***TB 1-1520-240-20-107**

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

ACTIONS TO REDUCE SUSCEPTIBILITY TO FLIGHT CONTROL LOCK-UP AND/OR UNCOMMANDED MANEUVERS

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

12 March 1999

NOTE

THIS PUBLICATION IS EFFECTIVE UNTIL RESCINDED OR SUPERSEDED.

1. Priority Classification. Urgent

a. Aircraft in Use. Upon receipt of this Technical Bulletin (TB) the condition status symbol of the cited aircraft will be changed to a **circled red //X//.** The **circled red //X//** entry will state "AIRCRAFT RESTRICTED TO FLIGHT OPERATIONS AND INSPECTION PROCEDURES IAW ASAM CH-47-99-ASAM-02." The affected aircraft will be inspected as soon as practical, but no later than the task/inspection suspense date. Failure to comply with the requirements of this TB within the time frame will cause **the** status symbol to be upgraded to a **red //X//.**

b. Aircraft in Depot Maintenance - Aircraft will not be issued until compliance with this ASAM has been completed.

c. Aircraft Undergoing Maintenance - Same as paragraph 1a.

b. Aircraft in Transit -

(1) Surface/Air Shipment - Within 10 flight hours or 14 days of arrival.

(2) Ferry Status -

(a) Inspect at final destination.

(b) Those aircraft that have a DD 250 and are at Boeing Helicopter Company will be inspected prior to ferry to final destination.

e. Maintenance Trainers (Category A and B) - Comply no later than 13 Aug 99.

f. Component/Parts in Stock at all Levels (Depot and Others) Including War Reserves - The statement “CH47-QQ-ASAM-02 NOT COMPLIED WITH” will be entered on the serviceability tag of all servocylinders listed in paragraph 6 of this message.

g. Components/Parts in Work (Depot Level and Others) - The statement “CH-47-99-ASAM-02 NOT COMPLIED WITH” will be entered on the serviceability tag of all servo-cylinders listed in paragraph 6 of this message.

2. Task/Inspection Suspense Date. Comply with paragraph 8 within the next 10 flight hours/14 days whichever occurs first.

3. Reporting Compliance Suspense Date. No later than 9 Mar 99 IAW paragraph 14A of this message.

4. Summary of Problem.

a. The H-47 community has reported several incidents in which the aircraft experienced uncommanded maneuvers or flight control lock up in flight. The USASC, AMCOM, and Boeing are conducting an investigation into this hazard. The investigating agencies analyzed suspect components and performed analytical teardowns. AMCOM issued CH-47-98-ASAM-01 and CH-47-96-ASAM-06 as a result of the reported incidents. Factors which have been present and may contribute to uncommanded maneuvers or flight control lock-up include, but are not limited to:

(1) Contamination of hydraulic fluid.

(2) Internal parts out of tolerance.

(3) Corrosion on Internal parts.

(4) High barium content in preservative hydraulic fluids.

(5) Hands off flying,

(6) Internal foreign object damage (FOD) created by wear of aluminum parts.

The investigation team conducted simulations to analyze the interaction of these factors with

aircraft flight. The simulations demonstrated that when such factors are present and actual hands on flying is not being observed, the aircraft may perform uncommanded movements with a slow degradation in flight capabilities. The computer simulation is not sophisticated enough at this time to produce the exact maneuvers of the 'incident aircraft, therefore we have not been able to establish a rigorous cause and effect relationship between any single factor or combination of factors for which the specific flight control anomalies have occurred. To resolve corrosion hazards with the integrated lower control valve actuator (ILCA) control valve, the CH-47 PMO will fund and request an engineering change to manufacture the control valve from corrosive resistant material.

b. For manpower/downtime and funding impacts. See paragraph 12.

c. The purpose of this TB is to eliminate those known deficiencies which have been identified as suspect causes of uncommanded maneuvers or flight control lock up.

5. End Items to be Inspected. All CH-47D, MH-47D, and MH-47E Helicopters.

6. Assembly to be Inspected. The following components with a 1,200 hour TBO will be inspected. and reported to the Logistical Point of Contact (POC).

Nomenclature	Part Number	NSN
Servocylinder, Pivoting	145H6600-9	1650-01-151-1713
Servocylinder, Pivoting	145H6600-10	1650-02-151-5459
Servocylinder, Pivoting	145H6600-11	1650-01-118-5627
Servocylinder, Pivoting	145H6600-12	1650-01-117-4131
Servocylinder, Swiveling	145H6700-8	1650-01-118-5628
Servocylinder, Swiveling	145H6700-9	1650-01-119-7412
Servocylinder, Swiveling	145H6700-10	1650-01-151-9231
Servocylinder, Swiveling	145H6700-11	1650-01-151-9232

7. Parts to be Inspected. N/A.

8. Inspection Procedures.

a. Perform a visual inspection of the forward and aft pivoting and swiveling servocylinders (4 servocylinders per aircraft) to determine part number.

b. If a servocylinder listed in paragraph 6 is Installed, the historical records will be reviewed to determine the hours accrued.

c. Each unit will notify the Logistical POC with the number of servocylinders that are affected. The serial number of the aircraft on which the components are installed along with the component serial number, part number, time remaining until TBO and an estimated date that components will reach TBO will be repotted to the Logistical POC.

