CAL DEPT OF FORESTRY AVIATION
3460 BUSINESS DR SUITE 150
SACRAMENTO CA 95818

1 RUCIFRS5427 190602 DA=BDCVXBA
R 172030Z JUL 90 ZEX
FH CDR AVSCOM ST LOUIS MO /AMS=AVSOF//
TO NUCLRFA/ CALIFORNIA DEPARTMENT OF FORESTRY AVIATION 3460 //
BIZINESS DR SUITE 150 SACRAMENTO CA 95818//
DA=BDCVXBA
UNCLAS
SUBJECT - AVIATION SAFETY MESSAGE, UH-1H/V AND EH-1H/X AIRCRAFT,
COLD WEATHER USE OF HUB MOMENT SPRING AND HUB RESTRAINT (HUB SPRING)
(UHM=190Z=ASH=O6).
NOTE - THIS MESSAGE IS NOT A SAFETY OF FLIGHT MESSAGE. THIS IS AN
AVIATION SAFETY MESSAGE AND HAS NOT BEEN TRANSMITTED TO UNITS
SUBORDINATE TO ADDRESSES. REQUEST ADDRESSES RETRANSMIT THIS
MESSAGE TO ALL SUBORDINATE UNITS, ACTIVITIES OR ELEMENTS AFFECTED OR
PAGE 02 RUCIFRS5427 UNCLAS
CONCERNED, THE RETRANSMITTAL SHALL REFERENCE THIS MESSAGE.
A. REFERENCES -
(1) MWD 55-1520-242-50-1, HUB MOMENT SPRING AND HUB RESTRAINT
RETROFIT KIT, DTD 29 JAN 88 THRU CHANGE 4, DTD 19 JUN 89.
(2) AVSCOM 132100Z NOV 89 MESSAGE, SUBJECT = SAFETY OF FLIGHT
MESSAGE, OPERATIONAL, RCS CSGLD-1860(R1) UH-1H/V AND EH-1H/X
AIRCRAFT, COLD WEATHER USE OF HUB MOMENT SPRING AND HUB RESTRAINT
(HUB SPRING) (UHM=190Z=ASH=O6) (TB 55-1520-242-50-4A),
1. PURPOSE - THE PURPOSE OF THIS MESSAGE IS TO CLARIFY THE NEED FOR
THE HUB MOMENT SPRING AND HUB RESTRAINT ON THE UH-1 AIRCRAFT AND TO
REITERATE THE NEED FOR REMOVAL OF THE ELASTOMERIC SPRINGS IN COLD
WEATHER.
2. THE REFERENCED MODIFICATION WORK ORDER, MWD 55-1520-242-50-1,
INSTALLED THE HUB MOMENT SPRING AND HUB RESTRAINT RETROFIT KIT ON
THE UH-1H/V AND EH-1H/X AIRCRAFT. THE HUB SPRING WAS DEVELOPED IN AN
EFFORT TO REDUCE OR ELIMINATE THE CONDITION KNOWN AS MAST
BUMPING. IN ADDITION TO THE HUB SPRING, CHANGES TO THE OPERATOR'S
MANUAL TO BETTER DEFINE THE CONDITIONS LEADING TO MAST BUMPING,
DEVELOPMENT OF A MAST BUMPING TRAINING VIDEO THAT WAS WIDELY
DISTRIBUTED, AND INCREASED EMPHASIS ON MAST BUMPING AWARENESS DURING
PAGE 03 RUCIFRS5427 UNCLAS
PILOT TRAINING HAVE CONTRIBUTED TO THE REDUCTION OF MAST BUMPING
INCIDENTS.
3. THE HUB SPRING UTILIZES ELASTOMERIC (RUBBER) SPRINGS WHICH
CHANGED THE SOLID METAL TO METAL IMPACT AT A MAXIMUM HUB FLAPPING

TO REPLY BY MAILGRAM MESSAGE. SEE REVERSE SIDE FOR WESTERN UNION'S TOLL-FREE PHONE NUMBERS
ANGLE (APPROXIMATELY ELEVEN DEGREES) TO A GRADUALLY INCREASING.
CUSHIONED IMPACT AS FLAPPING ANGLES INCREASE, A TWO (2) PER REV.
VIBRATION WILL OCCUR AND WILL INCREASE IN INTENSITY AS THE FLAPPING
ANGLE INCREASES AND THE RUBBER SPRING IS COMPRESSED. THE INCREASE
IN FEEDBACK INTENSITY WILL INDICATE THE NEED TO REDUCE THE SEVERITY
OF THE MANEUVER.

