URGENT

***TB 1-1520-251-20-13**

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

REPLACEMENT OF FLANGE RING ON ELECTRICAL POWER – GENERATOR, A.C. FOR AH-64D HELICOPTERS

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

5 NOVEMBER 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 provide a process that removes the existing flange ring and replaces it with a new one of the same part number, however it is attached using seven rivets and H3151 Speedbonder Loctite.

2. PRIORITY. This TB is classified “URGENT”.

3. END ITEM. The following end items shall have the hardware and bonding jumpers installed in accordance with the instructions contained in Paragraph 10.

Part Number	Cage Code	Equipment Designator	Application	Serial Number
28B524-6A	64547	Generator, AC	AH-64D	N/A
28B524-8A	64547	Generator, AC	AH-64D	

4. PARTS AND MATERIAL.

4.1 Parts.

PART NUMBER	NOMENCLATURE	NATIONAL STOCK NUMBER	QUANTITY PER GENERATOR
1584747-1	Rivet		15 maximum
1591394-1	Flange Ring		1

4.2 Materials and Equipment.

DESCRIPTION	DETAILS	QUANTITY
Drill	Hand-held electric drill	1
Drill Bit	#42 (0.0938 + 0.000 / –0.0005 in.)	1
Drill Bit	5/32 inch, 11/64 inch, or 3/16 inch	1
Drill Stop	Adjustable device that secures to the drill bit for controlling maximum hole depth.	1
Countersink	Hand operated; ream style 90° cut angle with a T-handle holder or equivalent hand deburring tool	1
4252759-1	Index, clamping, drill fixture	1
Shim Tab	1/8 inch thick shim about 3/8 inch wide by 1 inch long	1
Hex Wrench	5/32 inch hex or allen wrench	1
Hammer	Ball peen hammer with a head weight of 8oz or less	1
Center punch	Rigid or spring loaded center punch	1
Pry bar	A sharp edged prying tool with a flat 3/16’ to 1/4’ wide face	1
File	Flat, fine serration metal file not longer than 10’	1
Pliers	Adjustable, locking pliers, Visegrip®	1
Scraper	Small X-acto® type scraper or equivalent	1
Abrasive sheet	Scotchbrite ® Type A very fine or #320 Grit sandpaper	**
Cleaning solvent	Isopropyl Alcohol or equivalent	**
Lint free wipes	Disposable paper type wipe cloth made from lint free materials	
Paper towels	Disposable general cleanup use paper wipe cloths	**
Cotton swabs	Disposable, lint free, cotton tipped swabs	**
Adhesive	Loctite H3151 (50 ml cartridge)	1
Dispenser	Loctite 50 ml manual dispenser PN 983531 or equivalent device	1
Plunger	Loctite plunger insert or equivalent to match adhesive cartridge (typically included with the dispenser)	1
Nozzle	Loctite disposable mixing nozzle PN 984569 or equivalent to match adhesive cartridge	1
Primer	Zinc chromate per TT-P-1757, Type 1, Class C or MIL-P-23377	**

Chemical film	Alodine 1200 or equivalent per MIL-C-5541 Class 1A conversion coating	**
Brush	Small, acid resistant brush	++
Water	Fresh, purified water suitable for clean rinsing	**
Rubber gloves	Latex or nitrile disposable elastic gloves	**
Marking labels	Adhesive marking labels or a suitable marking pen	**
Tape	Any self adhesive tape wide enough to cover each vent hole with a single strip	**
** - The quantity will vary with each application. Typically, a minimum package size quantity will be adequate for this process with an expected surplus.		
++ - The brush is not required if a brush or a suitable applicator is included with the chemical film solution.		

5. APPLICATIONS.

5.1 Level of Maintenace. AVIM

5.2 Time Required. N/A

5.3 Publication Change. TBD

6. REFERENCES. Interactive Electronic Technical Manual (IETM): TM 1-1520-251-Longbow/Apache IETM, CD No. 1, Version 3.1.2, Dated 29 May 02, CD Date 1 Dec 01 or subsequent.

