

# DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

## MAIN ROTOR SYSTEM HARDWARE FOR AH-64 BLADE FOLD KIT

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

30 June 2004

### REPORTING 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, US Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5230. 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.

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

- 1. PURPOSE.** The purpose of this TB is to enhance transportability.
- 2. PRIORITY.** This TB is classified "Routine".
- 3. END ITEM.** The following end items shall have the hardware and bonding jumpers installed in accordance with the instructions contained in Paragraph 10.

Nomenclature	National Stock Number	Type and Model	Serial Number
Helicopter, Attack	1520-01-355-8250	AH-64D	N/A
	1520-01-106-9519	AH-64A	

**4. MODULES (Components, Assemblies, Subassemblies, Boards, and Cards) TO BE INSTALLED.** Not applicable.

\*This TB supersedes TB 1-1520-238-20-135 dated 6 May 2003.

## TB 1-1520-238-20-135

### 5. REQUIRED.

#### 5.1 PARTS

NOMENCLATURE	PART NUMBER	NSN	Quantity
Bushing-Anchor, upper	7-311412116-1	3120-01-471-6582	8
Bushing-Anchor, lower	7-311412117-1	5310-01-471-5966	8
Washer, Flat	NAS1149F1232P		16
Bolt, shear hex head	HS6035-01	5606-01-471-2910	8
Nut, self-locking	HS262-1216	5310-01-164-5854	8
Bolt, shear-hexagon head	NAS1305-3	5306-01-150-3993	8
Washer, flat	NAS1149D0563J	5310-01-123-0913	16
Nut, self-locking	MS21042L5	5310-01-807-1476	8
Washer, flat	NAS1149C0663R	5310-01-167-0804	16
Bolt	MS21250-06050	5306-01-197-0463	8
Nut, self-locking	HS262-624	5310-01-184-0354	8
Jumper	HS5509-18-DE-3		8
Bolt	NAS1306-2	5306-00-078-0145	8
Nut, self-locking	MS21042L6	5310-00-807-1477	8
Washer, flat	NAS1149D0663J	5310-01-395-3930	16
Clip	7-311412119-1		8
Strap, tie-down	MS3367-1-0	5975-00-984-6582	8

#### 5.2 Safety Wear.

NOMENCLATURE	PART NUMBER	NSN
Utility, Apron	A-A-55603	8415-00-082-6108
Gloves, Chemical Protection	ZZ-G-381	8415-00-266-8677
Adj Respirator, Air Filter	85556	4204-00-883-6519
Goggles, Industrial	ANSI Z87.1	4204-00-052-3776

### 6. APPLICATION -

6.1 Level of Maintenance: AVUM

6.2 Time required: N/A

### 7. REFERENCES -

7.1 Interactive Electronic Technical Manual (IETM): TM 1-1520-Longbow/Apache IETM, CD No. 1, Version 3.1.2, Dated 29 May 02, CD Date 1 Dec 01 or subsequent.

7.2 TM 1-1520-238-23, Aviation Unit and Intermediate Maintenance Manual for AH-64A Apache Attack Helicopter, 16 May 94.

7.3 TM 1-1520-238-23P, Aviation Unit and Intermediate Maintenance Repair Parts and Special Tools List for AH-64A Apache Attack Helicopter, 28 May 96.

**8. SUPPLY KITS/PARTS AND DISPOSITION –**

- 8.1 TB kits supplied by: PEO Aviation SFAE-AV-AAH-LF.
- 8.2 TB kits authorized only for: AVUM.
- 8.3 Bulk and Consumables:

NOMEMCLATURE	PART NUMBER	NSN
Paint, Red	EPB-4-230/D4	N/A
Lubricant, Solid Film	HMS4-1078	9150-01-480-4237
Corrosion Preventative Compound	MIL-C-16173*C2GR4	8030-01-396-5738
Sealing Compound	MIL-S-81733	8030-00-008-7198
Sealing Compound (alt)	HMS16-1097*T2CB-1/2	8030-01-476-2255

8.4 Parts Disposition: Disposition of parts removed and not used during installation of this TB will be in accordance with proper disposal procedures.

