680, through the line.

(3) Reconnect drain line.

q. Inspect/clean bearings.

NOTE

Disassemble flight control assemblies as necessary to perform the following inspection/cleaning.

(1) Inspect all bearings for sand entrapment.

(2) Wipe off, brush, or blow away sand from bearings.

(3) Purge and relubricate mixer bellcranks (refer to TM 1-1520-237-23-1, 111-5-4).

NOTE

This patch must be installed on all the aft fittings regardless of damage to the fittings.

r. Install wear patch on the engine cowling deck aft fitting assembly, RH/LH (PN 70302-02158-041) IAW TM 1-1520-237-23-2, 2-4-131.1.3.

s. Clean wiring harness. Vacuum all wiring harness.

t. Clean blade expandable pin, PN 70103-08107-101.

(1) Fabricate expandable pin cleaning tool per Figures 1, 2 and 3.

(2) Make tool from any one of the following materials:

(a) 7075-T651 or T7351 Aluminum bar rod, per SAE-AMS-QQ-A-225 or ASTM-B211.

(b) 7075-T6511 or T73511 Aluminum bar or rod, per SAE-AMS-QQ-A-225 or ASTM-B211.

(c) 6061-T651 Aluminum bar or rod, per SAE-AMS-QQ-A-225 or ASTM-B211.

(d) 6061-T651 Aluminum bar or rod, per ASTM-B241, ASTM-B221, or SAE-AMS-QQ-A-200.

(3) Surface finish to be 63RMS or better.

(4) Break sharp edges 0.005 - 0.015” radius or chamfer optional.