4. AN UNDESIRABLE SIDE EFFECT OF THE HUB SPRING HAS BEEN THE
INTRODUCTION OF A NEW LOAD TO THE MAST THICKNESS. THIS HAS DECREASED THE LIFE
OF THE MAST FROM UNLIMITED TO 1500 HOURS. AS OUTSIDE AIR
TEMPERATURE DECREASES, THE RUBBER SPRINGS BECOME STIFFER, THEREBY
INCREASING THE LOAD ON THE MAST. WHEN THE TEMPERATURE FALLS BELOW
ZERO DEGREES FAHRENHEIT THE FATIGUE LIFE OF THE MAST IS DECREASED.
EVEN FURTHER, THE COLDER THE TEMPERATURE, THE GREATER THE DECREASE
IN LIFE. AT TEMPERATURES OF AROUND FORTY BELOW ZERO THE RUBBER
SPRING BECOMES SO HARD THAT IMPACT AT EVEN LOW FLAPPING ANGLES (I.E.,
FIVE DEGREES) CAN RESULT IN STRUCTURAL DAMAGE TO THE MAST.

PAGE 04 RUCIFRSD5427 UNCLASS.
OPERATION AT ANY TEMPERATURE BELOW ZERO FAHRENHEIT IS UNACCEPTABLE.
REMOVAL OF THE RUBBER SPRINGS WHEN A TEMPERATURE BELOW ZERO DEGREES
IS ANTICIPATED IS ESSENTIAL TO ASSURE SAFE OPERATION FOR THE FULL
1500 HOUR LIFE. THE RUBBER SPRINGS SHOULD BE REINSTALLED WHEN THE
THREAT OF BELOW ZERO DEGREE TEMPERATURES IS PAST.

NOTE
WHEN REMOVING THE RUBBER SPRINGS DUE TO COLD TEMPERATURES,
REMOVE ONLY THE RUBBER SPRINGS AND THE ATTACHMENT BOLTS.
DO NOT REMOVE THE HUB SPRING MOUNTS FROM THE MAST.

5. WHEN THE RUBBER SPRINGS ARE REMOVED FROM THE AIRCRAFT ALL
MECHANICAL PROTECTION AGAINST MAST BUMPING IS GONE. WHEN OPERATING
THE AIRCRAFT UNDER THIS CONDITION, EXTREME CARE SHOULD BE TAKEN TO
OPERATE WITHIN THE OPERATOR'S MANUAL GUIDANCE AND WITHIN THE
PRESCRIBED FLIGHT ENVELOPE. IT SHOULD ALSO BE NOTED, THAT WITH THE
RUBBER SPRINGS REMOVED THE CREW WILL NOTICE METAL TO METAL CONTACT
OF THE HUB AND MAST DURING RUN-UP AND COAST-DOWN. ESPECIALLY DURING
WINDY CONDITIONS (WHERE LIMITATIONS ARE SPECIFIED IN THE
MANUAL), THIS IS NORMAL AND ALSO OCCURRED PRIOR TO INSTALLATION
OF THE HUB SPRING MECHANICAL PROTECTION AGAINST MAST BUMPING.
WHEN THE RUBBER SPRINGS ARE REMOVED DUE TO COLD WEATHER, THE GUIDANCE GIVEN IN PARA 5 ABOVE WILL
ASSURE SAFE OPERATION.