**9. SPECIAL TOOLS, JIGS, TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE), AND FIXTURES REQUIRED –**

NOMEMCLATURE	PART NUMBER	Quantity
Miliohm meter		1

**10. PROCEDURES –**

**WARNING**

Use solid film lubricant only in well ventilated areas. Keep away from flames or sparks. Harmful if inhaled. If injury occurs, seek medical aid.

**CAUTION**

Ensure that a Foreign Object Damage (FOD) prevention program is implemented during application of this TB in accordance with AR 385-95.

**NOTE**

Determine run-on torque by using a torque wrench and rotate the nut for a minimum 180 degrees while observing the torque wrench reading. Ensure the nut is not seated against the washer and at least one thread protrudes past the nut. The resultant observed torque should be added to the ranges listed in the task steps.

10.1 All threads shall be sprayed per HP4-75 or MIL-PRF-46417C, with a coat of HMS4-1078\* Type 1 lubricant before installation.

**CAUTION**

Do not heat ferrous parts over 350 degrees F or nonferrous parts over 250 degrees F damage may result.

Do not cool bearings and bushings below -321 degrees F. Damage may result.

## TB 1-1520-238-20-135

10.1.1 Cure per the following:

10.1.1.1 30 minutes at room temperature.

10.1.1.2 Then 30 minutes at 140 –160 degrees F.

10.1.1.3 Cool at ambient temperature.

10.2 Safe aircraft per paragraph 7.

10.3 On each of the 4 main rotor pitch change housings locate the eight 7-211411188 clips referencing (6) (Fig. 1).

10.4 Disassemble the bonding jumper and discard attaching hardware referencing (Fig. 1).

10.5 Remove Damper Rod End/Lead Lag Link hardware. Retain the clips, P/N 7-211411188, washers, P/N MS9549-17 (located between the Damper Rod End and the Lead Lag Link) and bushing, sleeve, P/N 7-211411198-7 for reinstallation while discarding all remaining hardware.

10.6 Coat shank and head of bolts with corrosion preventative compound. Install bolts, NAS1305-3, clips, 7-211411188, washers NAS1149F1232P, bushings 7-311411198-7, washers MS9549-17, and nuts, HS262-1216 referencing (Fig. 4) Ensure the clips are installed 180 degrees from the original installation. Torque nut HS262-1216 to 650-700 inch-pounds.

10.7 Attach bond jumper P/N HS5509-18E-3 along with the existing bond jumper P/N MS25083-2DD7 using, bolts, NAS1306-2, washers NAS1149D0663J, and nuts MS21042L6 referencing (Fig. 3). Torque nuts, MS21042L6, to 60-85 inch-pounds.

10.8 On each of the 4 main rotor blades locate bond jumper P/N HS5509-11-DE-3 and attaching hardware referencing bolt (11), washer (15), lead (5), washer (14 and 13) and nut (12) (Fig. 1).

10.9 Remove and discard bond jumper P/N HS5509-11-DE-3 and attaching hardware referencing bolt (11), washer (15), lead (5), washer (14 and 13) and nut (12) (Fig. 1).

### NOTE

Ensure that the concave side of the bushings anchors face the bolt head and the nut/washer stack up.

10.10 Install bolts, MS21250-06050, upper bushing anchors, 7-311412116-1, clips, P/N 7-311412119-1, lower bushing anchors, 7-311412117-1, washers, NAS1149C0663R, and nuts, HS262-624 referencing (Fig. 3). Ensure the clips are positioned per (Fig. 2) Torque nuts, HS262-624, to 360-390 inch-pounds.

### NOTE

When installing the bonding jumpers, ensure the leading jumper from the lead lag link/damper clip is installed to the lagging clip on the blade root and that the lagging jumper is installed on the leading clip on the blade root.

### NOTE

The bolt (MS21250-06050), upper anchor bushing (7-311412116-1), clip (7-311412119-1), blade root bushing (7-311412114-5), lower anchor bushing (7-311412117-1), washers (NAS1149C0663R) and nut (HS262-624) as referenced in Figures 3 and 5 as an assembly, may rotate in blade after the assembly is torqued. This rotation is acceptable and the assembly is per engineering design.

10.11 Install bolts, NAS1306-2, washers, NAS1149D0663J, nuts, MS21042L6, bonding jumper, HS5509-18-DE-3, to clips 7-311312119-1 referencing (Fig. 3). Torque nuts, MS21042L6 to 90-110 inch-pounds.