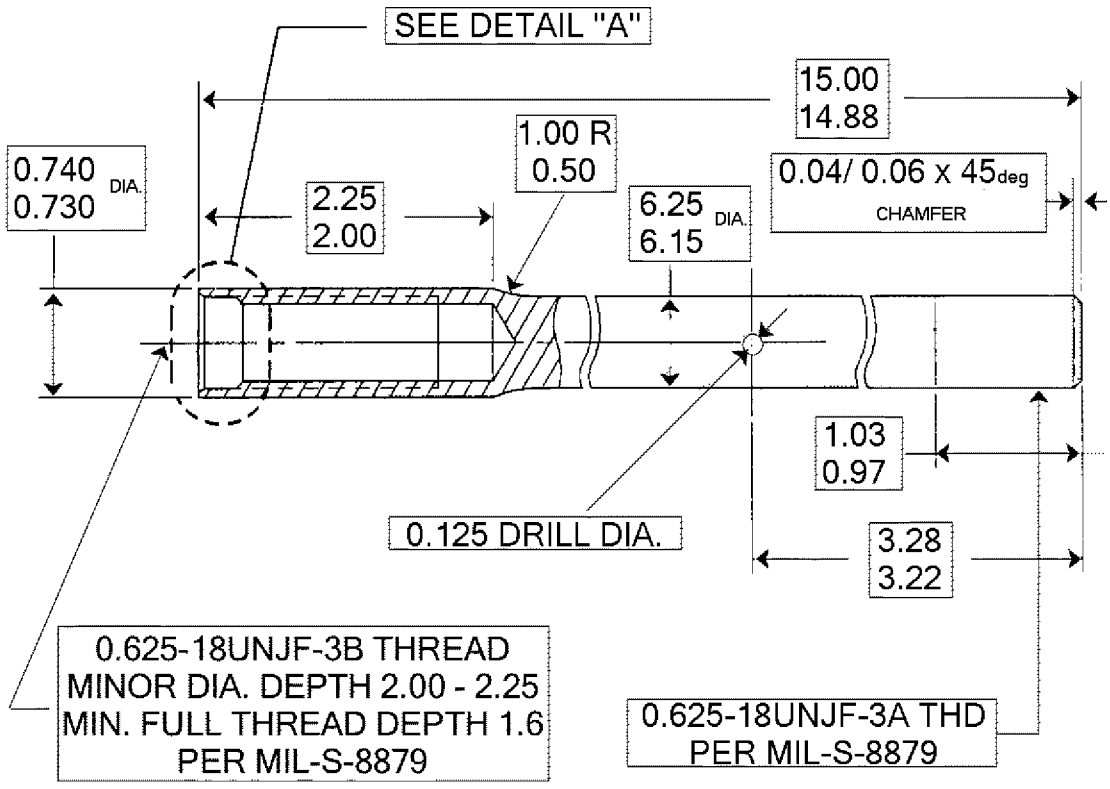


Figure 1. Fabrication of Expandable Pin Cleaning Tool

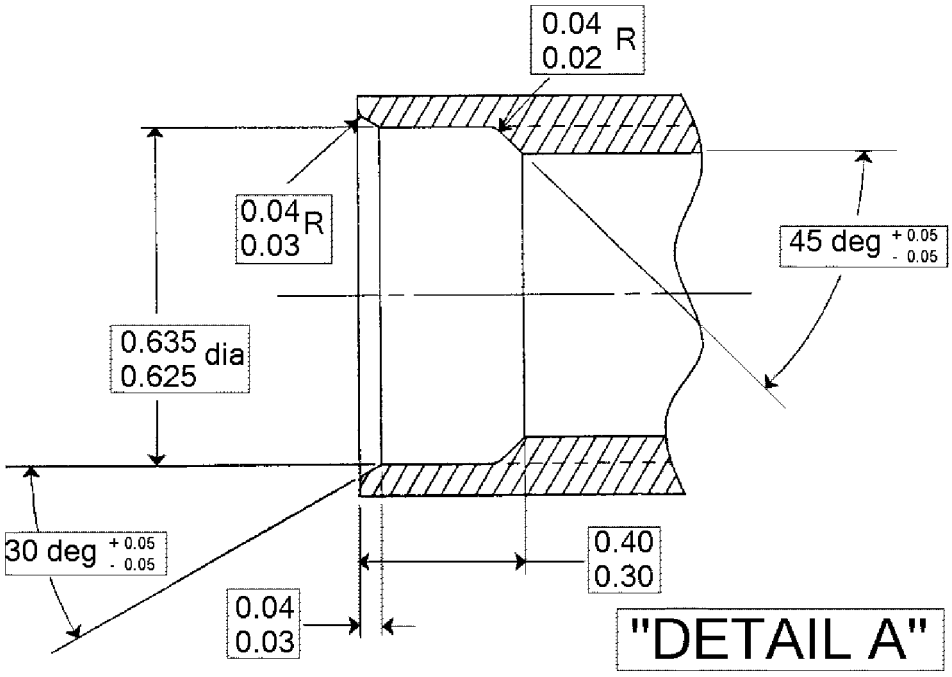


Figure 2. Fabrication of Expandable Pin Cleaning Tool Detail

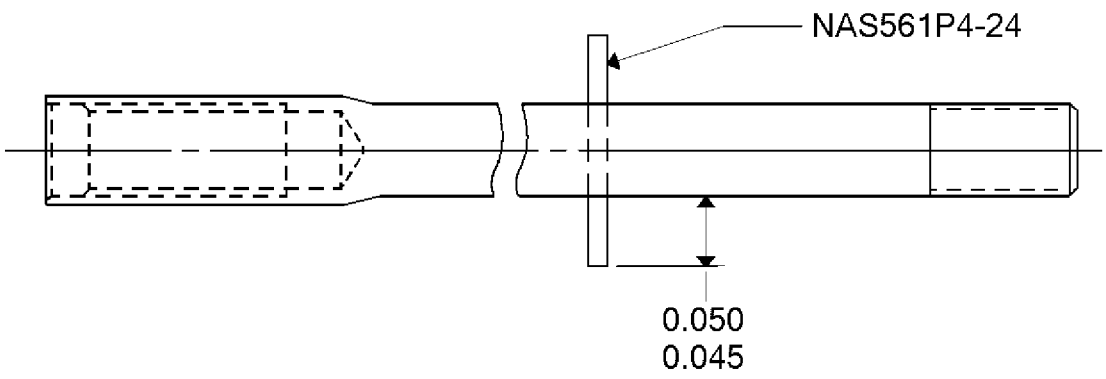


Figure 3. Fabrication of Expandable Pin Cleaning Tool

(5) Use tools as follows:

(a) Open handle to relax pin segments.