7. INSPECTION – Visually inspect all rework as performed. Make sure that the holes drilled in the housing assembly conform to dimensions specified and all rivets must be even with the surface of the flange ring. No excess adhesive, primer, or metallic filing debris shall be present on the outer surfaces after assembly.

8. REMOVAL – Remove the AC generator from the aircraft in accordance with the TM 1-1520-251-Longbow/Apache Interactive Electronic Technical Manual (IETM) procedures.

9. PROCEDURES –

9.1 Put the unit on a stable work surface with the drive end (DE) oriented to allow access to the flange.

CAUTION

Use care, do not allow debris to get into generator unit.

9.2 Use self adhesive tape to seal closed the air exhaust vent holes located just below the flange. If tape does not bond to the generator do as follows:

9.2.1 Remove the adhesive tape.

9.2.2 Clean the area with general use disposable wipes and cleaning solvent.

9.2.3 Apply new tape to seal closed the air exhaust vent holes.

9.3 Clean any dirt, grease, and oil from the generator flange area with general use disposable wipes.

9.4 If the generator has an existing flange ring on it; use a center punch to dimple the center of each pin that holds the flange ring.

NOTE

If the flange ring is not attached with pins, go to step 6.

NOTE

If there is no flange ring on it, go to step 7.

9.5 Use a 5/32’ drill bit (or slightly larger) and gently drill off the top of each pin.

CAUTION

Do not drill out the pin. Remove only the peened section to allow the removal of the ring. Slight indentations in the pin to a depth below the flange edge surface are acceptable.

9.6 Remove the flange ring as follows:

9.6.1 Use a pry bar, start at the split and peel one end of the ring away from the flange.

9.6.2 Lever up the end until there is sufficient ring material loose to grip with locking pliers.

9.6.3 Adjust and tighten the pliers to the ring end and continue to peel the ring away from the flange.

NOTE

Earlier adhesives may peel away easily.

9.6.4 Completely remove the ring from the flange.

9.7 Use the hammer and gently peen and pins protruding above theflange edge surface.

9.8 File the pins off flush with the edge.

CAUTION

Do not over file the flange edge at any point, a flat spot in the otherwise curved surface may result.

9.9 Locate any previously drilled open holes (not filled with a pin).

9.10 Gently hammer a pin into each open hole.

9.11 Peen the pin into position.

9.12 File the pin flush with the edge.

CAUTION

Do not over file the flange edge at any point, a flat spot in the otherwise curved surface may result.

9.13 Use cleaning solvent and an abrasive sheet to remove all of residual adhesive from flange area and adjacent surfaces.

9.14 If not already done in the previous step, use the abrasive sheet and lightly abrade all of the flange edge surface on the generator housing.

9.15 Use the abrasive sheet and lightly abrade the internal diameter surface of the new flange ring.

9.16 Use lint free wipes and cleaning solvent to remove any abrasion dust and any other contaminant from the flange edge surface and the internal diameter surface.

9.17 Put on disposable latex or nitrile gloves.

9.18 Apply the chemical film conversion coating to all abraded areas of the generator housing.

9.19 Spread the chemical film conversion coating with the applicator or a small brush to all abraded areas.

9.20 Allow the solution to sit on the surfaces for a minimum of 3 minutes.

9.21 Thoroughly moisten several general use wipes with water and wipe all surfaces treated with the conversion coating.

9.22 Continue to wet wipe the areas until no residue is found on the cloths.

9.23 Dry wipe all the damp surfaces with the lint free wipes until all moisture is removed.

9.24 Properly dispose of all materials contaminated with the conversion solution.

9.25 Locate all previous pin locations and mark these with adhesive labels (or a marking pin) on the flange face near the edge. See Figure 1 and Figure 2.