10.12 Route bond jumper P/N HS5509-18-DE-3 referencing (Fig. 2). Attach other end of the bond jumpers P/N HS5509-18-DE-3 to the clips P/N 7-311412119-1 using kitted hardware, (Fig. 3).

**NOTE**

After installation ensure a minimum gap of .20 exists between bottom of NAS1306-2 Bolt Head and Main Rotor Blade. Bend clip to acquire appropriate gap.

10.13 Using tie down straps, P/N MS3367-1-0 secure bond jumpers to each other referencing (Fig. 2).

10.14 Perform class S electrical bond check per HP14-30 or MIL-STD-464 between the 7-211411188 clip and the 7-311412119-1 bracket referencing (Fig. 3 and 4).

**WARNING**

**Sealant is flammable and toxic to eyes, skin and respiratory tract. Skin/eye protection required. Avoid repeated or prolonged contact. Good general ventilation is normally adequate. If injury occurs, seek medical aid.**

**NOTE**

Ensure sealant is limited to chamfer at base of threads and clips (7-311412119-1) is parallel to place as shown in figure 2 prior to sealing.

10.15 Using sealing compound P/N HMS16-1097\*T2CB 7/2 or NSN 8030-01-396-5738, seal all joints between bolts, nuts, washers, collars and clips to ensure no moisture seepage between parts. When sealing around outside of 7-311412116-1 and 7-311412117-1 bushings, limit sealant to chamfer at base of threads. Outside diameter of bushings to be free of sealant. A 24 hour cure time is required (Fig. 5).

10.15.1 Fill 7-311412116-1 bushing with sealant to top of cup to avoid pooling or retaining moisture around joint.

10.15.2 Otherwise apply sealant sparingly, do not pot or glob areas.

10.16 Using red paint, type EPB4-230/D4 apply new blade folding fixture alignment stripes per dimensions on (Fig. 6). Use of shop aid is allowable.

10.17 Anytime there are replacements to the Main Rotor Head or Blade on a modified aircraft that has been affected by this TB, the user must ensure that all parts installed from this TB are transferred on to the new component. If the entire kit is to be removed, ensure all added parts are retained for future installation.