(b) Lock handle joint in vise with segments aimed upward as shown in Figure 4. Sheet 1.

(c) Hold segments with one hand and remove nut using appropriate wrench.

(d) Remove lockring and first segment. Install lockring and first segment on male threaded end of tool in same orientation as removed from the pin. Loosely thread nut so segment and lockring move freely (Figure 4, Sheet 2).

(e) Install cleaning tool onto threaded end of pin until firmly seated. Hand tighten only.

(f) Remove assembly from vise.

(g) Holding segments on pin, invert assembly so handle end is up.

(h) Slowly lower segments onto cleaning tool.

(i) Immerse assembly into a bath of mild soap and warm water.

NOTE

Segments are separated on the Expandable Pin Cleaning Tool. Do not remove segments from tool.

(j) Separate segments under water to clean inside diameters of segments.

(k) Separate the lockring from the first segment removed in step (d) and clean as described above.

(l) Thoroughly rinse assembly by flooding with generous amount of water and separating segments.

(m) Separate segments and dry assembly using air gun.

(n) Dry swivel joint where handle attaches.

(o) Allow to air dry 30 minutes.

(p) Hold segments against roll pin and invert assembly.

(q) Slowly lower segments onto pin shaft until seated against washer. Ensure segments are properly engaged with each other.

(r) With segments aimed in an upward direction, lock assembly into vise.

(s) Holding segments with one hand, remove cleaning tool from end of pin.

(t) Remove nut, lockring, and first segment removed in step (5)(d) from end of tool and install onto threaded end of pin, orientated in the same direction as removed.

(u) Snap lockring onto first segment.

NOTE

Be careful not to pinch fingers between segments when removing assembly from vise.

(v) Remove assembly from vise.

(w) Closing force check will be done IAW TM 1-1520-237-23-3 during installation.