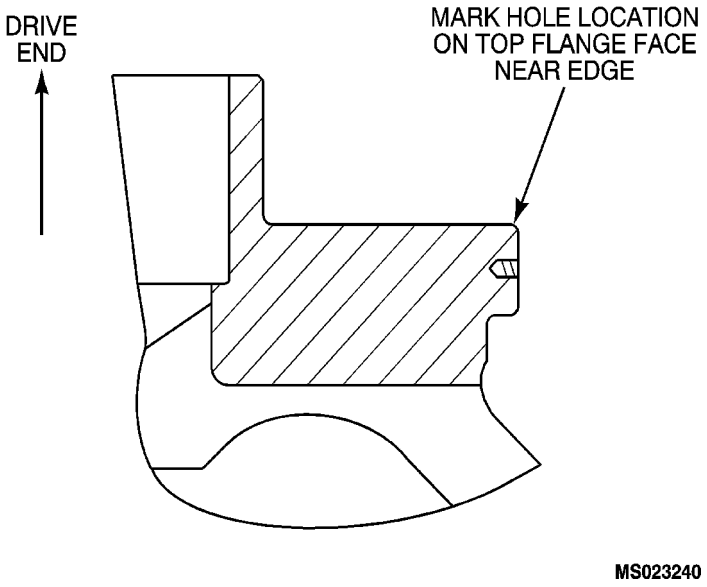

Figure 1. Generator Flanfe Cross-Section Through an Existing Filled Pin Hole.

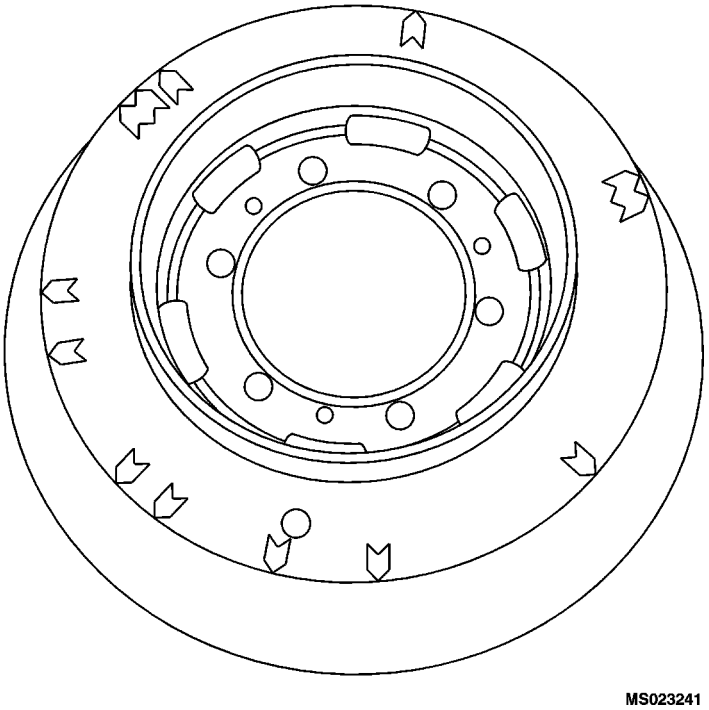

Figure 2. Adhesive Labels Marking Previous Pin Locations

9.26 Install the index, clamping, and drill fixture on the generator flange with the shim tab placed between the clamp faces at the latch.

