CDRAMCOM ST LOUIS MO//AMSAT-R-X//
AIG 8881
AIG 9004
AIG 9042
AIG 8708
AIG 7515
DCM APMO OZARK AL//DCMDS-RCQA//
ASF42 81ST ARCOM DOBBINS AFB GA
CDR4THBN228THAVN SOTO CANO HQ//AVN-AMO//
102DARMY SCOTT AFB IL//AFRC-AMO-ASF-IL//
AMEMBASSY ROME IT//ODC/PASS TO HQ MFO//
DIRAOD HOLLoman AFB NM//STEW-AA/GE/GS//
CDRAMCOM PICATINNY ARSENAL NJ//AMSMC-AV-D//
JOHNSON CONWORLDSVNCINC KWAJALEIN NO//PAR2//
USCS CNAC OKLAHOMA CITY OK//AMI//
USDOCO LANDSOUTHEAST IZMIR TU//AV//
DPRO BELL HELICOPTER FT WORTH TX//DCMDS-RBQ/
RBDF//
CDROSAC FT BELVOIR VA//ANAV-OS/ANAV-RW-M/ANAV-CR//
WALLOPS FLIGHT FACILITY NASA WALLOPS ISLAND VA
CF: AMSAT-W-AU, AMSAT-W-AA, AMSAT-R-ECH, AMSAT-R-EIH,
AMSAT-I-IAP, AMSAT-I-ILNO(RAAF), AMSAT-I-LOG(AOC)

BRAD MEYER, AEROSPACE ENGINEER
MINIMIZE CONSIDERED
AMSAT-R-X, X2085

NORBERT R. KNIEPP, X2178

UNCLASSIFIED

NOTE - THIS IS A SAFETY-OF-FLIGHT MESSAGE AND HAS NOT BEEN TRANSMITTED TO UNITS SUBORDINATE TO ADDRESSEES. ADDRESSEES SHOULD IMMEDIATELY RETRANSMIT THIS MESSAGE TO ALL SUBORDINATE UNITS, ACTIVITIES OR ELEMENTS AFFECTED OR CONCERNED. THE RETRANSMITTAL SHALL REFERENCE THE MESSAGE.


BRAD MEYER, AEROSPACE ENGINEER MINIMIZE CONSIDERED AMSAT-R-X, X2085

NORBERT R. KNIEPP, X2178
UNCLASSIFIED

UNSERVICEABLE (REPARABLE) TAG/LABEL DD FORM 1577-2/1577-3
(GREEN COLOR). ANNOTATE REMARKS BLOCK TO INDICATE THAT THE
ITEM IS UNSERVICEABLE IAW THIS MESSAGE (TB 1-1520-210-20-

(2) WHOLESALE STOCK - N/A.

2. TASK/INSPECTION SUSPENSE DATE - WITHIN NEXT 10 HOURS/14
DAYS.

3. REPORTING COMPLIANCE SUSPENSE DATE - NO LATER THAN 1
SEP 94 PER PARA 14A OF THIS MESSAGE.

NOTE
THE TERMS WORM GEAR AND WORM SCREW SHOULD
BE CONSIDERED SYNONYMOUS WHEN USED IN THIS
MESSAGE AND THE UH-1 MAINTENANCE AND PARTS
MANUALS.

4. SUMMARY OF PROBLEM -
A. THE WORM GEARS THAT ARE USED TO ADJUST THE TWIST ON
THE UH-1 MAIN ROTOR HUB TENSION TORSION STRAPS HAVE BEEN
FOUND LOOSE ON HUBS IN SERVICE AND IN STOCK. TO PREVENT
LOSS OF ADJUSTMENT OF THE TENSION TORSION STRAPS, THESE WORM
GEARS ARE SECURED IN PLACE BY MEANS OF PROPER SHIMMING OF
CF: AMSAT-W-AU, AMSAT-W-AA, AMSAT-R-ECH, AMSAT-R-EIH,
AMSAT-I-IAF, AMSAT-I-ILNO(RAAF), AMSAT-I-LOS(AOC)

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AMSAT-R-K, X2085

NORBERT R. KNIEPP, X2178
NO
THE HUB SPRING PLATE ASSEMBLY TO THE MAIN ROTOR YOKE. LOOSE
WORM GEARS MAY NOT BE NOTICEABLE BY THE CREW DURING
OPERATION OF AIRCRAFT WITH "HYDRAULICS ON"; HOWEVER, WITH
"HYDRAULICS OFF", SHOULD THE TENSION TORSION STRAP LOSE THE
PRESET ADJUSTMENT, A SIGNIFICANT LACK OF COLLECTIVE CONTROL
WILL BE NOTICED.

