

UNCLASSIFIED

01 19 151829Z AUG 94 OO PP UUUU AA ZYUW

NO

CDRATCOM 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 HO//AVN-AMO//

102DARMY SCOTT AFB IL//AFRC-AMO-ASF-IL//

AMEMBASSY ROME IT//ODC/PASS TO HQ MFO//

DIRAAOD HOLLOMAN AFB NM//STEWS-AA/GE/GS//

CDRAMCCOM PICATINNY ARSENAL NJ//AMSMC-AV-D//

JOHNSON CONWORLDSVCINC KWAJALEIN NQ//PAR2//

USCS CNAC OKLAHOMA CITY OK//AMI//

USDOCO LANDSOUTHEAST IZMIR TU//AV//

DPRO BELL HELICOPTER FORT 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-IAF, AMSAT-I-ILNO(RAAF), AMSAT-I-LOS(AOC)

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

NORBERT R. KNIOPP, X2178

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151829ZAUG94

*UH-1-9404  
m/r head  
inboard fittings  
worm gear*

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NO

XMT USDAO DHAKA BG

USDAO RANGOON BM

USDAO COLOMBO CE

USDAO SUVA FJ

DSA NEW DELHI IN

USDAO ROME IT

USDAO ANTANANARIVO MA

CDRATCOM ST LOUIS MO//AMSAT-R-X//

SAO KUALA LUMPUR MY

USDAO KATHMANDU NP//SAO//

UNCLAS

SUBJECT - SAFETY-OF-FLIGHT MESSAGE, TECHNICAL, RCS CSGLD-1860(R1), ALL UH-1H/V AIRCRAFT, RESTRICTION OF "HYDRAULICS OFF" MANEUVERS AND ONE TIME INSPECTION FOR LOOSE MAIN ROTOR HUB WORM GEARS, (UH-1-94-04) (TB 1-1520-210-20-25)

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.

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

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 1-1520-210-20-25). DISCREPANT ITEMS WILL BE CORRECTED IAW PARAGRAPH 9.

(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

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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

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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

NOMENCLATURE	PART NO.	NSN
HUB ASSEMBLY	204-012-101-137	1615-01-261-0570
HUB ASSEMBLY	204-012-101-141	1615-01-270-2982

7. PARTS TO BE INSPECTED -

NOMENCLATURE	PART NO.	NSN
PLATE ASSEMBLY	204-011-207-105	5340-01-286-0636
WORM GEAR	204-012-109-1	3020-01-318-6284
MACHINE BOLT	MS21250H06006	5306-00-975-2073

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AMSAT-I-IAP, AMSAT-I-ILNO(RAAF), AMSAT-I-LOS(AOC)

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SHIMS 204-011-213-101 5365-01-287-5352

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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NO

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.

C. PLATE ASSEMBLIES WITH ADHESIVE WHICH HAS FLOWED  
ONTO THE HORIZONTAL SURFACE CAN BE REINSTALLED WITHOUT  
TOTALLY REMOVING THE OLD ADHESIVE IF THE FOLLOWING PROCEDURE  
IS SUCCESSFULLY ACCOMPLISHED: CAREFULLY REMOVE THE ADHESIVE

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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.P.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

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NO

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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NO

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.  
HANDTIGHTEN BOLTS (B.1).

NOTE

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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.

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