9. Correction Procedures -

NOTE

Ensure that all closed or stand alone hydraulic components such as landing gear strut assemblies and blade lag shock absorbers are serviced with MIL-H-5606 only.

a. Units which have inspected and reported servocylinders listed in paragraph 6 will fund the Enhanced Special Repair Activity (ESRA) locations at Ft. Campbell or Ft. Rucker to:

(1) Order replacement steel end caps and associated hardware for the reported servocylinders. The aluminum end caps will be replaced with chrome plated steel end caps. The new steel end caps are not available at this time. Units will replace the actuator or have the ESRA change the end caps NLT 30 June 2001. All servocylinders which have chrome plated aluminum end caps will be replaced to reduce the possibility of chrome flakes contaminating the system.

(2) Replace the individual parts which were ordered for the servocylinders.

(3) Perform a leak check of the repaired servocylinders.

b. For any flight control or utility system hydraulic component received from supply, maintenance personnel will drip drain preservative fluid. Maintenance personnel will manually stroke actuators, rotating pump shafts, and motor shafts (if possible) to purge all preservative fluid. Refill the component with MIL-H-83282 prior to installation (if possible).

C. Use factory sealed hydraulic fluid containers only. Do not use hydraulic fluids that have been exposed to the environment. Hydraulic fluids have a natural tendency to absorb moisture which will contaminate the fluid and increase the probability of corrosion damage.

d. Continue to observe proper maintenance procedures for aircraft hydraulic systems:

(1) Upon removal for maintenance, cap or plug all disconnected lines, fittings, and components as soon as practical.

(2) Inspect for contamination all hydraulic components and lines not installed on aircraft or in supply. Cap those components and lines after inspection and/or cleaning.

e. Upon receipt of the purification equipment, hydraulic system purification will be performed at the end of each phase inspection. Units will purify all aircraft hydraulic systems to remove water, chlorine, and particles. The CH-47 PM Office (PMO) is acquiring hydraulic purifiers for each CH-47 unit and AVIM that supports the CH-47 fleet. These purifiers will remove water, chlorine, and particles from the aircraft hydraulic system. Each unit and AVIM will provide a local POC to the Logistics POC listed in paragraph

16B. The Logistics POC will contact the local POC when the purification equipment is available. An OLR team will train unit personnel to operate the purifier. Replacement filters and maintenance of the purifier will be the responsibility of the owning unit.

f. Perform the ILCA Jam Test, Phase 1, of TM 55-1520-240-23-6, Task 7-104.1 or TM 1-1520-252-23-7, Task 7-124 prior to the first flight of each day. Annotate DA Form 2408-13-1 to reflect this inspection requirement. The following precautions will be taken to minimize wear and tear on the jam buttons and their seals:

CAUTION

Excessive force applied to the jam button may cause damage to the button, requiting the replacement of the entire actuator assembly.

(1) Clean the jam button with a dean cloth prior to performing the test.

(2) Do not use a steel tool to depress the button. Use hand pressure with a drift made of a softer material such as aluminum, brass, or wood to depress the button.

g. Commanders and unit instructor pilots will brief all flight crews that the AFCS is not an automatic pilot and it is imperative that a pilot continuously monitor aircraft attitude while utilizing the functions of AFCS. In the event the aircraft deviates from the desired attitude the pilot will immediately man the flight controls and make corrective inputs to correct deviations.

h. All Depots, Field/Support Units, and Contractor Maintenance Facilities will not use alcohol or chlorinated solvents or cleaners in hydraulic maintenance or to clean parts of the hydraulic system.

i. All Depots, Field/Support Units, and Contractor Maintenance Facilities will ensure that hydraulic test stands for H-47 Flight Control and Utility System Components are serviced with MIL-H-83282. This fluid will be used as a preservative fluid to eliminate traces of barium in hydraulic components. MIL-H-83282 contains sufficient corrosion protection for component storage.

j. Number 1 and Number 2 Flight Boost Pressure and Return Fitter Elements will be replaced at the next phase and every 400 hours thereafter. ULLS-A units will use Inspection Legitimate Code Number A-380 for the Number 1 and 2 Flight Boost Pressure and Return Filter Replacement due every 400 hours.