9.27 Do not tighten the screws for the lower clamping plates.

9.28 Look at the index windows on the top face of the fixture.

9.29 Rotate the fixture and look for the labels or marks, put on during step 9.25, through the index windows.

9.30 Adjust the fixture location so that no labels (or marks) appear in any index window. See Figure 3 and Figure 4.

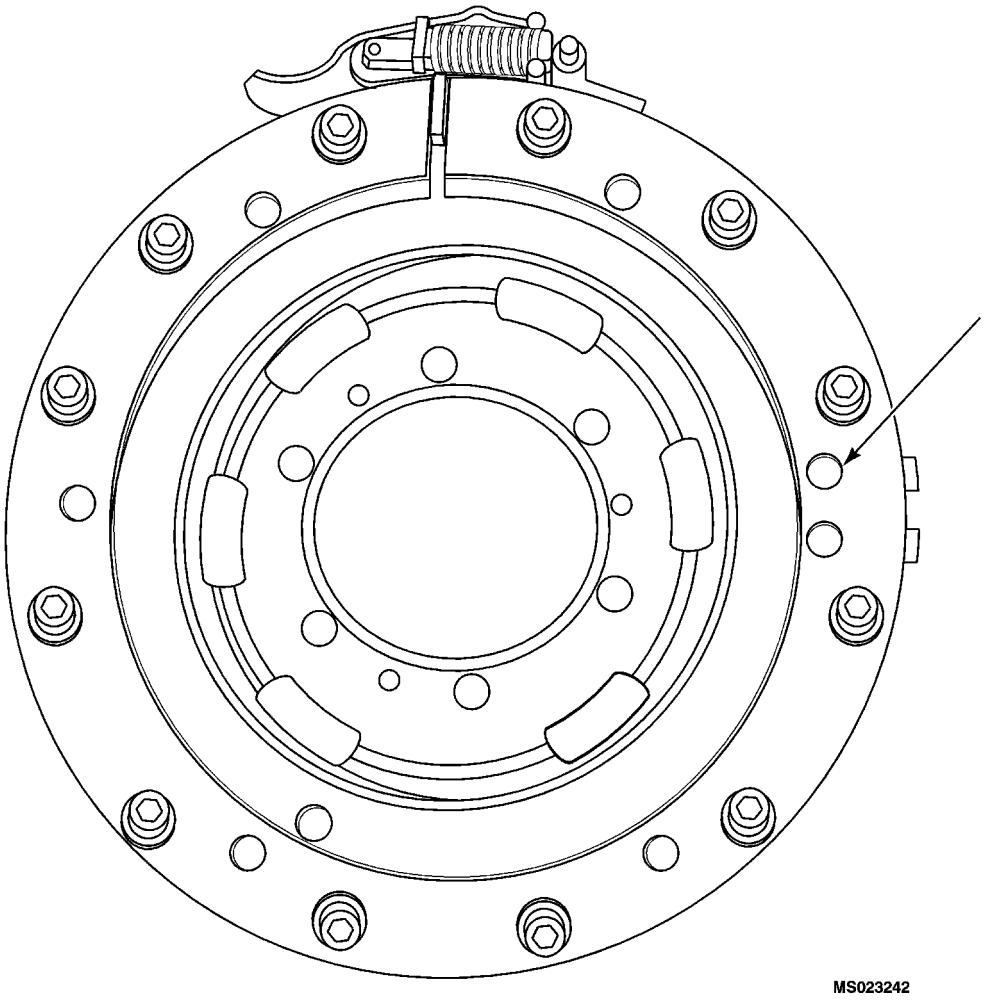

Figure 3. Label Visible Through the Index Window (Not Acceptable Orientation)

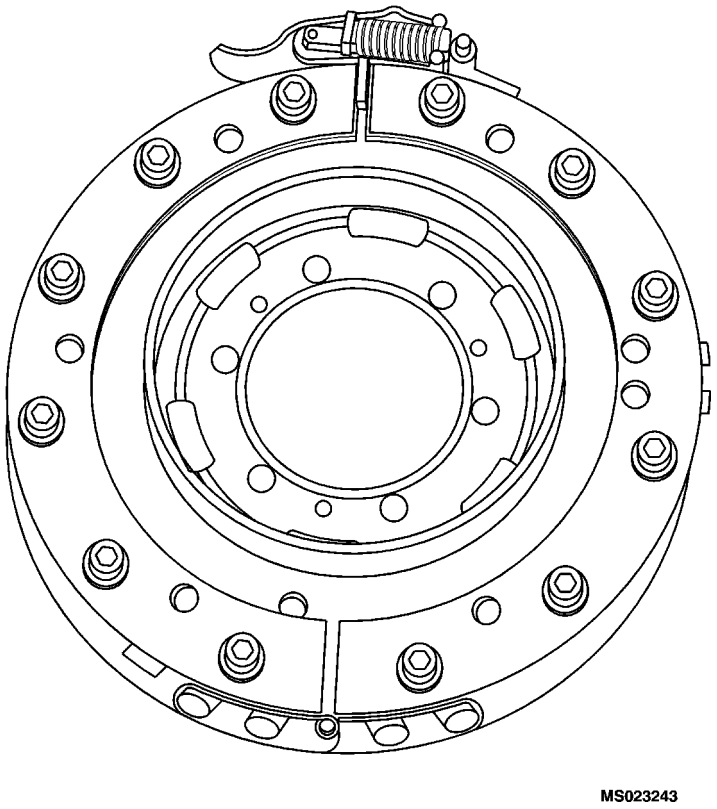

Figure 4. No Marks Visible Through Index Windows (Acceptable Orientation)

CAUTION

If no position is possible with the index window guideline, do not proceed with this repair and return generator to Honeywell for evaluation.