**11. CALIBRATION REQUIRED – N/A.**

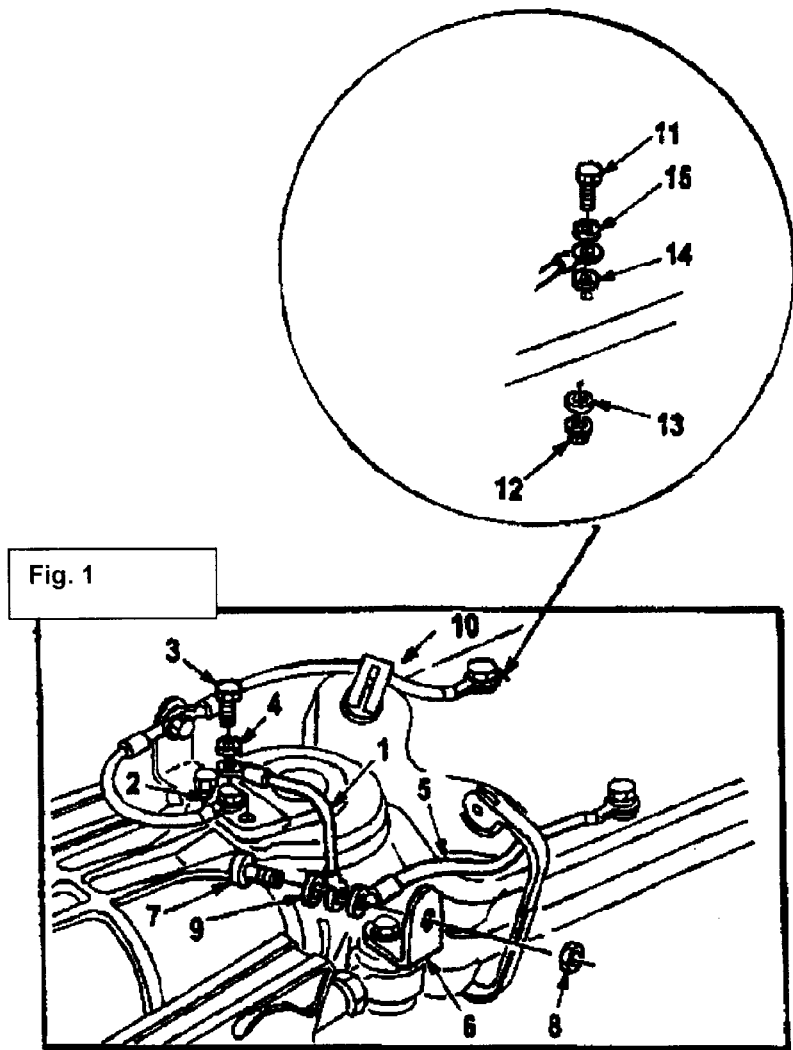


Fig. 1

Fig. 2