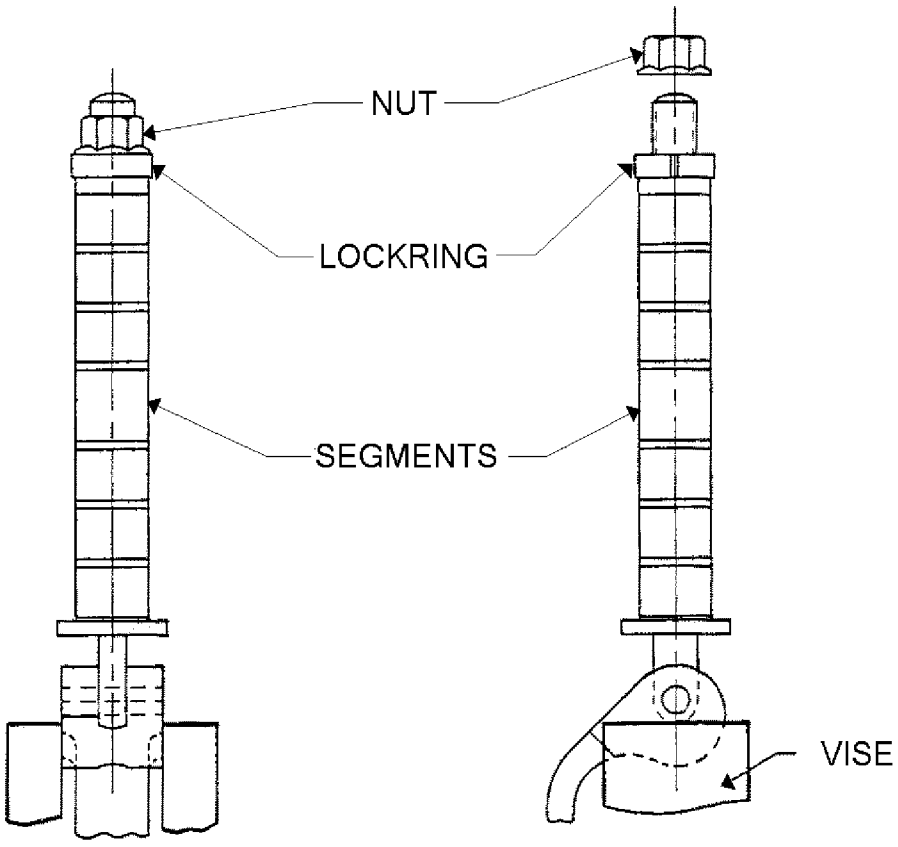


Figure 4. Sheet 1. Use of Expandable Pin Cleaning Tool

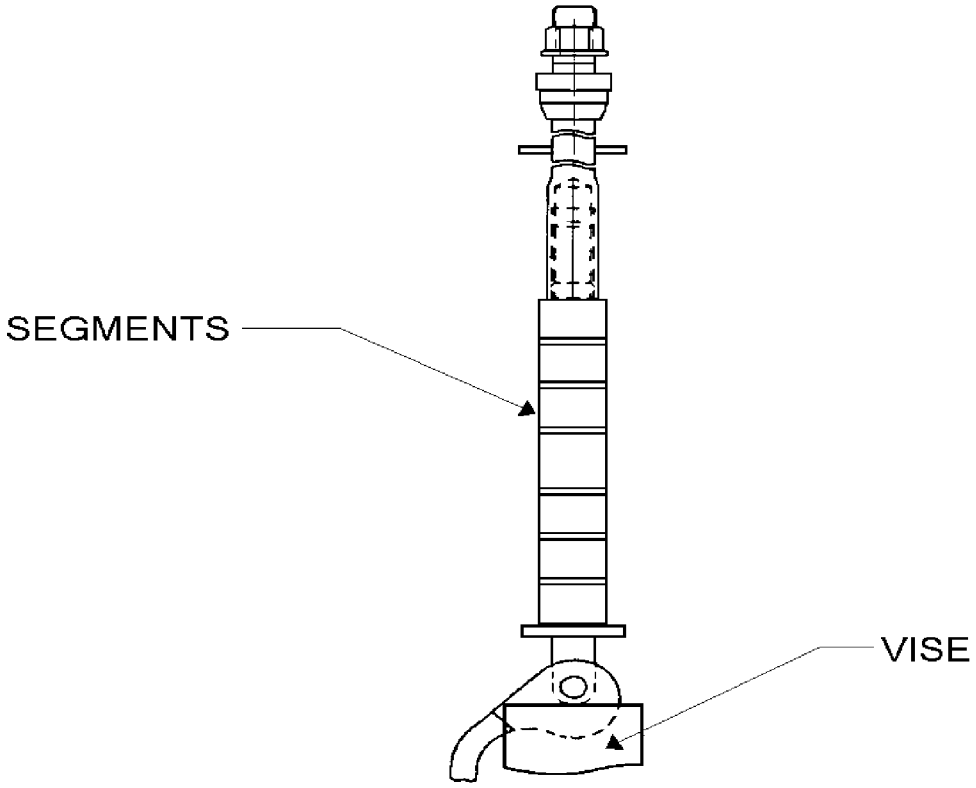


Figure 4. Sheet 2. Use of Expandable Pin Cleaning Tool

u. Corrosion control requirements for HH/UH-60.

(1) Thoroughly clean aircraft IAW TM 1-1520-237-23-1.

(2) Forward avionics bay.

(a) Apply MIL-DTL-85054 to all seams and under avionics boxes.

(b) After verifying ground, seal all grounding studs using MIL-PRF-81733, Type I.

(c) Prior to installation of common hardware, apply MIL-C-81309, Type II, Class I, to the shank of attachment hardware.

(d) Clean and preserve all electrical connectors, plugs, and receptacles IAW TM 1-1520-237-23-1.

(3) Crew compartment.

(a) Apply MIL-DTL-85054 to the crew compartment area under pilot and co-pilot seats and under tail rotor control pedals.

(b) Seal all antenna installations using MIL-PRF-81733.

(c) Apply MIL-C-81309, Type II, Class I, to the tension adjust cables.

(d) Apply MIL-C-81309, Type II, Class I, to the crew seat adjust cables.

(e) Clean landing light fairing interior and apply MIL-DTL-85054, insuring that the landing light fairing drain hole is clear.

(4) Troop compartment.

(a) Clean battery compartment. Apply MIL-DTL-85054, to area under battery. Clean and preserve electrical connectors IAW TM 1-1520-237-23-1.