9.31 With the index, clamping, drill fixture in the desired position, mark the flange edge through the ring split view hole and at the index notch on the flange face.

9.32 Remove the fixture from the generator flange.

9.33 Remove any adhesive labels put on during step 9.25 because they may affect the clamping of the ring.

CAUTION

Do not remove the label or the mark put on to identify the ring split location.

9.34 Insert the proper plunger into the adhesive dispenser tool.

9.35 Assemble the adhesive cartridge into the dispenser.

9.36 Remove the protective cap at the cartridge discharge point.

9.37 Install a new, clean, mixing nozzle on the adhesive cartridge.

9.38 Advance the plunger to inject the adhesive product into the mixing nozzle.

9.39 Put a bead of the adhesive approximately 3/4” diameter and 3/8” thick on a lint free wipe. This will prevent the use of the part of the adhesive that may not ne properly mixed.

NOTE

The application and distribution of the adhesive should be completed in less than 10 minutes.

9.40 Start a thin bead of the adhesive near the top of the surface and apply around the full circumference of the generator flange edge.

9.41 Begin spreading the adhesive before any begins to drop off.

CAUTION

Use a lint free swab to spread the adhesive evenly over the entire flange edge surface. A swab should be discarded if the adhesive may drip off. Several swabs may be required to complete the task.

9.42 Additional adhesive is to be added to the flange edge to proved enough material to spread completely over the surface.

9.43 Use a fresh swab and spread a small amount of adhesive, evenly, on the bottom face of the generator flange.

9.44 Assemble the flange ring onto the generator flange edge with the lip put under the bottom flange face and the split aligned with the marks placed in step 9.25.

9.45 With hand pressure, work the ring into position and push out any excess adhesive from beneath the ring.

9.46 Wipe and remove the excess adhesive with the cotton swabs. Slight adhesive residue is acceptable.

9.47 Make sure the position of the ring split is aligned to the relevant marks and make sure that the ring has not slipped down on the flange edge.