6. POINTS OF CONTACT
A. TECHNICAL POINT OF CONTACT FOR THIS MESSAGE IS MR. FRED
KERSHAW, AMSAV/ECH, DSN/AUTOVON 693-1683 OR COMMERCIAL 314/263-1683.
B. MESSAGE POINT OF CONTACT IS MR. DON C. NGUYEN, AMSAV/SHOF,
DSN/AUTOVON 693-9089 OR COMMERCIAL 314/263-9089.
C. FOREIGN MILITARY SALES (FMS) RECIPIENTS REQUIRING
USDA FOREST SERVICE AVIATION FIRE MGMT
3905 VISTA AVE
BOISE ID 83705

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R 172030Z JUL 90 ZEK
PM CDR AVSCOM ST LOUIS MO //AMS//
TO RUCIFRA/USDA FOREST SERVICE AVIATION FIRE MGMT
//3905 VISTA AVE BOISE ID 83705//
DA-BDCFVA
UNCLASS
SUBJECT - AVIATION SAFETY MESSAGE, UH-1H/V AND EH-1H/X AIRCRAFT.
COLD WEATHER USE OF HUB MOMENT SPRING AND HUB RESTRAINT (HUB SPRING)
(UH-1-90-ASM-08).

NOTE - THIS MESSAGE IS NOT A SAFETY OF FLIGHT MESSAGE. THIS IS AN
AVIATION SAFETY MESSAGE AND HAS NOT BEEN TRANSMITTED TO UNITS
SUBORDINATE TO ADDRESSEES. REQUEST ADDRESSEES RETRANSMIT THIS
MESSAGE TO ALL SUBORDINATE UNITS. ACTIVITIES OR ELEMENTS AFFECTED OR
PAGE 02 RUCIF95427 UNCLASS
CONCERNED, THE RETRANSMITTAL SHALL REFERENCE THIS MESSAGE.
A. REFERENCES -
   (1) MWO 55-1520-242-50-1. HUB MOMENT SPRING AND HUB RESTRAINT
       RETROFIT KIT. DID 29 JAN 88 THRU CHANGE 4. DTD 19 JUN 89.
   (2) AVSCOM 1381002 NOV BY MESSAGE, SUBJECT - SAFETY-OF-FLIGHT
       MESSAGE, OPERATIONAL, RCS CSLO-18601R1: UH-1H/V AND EH-1H/X
       AIRCRAFT, COLD WEATHER USE OF HUB MOMENT SPRING AND HUB RESTRAINT

1. PURPOSE - THE PURPOSE OF THIS MESSAGE IS TO CLARIFY THE NEED
   FOR THE HUB MOMENT SPRING AND HUB RESTRAINT ON THE UH-1 AIRCRAFT AND TO
   REITERATE THE NEED FOR REMOVAL OF THE ELASTOMERIC SPRINGS IN COLD
   WEATHER.

2. THE REFERENCED MODIFICATION WORK ORDER, MWO 55-1520-242-50-1,
   INSTALLED THE HUB MOMENT SPRING AND HUB RESTRAINT RETROFIT KIT ON
   THE UH-1H/V AND EH-1H/X AIRCRAFT. THE HUB SPRING WAS DEVELOPED IN
   AN EFFORT TO REDUCE OR ELIMINATE THE CONDITION KNOWN AS MAST
   BUMPING. IN ADDITION TO THE HUB SPRING, CHANGES TO THE OPERATOR'S
   MANUAL TO BETTER DEFINE THE CONDITIONS LEADING TO MAST BUMPING,
   DEVELOPMENT OF A MAST BUMPING TRAINING VIDEO THAT WAS WIDELY
   DISTRIBUTED, AND INCREASED EMPHASIS ON MAST BUMPING AWARENESS DURING
   PAGE 03 RUCIF95427 UNCLASS
   PILOT TRAINING HAVE CONTRIBUTED TO THE REDUCTION OF MAST BUMPING
   INCIDENTS.

3. THE HUB SPRING UTILIZES ELASTOMERIC (RUBBER) SPRINGS WHICH
   CHANGED THE SOLID METAL TO METAL IMPACT AT A MAXIMUM HUB FLAPPING
ANGULAR (APPROXIMATELY ELEVEN DEGREES) TO A GRADUALLY INCREASING,
CUSHIONED IMPACT AS FLAPPING ANGLES INCREASE. A TWO (2) PER REV
VIBRATION WILL OCCUR AND WILL INCREASE IN INTENSITY AS THE FLAPPING
ANGLE INCREASES AND THE RUBBER SPRINGS IS COMPRESSED. THE INCREASE
IN FEEDBACK INTENSITY WILL INDICATE THE NEED TO REDUCE THE SEVERITY
OF THE MANEUVER.