(b) Clean and then apply MIL-DTL-85054 to the aircraft bilge. Careful attention should be taken to clean the area of the cargo hook.

(c) Inspect all cargo and troop seat attachment hardware for corrosion. Repair all corrosion detected IAW TM 1-1520-237-23. Apply MIL-DTL-85054 to the bottom of all attachment hardware.

(d) Apply MIL-C-81309, Type II, Class I, to the inside of the troop seat tubes.

(e) Apply MIL-C-81309, Type II, Class I, to all troop seat wire rope assemblies.

(5) Upper pylon.

(a) Apply MIL-DTL-85054 to all water traps; in particular, traps caused by upper fairing rails and the traps on the input modules.

(b) Apply MIL-DTL-85054 to all main transmission attachment hardware and flight control alignment points.

(c) Apply Lubriplate, MIL-C-81309, Type II, Class I, to the main rotor bifilar washers.

(d) Apply MIL-DTL- 85054, to area under oil cooler.

(e) Apply MIL-C-81309, Type II, Class I to the gust lock and gear.

(f) Apply MIL-C-81309, Type III, Class I, to tail landing gear lock pin hardware.

(6) Transition section.

(a) MIL-DTL-85054 will be applied to the interior skin beneath the fuel cells prior to reinstallation of the fuel cells.

(b) Apply MIL-DTL-85054 to the bottom interior skin of the aircraft from just above the fuel cells to the tail. This application will cover the entire lower portion up to approximately 12 inches above the bottom.

(c) Seal all antennas using MIL-PRF-81733. Preserve the mounting area with MIL-C-81309, Type II, Class I, and ensure the drain holes are clear.

(d) Apply MIL-DTL-85054 to the area under the intermediate gear box (IGB) and the IGB attachment hardware.

(e) Apply MIL-C-81309, Type II, Class I, to exposed portions of the tail rotor control cables.

(f) Apply MIL-C-81309, Type II, Class I, to all hinges.

(g) Apply MIL-C-81309, Type III, Class I, to tail landing gear lock pin hardware.

(h) Apply MIL-DTL-85054 to area below engine exhaust area.

(7) Tail pylon.

(a) Apply MIL-DTL-85054 to tail rotor attachment hardware.

(b) Apply MIL-C-81309, Type II, Class I, to the stabilator attachment hardware.

(c) Clean and preserve all electrical connectors in accordance with Paragraph 10v.

v. Water displacement and treatment . Not applicable to engine connectors. Clean engine connectors IAW TM 1-2840-248-23. After corrosion removal/cleaning or at anytime connectors, plugs, or receptacles are separated for maintenance, treat as follows.

WARNING

•Corrosion preventive compound, MIL-C-81309 is flammable and toxic. Good general ventilation is normally adequate. Skin and eye protection is required. Avoid all sources of ignition.

•Isopropyl Alcohol is flammable and toxic to eyes, skin, and respiratory tract. Wear protective gloves and goggles/face shield. Avoid repeated or prolonged contact. Use only in well-ventilated areas (or use approved respirator as determined by local safety/industrial hygiene personnel). Keep away from open flames, sparks or other sources of ignition.

NOTE

The application of Water Displacing Corrosion Preventive Compound, Ultra-thin Film, MIL-C-81309, Type III, Class I, will assist in displacing any moisture present from the metallic surfaces in connector internal sections.

(1) Using an acid brush (Materials List, Item 2), apply Isopropyl alcohol, TT-I-735 liberally to the internal and external sections of the connectors, both male and female. Mate and unmate connector several times to clean. Rinse again with Isopropyl Alcohol and allow to dry.

(2) Apply a light film of MIL-C-81309, Type III, to the internal sections of the connectors, plugs, and receptacles. Compound may be applied using a manual spray atomizer (Material List, Item 8), or spraying the aerosol Type CPC identified for local purchase.

(3) Tilt connector down, if possible, to drain excess. Wipe off excess preservative with cloth, (Material List, Item 4)

(4) Prior to connecting threaded sections of connector, plug, or receptacle back shells, treat threaded area with CPC, (Material List, Item 1).

(5) Mate connector sections. Wipe off excess preservative with Cleaning Cloth CCC-C-46, Class 7 (Materials List, Item 4).