9.48 Install the index, clamping, drill fixture over the flange ring.

9.49 Put the shim tab between the clamp faces at the fixture latch and tighten the latch.

9.50 Hand tighten the lower clamping plate holding screws in a star sequence until just snug. See Figure 5.

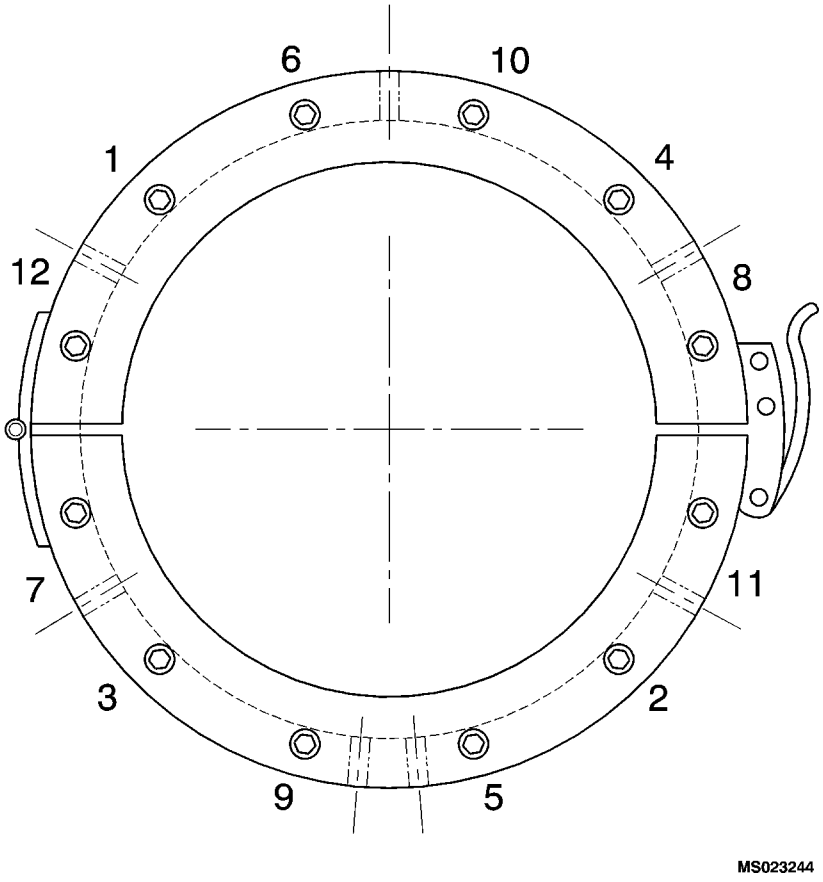

Figure 5. Bolt Tightening Pattern for the Lower Clamp Ring

9.51 Repeat the hand tightening sequence a few times until none of the twelve screws are loose.

9.52 Gently loosen the fixture latch.

9.53 Remove the shim tab.

9.54 Tighten the fixture latch.

9.55 Tighten the lower clamp plate holding screws with the hex wrench in the same sequence as in step 9.50. See Figure 5.

CAUTION

Only a gentle torque is required.

9.56 Repeat the tightening procedure until no screw is loose.

9.57 Make sure that the fixture top lip is in contact with the flange top face.

9.58 Look at the flange ring through the ring split view hole to make sure of the split position.

CAUTION

If the ring is not in the proper position, remove the fixture and repeat steps 9.44 through 9.58. The adhesive should still be workable.

CAUTION

If the ring position can not be shifted, peel the ring off the flange and repeat the entire repair procedure with a new ring.

9.59 Allow the fixture to remain clamped in place for 90 minutes. The adhesive will set within this period.

CAUTION

The adhesive will not reach full performance characteristics until the cure time has exceeded 24 hours.

9.60 After the 90 minutes set period has elapsed, insert a #42 drill bit, point first, into the depth gage block until the drill bit stops.