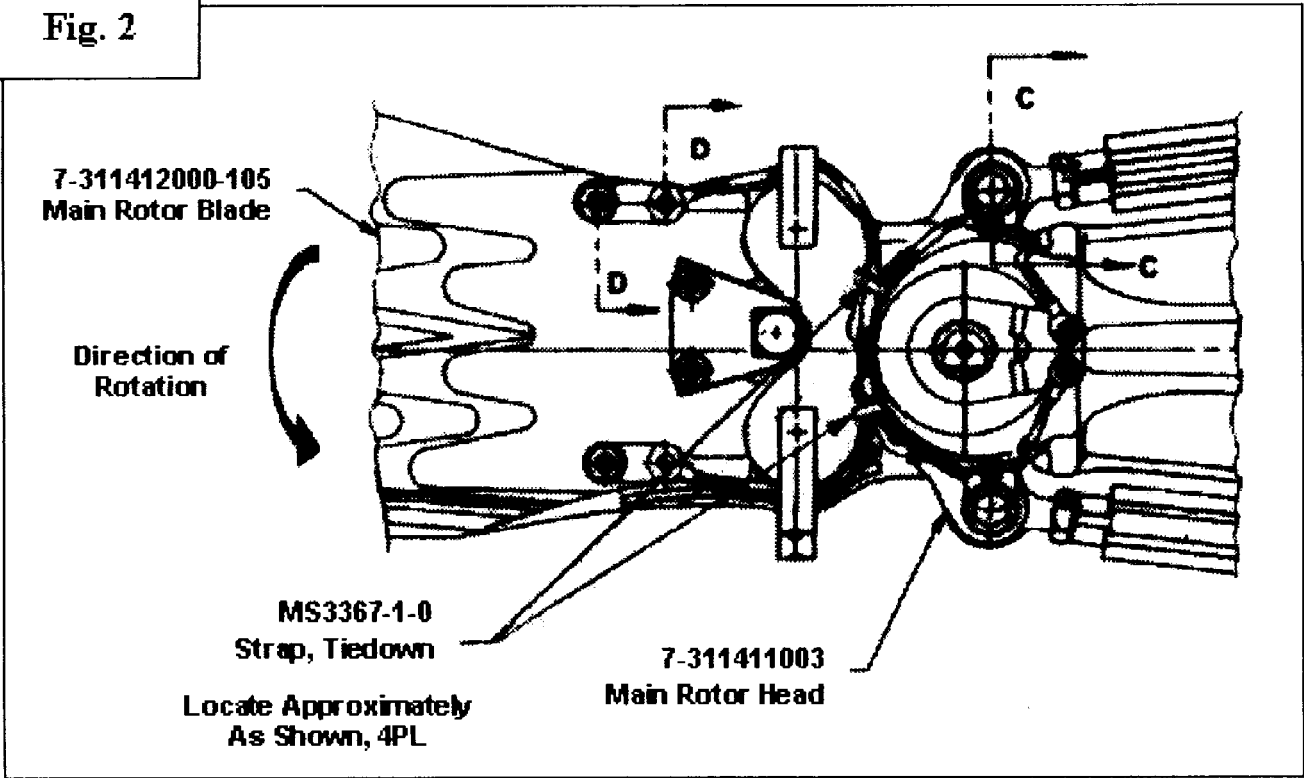
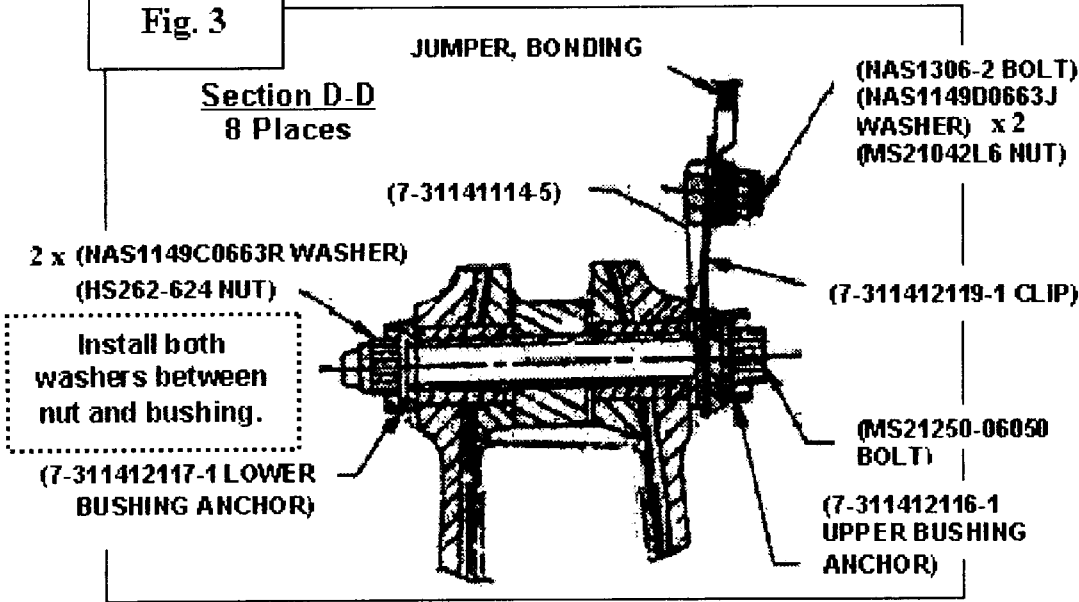
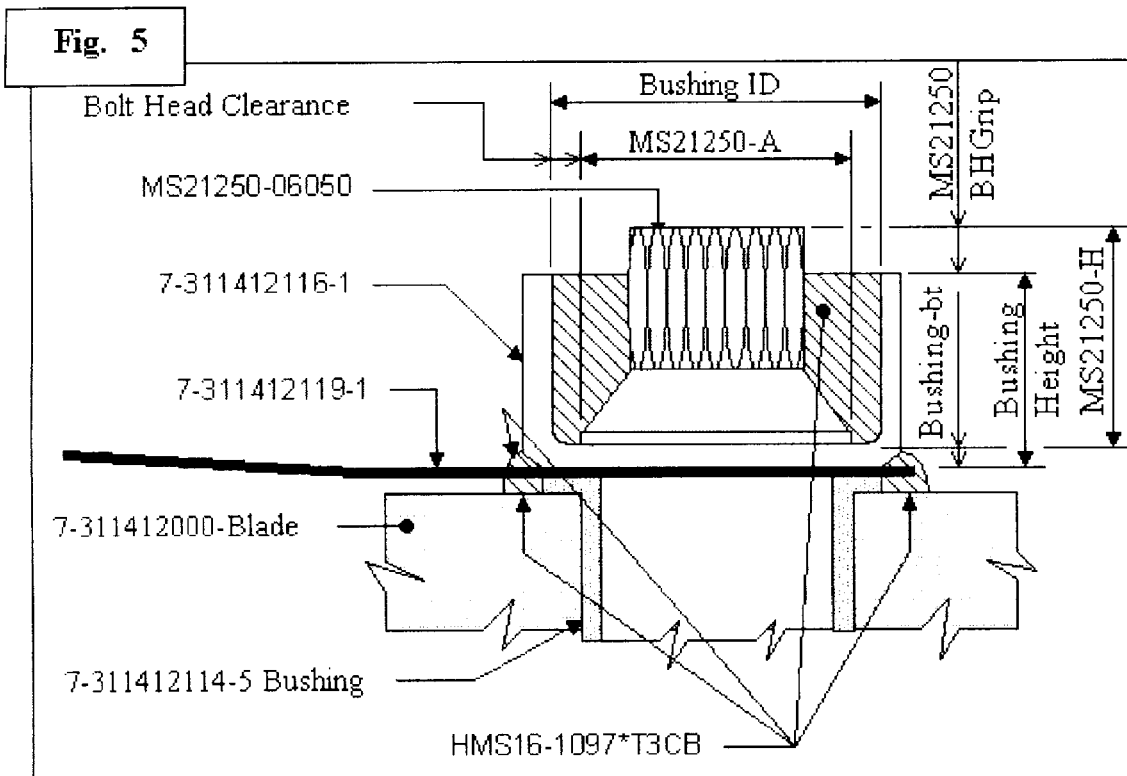