B. IN ADDITION TO LOOSE WORM GEARS, THE BOLTS THAT
MOUNT THE HUB SPRING PLATE ASSEMBLY TO THE MAIN ROTOR YOKE
WERE FOUND TO HAVE LOST TORQUE IN SOME OF THESE CASES.
LOOSE WORM GEARS AND LOST TORQUE ON THE MOUNTING BOLTS CAN
BE ATTRIBUTED TO EITHER IMPROPER SHIMMING OF THE HUB SPRING
PLATE (TOO MANY SHIMS), THE USE OF EXCESS ADHESIVE (EA934)
DURING ASSEMBLY OF THE PLATE TO THE YOKE, OR THE IMPROPER
APPLICATION OF THE ADHESIVE (WRONG LOCATION). THE
CORRECTION PROCEDURE IS THE SAME REGARDLESS OF THE CAUSE.
REMOVAL AND REINSTALLATION OF THE HUB SPRING PLATE ASSEMBLY
MUST BE ACCOMPLISHED PER THE INSTRUCTIONS IN THIS MESSAGE
AND IN TM 55-1520-210-23-1. AIRCRAFT ARE RESTRICTED FROM
"HYDRAULICS OFF" MANEUVERS, EXCEPT FOR EMERGENCY OPERATIONS,
UNTIL THE MAINTENANCE REQUIREMENTS OF THIS MESSAGE ARE

CF: AMSAT-W-AU, AMSAT-W-AA, AMSAT-R-ECH, AMSAT-R-EIH,
AMSAT-I-IAF, AMSAT-I-ILNO(RAAF), AMSAT-I-LOS(AOC)

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NO COMPLETED.

C. FOR MANPOWER/DOWNTIME AND FUNDING IMPACTS SEE PARA 12.

D. THE PURPOSE OF THIS MESSAGE IS TO:

(1) RESTRICT AIRCRAFT FROM "HYDRAULICS OFF" MANEUVERS, EXCEPT FOR EMERGENCY OPERATIONS, UNTIL THE MAINTENANCE REQUIREMENTS OF PARAGRAPH 8 AND 9 ARE COMPLETED.

(2) REQUIRE A ONE TIME INSPECTION OF UH-1H/V AIRCRAFT FOR LOOSE WORM GEARS AND/OR LOOSE HUB SPRING PLATE MOUNTING BOLTS AND TO MAKE CORRECTIVE ACTION AS NECESSARY.

5. END ITEMS TO BE INSPECTED - ALL UH-1H/V AIRCRAFT.

6. ASSEMBLY COMPONENTS TO BE INSPECTED

<table>
<thead>
<tr>
<th>NOMENCLATURE</th>
<th>PART NO.</th>
<th>NSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>HUB ASSEMBLY</td>
<td>204-012-101-137</td>
<td>1615-01-261-0570</td>
</tr>
<tr>
<td>HUB ASSEMBLY</td>
<td>204-012-101-141</td>
<td>1615-01-270-2982</td>
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</tbody>
</table>

7. PARTS TO BE INSPECTED -

<table>
<thead>
<tr>
<th>NOMENCLATURE</th>
<th>PART NO.</th>
<th>NSN</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLATE ASSEMBLY</td>
<td>204-011-207-105</td>
<td>5340-01-286-0636</td>
</tr>
<tr>
<td>WORM GEAR</td>
<td>204-012-109-1</td>
<td>3020-01-318-6284</td>
</tr>
<tr>
<td>MACHINE BOLT</td>
<td>MS21250H06006</td>
<td>5306-00-975-2073</td>
</tr>
</tbody>
</table>


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AMSAT-R-X, X2085

NORBERT R. KNIEPP, X2178
8. Inspection Procedures -

A. Aircraft are restricted from "hydraulics off" maneuvers, except for emergency operations, until the maintenance requirements of paragraph 8 and 9 are completed.

Note

Inspection procedures can be performed while the main rotor hub is installed on the aircraft. Correction procedures require removal of the main rotor hub from the aircraft.

B. Remove rubber springs, item 58, figure 128, TM 55-1520-210-23-P1, from their mounts to gain access to hub spring plate on bottom of main rotor hub.

C. Using a 3/8 inch wrench, apply a slight force of about 15 inch pounds to each of the two worm gears on the plate assembly. If either worm gear turns when force is applied they should be considered loose. If loose, proceed to the corrective procedures of paragraph 9.

D. Cut and remove lockwire on the four hub spring.

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NO

PLATE MOUNTING BOLTS. USING A TORQUE WRENCH SET AT 180 INCH POUNDS, ATTEMPT TO TURN EACH BOLT. IF ANY ONE BOLT TURNS PRIOR TO ACHIEVING 180 INCH POUNDS, CORRECTIVE ACTION IS REQUIRED PER PARAGRAPH 9.