WARNING

Corrosion Preventive Compound, MIL-DTL-85054 is flammable and toxic. Good general ventilation is normally adequate. Skin and eye protection is required. Avoid all sources of ignition.

CAUTION

Corrosion Preventive Compound, MIL-DTL-85054 cures to a hard, permanent finish. Once cured, it cannot be removed using Isopropyl Alcohol or any other approved solvents. Excessive reapplication of MIL-DTL-85054 should be avoided. For connectors requiring frequent mating and unmating, use MIL-C-81309, Type III, Class I, in lieu of MIL-DTL-85054.

(6) Apply film of MIL-DTL-85054, Type I, to the shell (exterior) or connectors, plug, and receptacles.

w. If main rotor blade nickel abrasion strip is worn through/damaged, replace the main rotor blade.

x. Touch up paint as required per TM 55-1500-345-23.

y. Refer to TM 1-1500-328-23 Paragraphs 4 and 5 for information concerning handling of TBO components.

MATERIALS LIST

ITEM	NSN	SPECIFICATION	NOMENCLATURE	U/I	SLC
1	8030-01-347-0978	MIL-C-81309 Type III, Class I	Corrosion preventive compound, water displacing, ultra-thin film	gl	4
2	7920-00-514-2417	A-A-289	Brush, acid, swabbing	bx	
3		TT-I-735	Isopropyl alcohol	cn	
4	7920-01-180-0556	CCC-C-46 Type I, Class 7	Cloth, cleaning non-woven fabric	bx	
5	8030-01-045-4780	MIL-DTL-85054, Type I	Corrosion preventive compound, water displacing, clear	cn	4
6		MIL-C-81309, Type II, Class I	Corrosion preventive compound, water displacing, ultra-thin film	cn	4
7		MIL-PRF-81733 Type I (brush application)	Sealing compound polysulfide	cn	2
8	8125-00-488-7952	A-A-2806	Bottle, plastic, manual, spray atomizer	ea	

11. Weight and balance. NA

12. Recording and reporting requirements. Per DA Pam 738-751.

13. References

a. TM 1-1520-237-PMS-2, dtd 28 June 1996

b. TM 1-1520-237-23-series, dtd 29 May 1998.

c. TB 1-1500-200-20-31, dtd TBD.

d. TM 1-1500-328-23, dtd 30 July 1999

14. Points of contact.

a. Technical point of contact for this TB is MR. Gary Trotter, AMSAM-RD-AE-I-D-U, DSN 897-2350, ext 9693, Alternate number is DSN 897-2350 or (256) 705-9715, fax is (256) 705-9896. Email is "gary.trotter@rdec.redstone.army.mil".

b. Logistical point of contact for this TB is Mr. Joe Hoover, SFAE-AV-UH-L, DSN 645-7898 or (256) 955-7898. Fax is DSN 897-3778 or (256) 955-3778. Email is "joe.hoover@uh.redstone.army.mil".

c. Forms and records point of contact is Ms. Ann Waldeck, AMSAM-MMC-MA-NM. DSN 746-5564 or (256) 876-5564. Fax is DSN 746-4904. Email is "ann.waldeck@redstone.army.mil".

d. Publications Point of contact is Ms. Paula Katke-Eberhart, AMSAM-MMC-AV-UA, DSN 897-1179, fax DSN 897-4769 or (256) 313-4769. Email is "paula.katke-eberhart@redstone.army.mil".

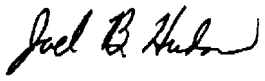
e. After hours, contact AMCOM Command Operations Center (AOC) DSN 897-2066/7 or (256) 313-2066/7.

15. Reporting of Errors and Recommended 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), or DA Form 2028-2, directly to: Commander, US Army Aviation and Missile Command, ATTN: AMSAM−MMC−MA−NP, Redstone Arsenal, AL 35898−5000. 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 bulletin. For the World Wide Web use: https://amcom2028.redstone.army.mil.

By Order of the Secretary of the Army:

JOHN M. KEANE
General, United States Army
Acting Chief of Staff

Official:



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Administrative Asssistant to the
Secretary of the Army
0316802

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To: 2028@redstone.army.mil

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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
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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:***

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