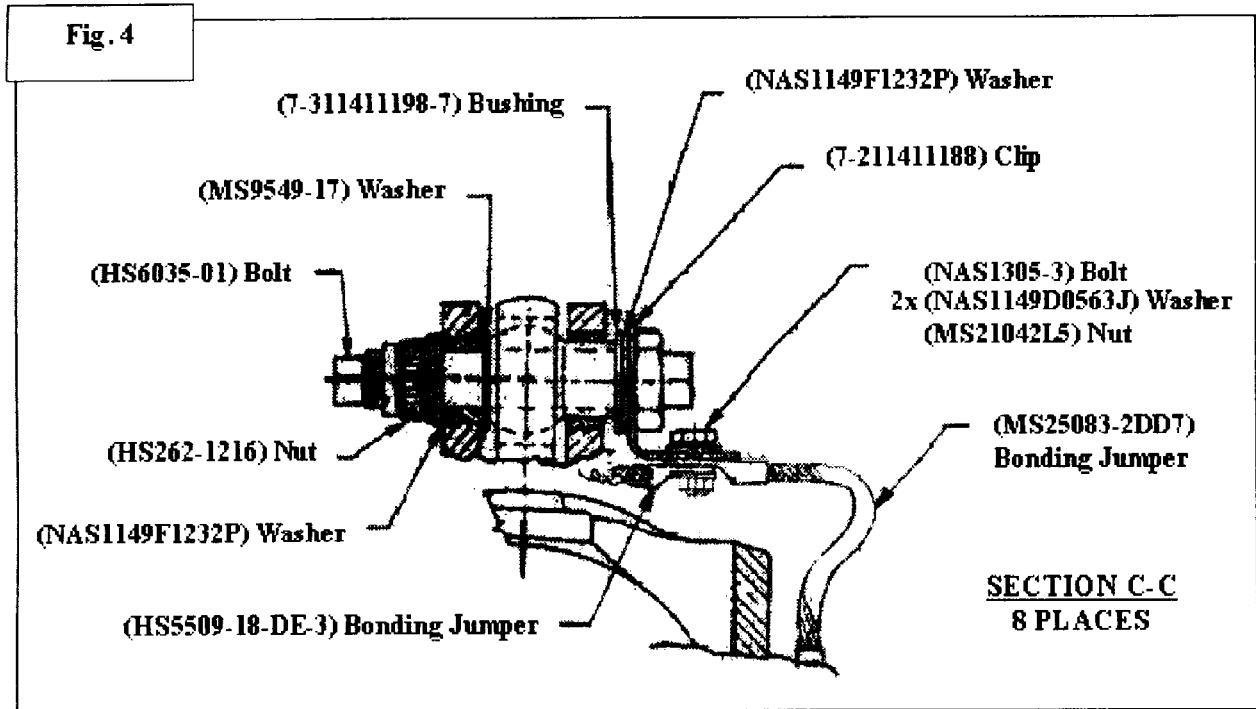
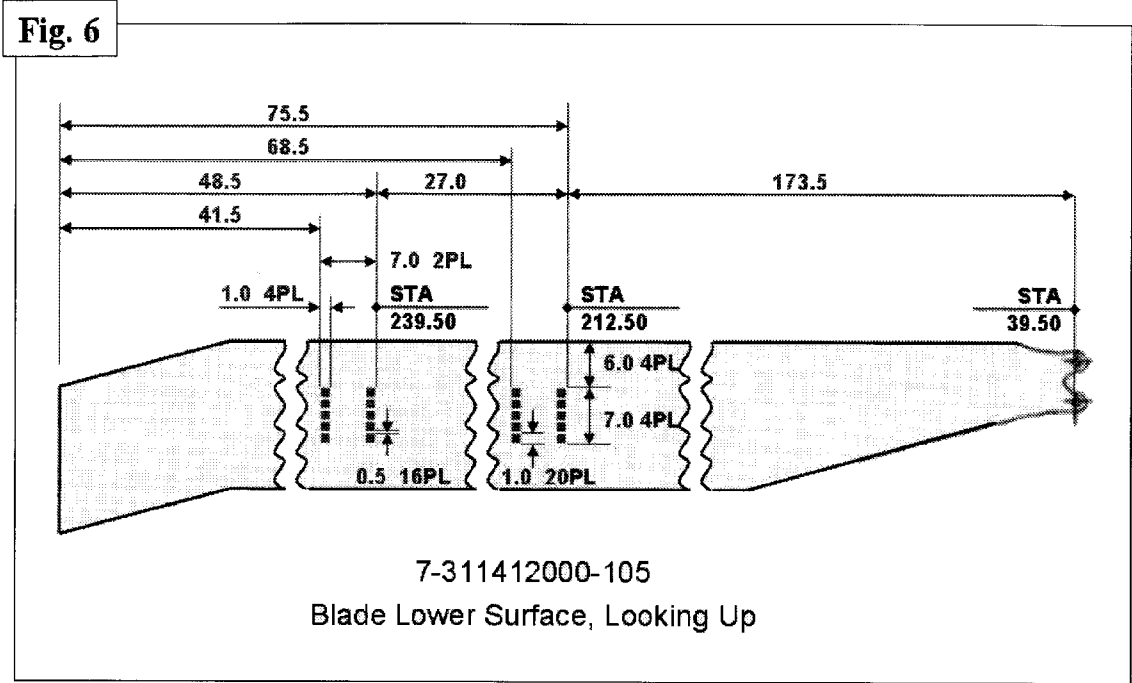