E. IF THE WORM GEAR DOES NOT TURN AND THE HUB SPRING PLATE ATTACHMENT BOLTS HAVE NOT LOST TORQUE, THE MAINTENANCE REQUIREMENTS OF THIS MESSAGE ARE COMPLETE. RE-LOCKWIRE THE ATTACHMENT BOLTS. REINSTALL RUBBER SPRINGS.

9. CORRECTION PROCEDURES

NOTE

MARK POSITION OF INBOARD TT-STRAP FITTINGS PRIOR TO REMOVING HUB SPRING PLATE.

A. USING A GREASE PENCIL OR MARKER WRITE THE WORDS "RED" AND "WHITE" ON THE ENDS OF THE PLATE ASSEMBLY CORRESPONDING TO THE RED AND WHITE ENDS OF THE HUB ASSEMBLY.

CUT LOCK WIRE AND REMOVE FOUR BOLTS HOLDING PLATE ASSEMBLY TO MAIN ROTOR YOKE. REMOVE PLATE ASSEMBLY. CAREFULLY REMOVE SHIMS. SHIMS MAY BE RE-USED IF THEY ARE NOT DAMAGED DURING REMOVAL.

B. INSPECT ADHESIVE ADHERED TO THE PLATE ASSEMBLY. IF


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THE ADHESIVE IS CRACKED OR SHOWS EVIDENCE OF DEBONDING. PROCEED TO PARAGRAPH 9D. ADHESIVE SHOULD NOT, REPEAT, SHOULD NOT SHOW EVIDENCE OF HAVING FLOWED ONTO THE HORIZONTAL SURFACE OF THE PLATE ASSEMBLY ON WHICH THE SHIMS ARE INSTALLED. THE ADHESIVE SHOULD ONLY BE LOCATED ON THE VERTICAL SURFACE OF THE WORM SCREW BRACE. IF THE ADHESIVE IS CORRECTLY INSTALLED (ON THE VERTICAL SURFACE ONLY) AND DOES NOT SHOW EVIDENCE OF CRACKING OR DEBONDING, PROCEED TO PARAGRAPH 9F.

NOTE
CARE SHOULD BE TAKEN NOT TO DAMAGE THE PLATE ASSEMBLY DURING REMOVAL OF THE OLD ADHESIVE. DAMAGED PLATE ASSEMBLIES IN EXCESS OF REPAIRABLE LIMITS ALLOWED IN TM 55-1520-210-23-1, FIGURE 5-19.3, ARE CONSIDERED UNSERVICEABLE.


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ADHERED TO THE HORIZONTAL SURFACE ONLY. DO NOT DISTURB OR
DAMAGE THE ADHESIVE ON THE VERTICAL SURFACE. IF THE
ADHESIVE ON THE VERTICAL SURFACE IS DAMAGED OR CRACKED THEN
IT MUST ALSO BE REMOVED. IF THE ADHESIVE FROM THE
HORIZONTAL SURFACE IS REMOVED SUCCESSFULLY, PROCEED TO
PARAGRAPH 9F.

D. REMOVE ALL ADHESIVE FROM THE PLATE ASSEMBLY. CLEAN
SURFACES OF THE YOKE AND THE PLATE ASSEMBLY THOROUGHLY.

E. REINSTALL THE PLATE ASSEMBLY USING THE PROCEDURES
FOR INSTALLING "NEW" PLATE ASSEMBLIES IN TM 55-1520-210-23-
1, PARAGRAPH 5-22.F.1. MODIFIED AS FOLLOWS:

NOTE
STOPS (14.1) AND KEYS (10.1) DO NOT HAVE
TO BE INSTALLED WHILE DETERMINING SHIM
THICKNESS.

(1) HANDTIGHTEN BOLTS (13.1) IN PLATE ASSEMBLY
(11.1) MAKING SURE WORM SCREW BOTTOMS OUT ON INBOARD TT-
STRAP FITTING RACK. USE A SMALL TORQUE WRENCH AND GRADUALLY
TIGHTEN BOLTS IN A CRISS CROSS ("X" PATTERN) TO 10 INCH
POUNDS. USING A FEELER GAGE AT EACH BOLT LOCATION, MEASURE

CF: AMSAT-W-AU, AMSAT-W-AA, AMSAT-R-ECH, AMSAT-R-EIH,
AMSAT-I-IAF, AMSAT-I-ILNO(RAAF), AMSAT-I-LOS(AOC)

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AMSAT-R-X, X2085

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THE GAP BETWEEN THE YOKE (7) AND THE PLATE ASSEMBLY. RECORD EACH MEASUREMENT BEING CAREFUL TO KEEP THE MEASUREMENTS FOR THE RED AND WHITE ENDS SEPARATE. REMOVE PLATE ASSEMBLY.