9.61 Slide the drill stop on the drill bit until it is flush against the gage block.

9.62 Tighten the drill stop to the bit.

9.63 Remove the bit from the gage block and make sure of the drill stop position as shown in Figure 6 and Table 1.

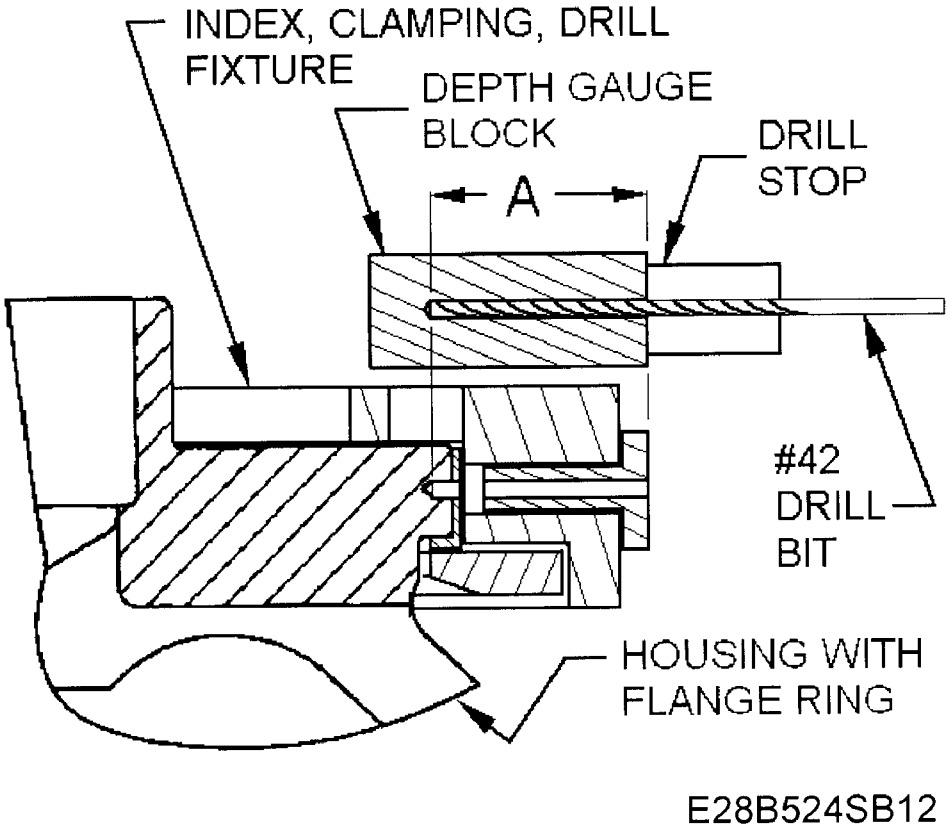

Table 1. Values of “A” for Drill Stop Depth Setting

Unit Outline	Max “A”	Min “A”
28B524	0.728	0.717

Figure 6. Depth Setting for Drill Stop (see Table 1 Values)

9.64 Install the #42 drill bit and the drill stop into the drill.

9.65 Drill seven holes in the flange ring and generator housing flange through the guide bushings in the index, clamping, drill fixture.

CAUTION

Use care to make sure the drill stop does not come loose or move out of position.

9.66 Loosen lower clamp plate holding screws of the index, clamping, drill fixture.

9.67 Remove the index, clamping, drill fixture from the generator.

CAUTION

Use care if any adhesive has bonded the fixture to the generator.

9.68 Work the one half of the fixture that does not cover the ring split first. Then slowly work back toward the ring split location.

9.69 Make sure that the fixture removal has not moved the ring.

9.70 After removing the fixture, remove any excess adhesive on the exterior surfaces of the flange ring and generator flange surfaces. A small scraper can be used to carefully remove cured or partially cured adhesive.

9.71 Use lint free wipes and cleaning solvent to remove any adhesive residue. Cured residue may require the use of an abrasive cloth saturated with cleaning solvent.

9.72 Use the hand held countersink tool and cut a 90° bevel in each of the seven drilled holes.

CAUTION

Use care not to cut below the ring thickness.

9.73 Coat each pin with primer and, while still wet, insert into each hole.

9.74 Gently tap each pin with the hammer to seat the pin in the hole.

9.75 Peen each pin to deform the material to fill the countersink.

9.76 Lightly file each pin until the material is flush with the flange ring.

9.77 Wipe away any filing dust and any excess primer from all surfaces.

9.78 Remove any adhesive labels, pen marks, etc.

9.79 Wipe all surfaces with lint free cloths and cleaning solvent.

9.80 Put conversion coat on the newly installed pins and touch up the conversion coating on all of the aluminum surfaces. See steps 9.17 through 9.24.

9.81 Remove the self-adhesive tape covering the air vent holes.

9.82 Clean away any tape residue with lint free cloths and cleaning solvent.

10. INSTALLATION Install the AC generator on the aircraft in accordance with the TM 1-1520-251-Longbow/Apache Interactive Electronic Technical Manual (IETM) procedures.

11. RECORDING AND REPORTING OF THE MODIFICATION –

11.1 Records and Reports.

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

11.1.1.1 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 1-1520-251-20-13 has been applied to the A.C. Generator.

11.1.1.2 Add entry on the DA Form 2408-5-1 stating that TB 1-1520-251-20-13 has been applied to A.C. Generator.

11.1.1.3 Add entry on the DA Form 2408-15 stating: TB 1-1520-251-20-13 has been applied to A.C. Generator.

11.1.2 Technical point of contact for this TB is: Mr. Hector Irizarry AMSRD-AMR-AE-D, DSN 897-9703 or commercial (256) 705-9703. Datafax is 256-705-9918. E-mail is hector.m.irizarry@us.army.mil.

11.1.3 Logistical point of contact for this TB is: Mr. William Wadlington SAFE-AV-AAH-LF, DSN 897-4103 or commercial (256) 313-4103. Datafax is DSN 897-4146 or (256) 313-4146. E-mail is william.wadlington@peoavn.redstone.army.mil.

By Order of the Secretary of the Army:

Official:

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

SANDRA R. RILEY
Administrative Assistant to the
Secretary of the Army
0428607

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@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:* 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: 081963-000