Fig. 3









**TB 1-1520-238-20-135**

**12. WEIGHT AND BALANCE DATA – N/A.**

**13. QUALITY ASSURANCE REQUIREMENTS –**

- 13.1 General quality assurance inspection criteria shall be in accordance with (MIL-Q-9858A).
- 13.2 Have installation inspected.
- 13.3 Ensure verification is properly recorded to show TB compliance (para 14).

**14. RECORDING AND REPORTING OF THE MODIFICATION –**

**NOTE**

Please report the TB completion to the LOG POC in paragraph 14.1.3.

**14.1 Records and Reports.**

14.1.1 The following forms are applicable and are to be completed in accordance with DA PAM 738-751, TAMMA-A.

14.1.1.1 Add entry on the DA Form 2408-13-1 that will remain on the aircraft forms and records until the aircraft is returned to original configuration. TB 1-1520-238-20-135 has been applied to the M/R head and blades. Any component changes to any of these parts must meet the requirements of the TB Para 10.16.

14.1.1.2 Add entry on the DA Form 2408-5-1 for each component (M/R Head and Blades) stating: TB 1-1520-238-20-135 has been applied; any component changes must meet the requirements of this TB.

14.1.1.3 Add entry on the DA Form 2408-15 stating: TB1-1520-238-20-135 has been applied to the M/R head and blades. Any component changes to any of these parts must meet the requirements of the TB.

14.1.2 Technical point of contact for this TB is: Mr. Eric Shull SAFE-AV-AAH-SA, DSN 897-4205 or commercial (256) 313-4205. Datafax is DSN 897-4374 or (256) 313-4374. E-mail is Eric.Shull@peoavn.redstone.army.mil.

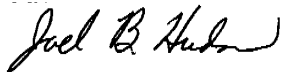
14.1.3 Logistical point of contact for this TB is: Mr. Mike Glazik SAFE-AV-AAH-LF, DSN 897-4065 or commercial (256) 313-4065. Datafax is DSN 897-4374 or (256) 313-4374. E-mail is Mike.glazik@peoavn.redstone.army.mil.

**15. NARRATIVE AND GRAPHIC DESCRIPTION OF TB. Not applicable**

**FOR THE COMMANDER:**

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

Official:



**JOEL B. HUDSON**  
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0413401

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To be distributed in accordance with initial distribution number (IDN) 314091, requirements for TB 1-1520-238-20-135.

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@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:** date time group
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.