NOTE
GAP MEASUREMENT BETWEEN YOKE AND PLATE ASSEMBLY MAY NOT BE EQUAL END-TO-END AND SIDE-TO-SIDE. PROPER SHIMMING OF THE PLATE ASSEMBLY REQUIRES SHIMS FOR THE RED AND WHITE ENDS TO BE CALCULATED SEPARATELY. THIS COULD RESULT IN A DIFFERENT SHIM THICKNESS BETWEEN THE RED AND WHITE ENDS. THIS DIFFERENCE SHOULD NOT APPRECIABLY EFFECT MAIN ROTOR HUB BALANCE.

(2) TAKE THE MEASUREMENTS FOR THE RED END AND AVERAGE THE TWO MEASUREMENTS. USING THIS AVERAGE, SUBTRACT 0.008 TO 0.012 INCH. PEEL SHIMS TO THIS THICKNESS. THIS WILL PROVIDE THE REQUIRED 0.008 TO 0.012 INCH PINCH FIT ON THE RED END. REPEAT THIS PROCEDURE FOR THE WHITE END.

(3) POSITION STOPS (14.1) AS SHOWN IN FIGURE 5-12.


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NORBERT R. KNIEPP, X2178
WARNING

BE CAREFUL NOT TO APPLY AN EXCESSIVE
AMOUNT OF ADHESIVE TO PLATE ASSEMBLY.
TOO MUCH ADHESIVE CAN RESULT IN IMPROPER
SHIMMING AND LOOSE WORM GEARS.

(A) APPLY A THIN, EVEN LAYER OF ADHESIVE
(C29) (APPROXIMATELY 1/16 TO 1/8 INCH THICK) JUST ABOVE THE
RADIUS ON THE VERTICAL SURFACE ALONG THE LENGTH OF THE WORM
SCREW BRACE. TYPICAL TWO PLACES.

(B) POSITION SHIMS (15.1) ON PLATE ASSEMBLY.
TYPICAL TWO PLACES.

(B.1) APPLY A THIN FILM OF MOLD COMPOUND
(C80.1 OR C80.2) TO MAIN ROTOR YOKE ADJACENT TO THE LOCATION
OF THE WORM SCREW SUPPORTS, SO ADHESIVE DOES NOT BOND TO THE
MAIN ROTOR YOKE.

(C) WHILE ADHESIVE IS STILL WET, INSTALL
PLATE ASSEMBLY TO YOKE WITH BOLTS (13.1) AND WASHERS (12.1)
BEING CAREFUL NOT TO GET WET ADHESIVE ON BOTTOM OF YOKE.
HANDBIGHTEN BOLTS (B.1).

NOTE

CF: AMSAT-W-AU, AMSAT-W-AA, AMSAT-R-ECH, AMSAT-R-EIH,
AMSAT-I-IAF, AMSAT-I-ILNO(RAAF), AMSAT-I-LOS(AOC)

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AMSAT-R-X, X2085

NORBERT R. KNEIPP, X2178

UNCLASSIFIED 151829ZAUG94
CHECK THAT WORM GEARS ARE ENGAGED WITH
INBOARD TT-STRAP FITTING ON RACK. CHECK
POSITION OF INBOARD TT-STRAP FITTINGS.
READJUST TO ORIGINAL POSITION IF NECESSARY.

(D) TORQUE BOLTS (13.1) IN AN "X" PATTERN
180 TO 210 INCH POUNDS AND SECURE WITH LOCKWIRE.

NOTE
TORQUE SHALL BE RECHECKED AFTER 5 TO 10
HOURS OF OPERATION.

(E) ALLOW ADHESIVE (C29) TO CURE 24 HOURS AT
ROOM TEMPERATURE.

WARNING
PLATE ASSEMBLY MUST BE RETURNED TO ORIGINAL
POSITION (RED END TO RED END AND WHITE END
TO WHITE END) OR BINDING OF THE WORM GEAR
AND INSTALLATION BOLTS IS POSSIBLE.

F. FOR PLATE ASSEMBLIES WHICH DO NOT REQUIRE
APPLICATION OF NEW ADHESIVE, DETERMINE SHIM REQUIREMENT PER
PARAGRAPH 9E(1) AND 9E(2) AND INSTALL PLATE ASSEMBLY PER TM
55-1520-210-23-1, PARAGRAPH 5-22.F.

CF: AMSAT-W-AU, AMSAT-W-AA, AMSAT-R-ECH, AMSAT-R-EIH,
AMSAT-I-IAF, AMSAT-I-ILNO(RAAF), AMSAT-I-LOS(AOC)

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