4. AN UNDESIRABLE SIDE EFFECT OF THE HUB SPINDLE HAS BEEN THE
INTRODUCTION OF A NEW LOAD TO THE MAST WHICH HAS DECREASED THE LIFE
OF THE MAST FROM INDEFINITE TO 1250 HOURS. AS OUTSIDE AIR
TEMPERATURE DECREASES, THE RUBBER SPRINGS BECOME STIFFER, ILLUSTRATED
INCREASED LOAD ON THE MAST. WHEN THE TEMPERATURE FALLS BELOW
ZERO DEGREES FAHRENHEIT THE FATIGUE LIFE OF THE MAST IS DECREASED
FURTHER. THE COLDER THE TEMPERATURE, THE GREATER THE DECREASE
IN LIFE. AT TEMPERATURES OF AROUND FORTY BELOW ZERO THE RUBBER
SPRING BECOMES SO HARD THAT IMPACT AT EVEN LOW FLAPPING ANGLES (I.E.
FIVE DEGREES) CAN RESULT IN STRUCTURAL DAMAGE TO THE MAST.

NOTE: REMOVAL OF THE RUBBER SPRINGS AT ANY TEMPERATURE BELOW ZERO FAHRENHEIT IS UNACCEPTABLE.
REMOVAL OF THE RUBBER SPRINGS WHEN A TEMPERATURE BELOW ZERO DEGREES IS
ANTICIPATED FOR THE FULL 1250 HOURS LIFE. THE RUBBER SPRINGS SHOULD BE REINSTALLED WHEN THE
LEVEL OF BELOW ZERO DEGREES TEMPERATURES IS PAST.

5. WHEN THE RUBBER SPRINGS ARE REMOVED FROM THE AIRCRAFT ALL
MECHANICAL PROTECTION AGAINST MAST BUMPING IS GONE. WHEN OPERATING
THE AIRCRAFT UNDER THIS CONDITION, EXTREME CARE SHOULD BE TAKEN TO
OPERATE WITHIN THE OPERATOR'S MANUAL GUIDANCE AND WITHIN THE
PRESCRIBED FLIGHT ENVELOPE. IT SHOULD ALSO BE NOTED THAT WITH THE
RUBBER SPRINGS REMOVED THE CREW WILL NOTICE METAL TO METAL CONTACT
OF THE HUB AND MAST DURING RUN UP AND COAST DOWN, ESPECIALLY DURING
WINDY CONDITIONS (WIND LIMITATIONS SPECIFIED IN THE 10
MANUAL). THIS IS NORMAL AND ALSO OCCURRED PRIOR TO INSTALLATION OF
THE RUBBER SPRING MOD. HUB TO MAST CONTACT DURING THESE CONDITIONS
(LOW RPM) IS NOT DETRIMENTAL TO THE AIRCRAFT.

6. PROPER STORAGE OF REMOVED PARTS PERTAINING TO THIS MOD IAW DA
PAMPHLET 738-751 SHOULD BE COMPLIED WITH TO AVOID LOSS OF TIME WHEN
REINSTALLING THE AIRCRAFT.

7. IN SUMMARY, THE HUB SPRING IS A SAFETY IMPROVEMENT TO THE UH-1
AIRCRAFT AND IT SHOULD BE FULLY INSTALLED TO PROVIDE AN INCREASED
MARGIN OF SAFETY AGAINST MAST BUMPING. WHEN THE RUBBER SPRINGS ARE
REMOVED DUE TO COLD WEATHER, THE GUIDANCE GIVEN IN PARA 3 ABOVE WILL
ASSURE SAFE OPERATION.

8. POINTS OF CONTACT -
   A. TECHNICAL POINT OF CONTACT FOR THIS MESSAGE IS MR. FRED
   KERSHAW, AMHS-AMV, DSN/AUTOVON 493-1803 ON COMMERCIAL 314/263-1803.
   C. FOREIGN MILITARY SALES (FMS) RECIPIENTS REQUIRING

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