10. Supply/Parts and Disposition.

a. Parts Required - Items cited in paragraph 6 are required to be replaced or have end caps replaced.

b. Requisitioning Instructions - Requisition replacement parts through normal supply channels using normal supply procedures. All requisitions will use Project Code “XFD” (X-Ray-Foxtrot-Delta) per this TB. Units deciding to requisition end caps and pay to have the ESRA at Fort Rucker or Fort Campbell install them should contact the ESRA site directly. See Logistical POC.

c. Bulk and Consumable Materials. N/A.

d. Disposition - Dispose of removed parts/components using normal supply procedures. A QDR is not required. Hold any unserviceable part/component pending disposition instructions from the Logistical POC in paragraph 16B.

e. Disposition of Hazardous Material - IAW Environmental Protection Agency Diredives as implemented by your servicing environmental coordinator (AR 200-1).

11. Special Tools and Fixtures Required - OLR Teams will furnish special purification equipment.

12. Application.

a. Category of Maintenance - AVUM and OLR Team. Aircraft downtime will be charged to AVUM Maintenance.

b. Estimated Time Required.

(1) Total of 1-man-hour using 1 person per aircraft to inspect and report upper boost actuators.

(2) Total of 1 hour downtime for one end item.

c. Estimated Cost Impact to the Field.

NOMENCLATURE	PART NUMBER/NSN	QTY	COST EACH	TOTAL $
Servocylinder	145H6600-20 1650-01-303-7897	1	$ 8,990.06	$ 8,990.06
Servocylinder	145H6600-19 1650-01-304-9016	1	$ 8,989.00	$ 8,989.00
Servocylinder	145H6700-18 1650-01-303-7898	1	$ 14,813.03	$ 14,813.03
Servocylinder	145H6700-19 1650-01-302-0076	1	$ 16,850.38	$ 16,850.38
End Cap	114H4007-3 1650-01-306-6403	2	$ 511.06	$ 1,022.12
End Cap	114H4007-4 1650-01-311-1182	2	$ 855.04	$ 1,710.08

End Cap	114H4048-3 1650-01-308-6402	2	$ 998.40	$ 1,996.80
End Cap	114H4048-4 1650-01-310-5859	2	$ 855.40	$ 1,710.80
Filter Element	AC-A62OF5 1650-01-114-6385	4	$ 102.48	$ 409.92
Packing	M83461/1-132 5330-01-146-4563	4	$ 0.18	0.72
Retainer	MS28744-132 530-00-848-91283	4	$ 0.26	$ 1.04
Packing	MS28775-017 5330-00-618-1920	4	$ 0.03	$ 0.12
sacking	M83461/1-024 5331-01-107-9249	4	$ 0.11	$ 0.44
Pin, Roll	79-022-094-0375 5315-00-039-5563	8	$ 0.63	$ 5.04
Retainer	MS28774-128 5330-00-892-1608	8	$ 0.18	$ 1.44
Packing	MS28775-128 5330-00-702-5643	8	$ 0.13	$ 1.04
Pin, cotter	MS24665-153 5315-00-241-7330	4	PER HD	$ 1.56
Nut	MS21224-5 5310-00-151-5430	4	$ 3.51	$ 14.04
Bolt	MS27576-4-19 5306-00-408-6864	4	$ 8.56	$ 34.24
Nut, Plain	AN320-8 5310-00-176-8112	2	PG	$ 17.08
Bolt	145R3650-6 5308-01-322-2892	2	$ 146.66	$ 293.32
Bolt	145R3650-5 5306-01-319-9023	2	$ 226.06	$ 452.12
BOlt	BACB3OST8-31 5306-00-008-5025	2	$ 36.38	$ 72.76
Bolt	BACB30ST8-35 5308-00-008-5027	2	$ 28.90	$ 57.80
Bolt	114R3650-3 1615-00-003-1146	2	$ 72.83	$ 145.66
Pin, Cotter	MS24665-374 5315-00-241-7332	4	PER HD	$ 2.70

Nut, Plain	AN320-10 5310-00-176-8114	2	$ 13.16	$ 26.32
Bolt	145R3650-1 1615-01-115-3609	2	$ 297.57	$ 595.14

TOTAL COST PER AIRCRAFT =

For aircraft replacing all actuators. $49,066.15

For aircraft having end cap replacements... . . . . .$5,863.48

d. TB/MWOs to be applied prior to or concurrently with this inspection - N/A.

e. Publications which require change as a result of this inspection -

(1) TM 55-1520-240-23

(2) TM 1-1520-252-23

(3) TM 1-1520-252-PM

(4) TM 55-1520-240-PM

(5) TM 55-1520-240-PMD

(6) TM 1-1520-252-PMD

(7) Hydraulic Component DMWR's will be changed to reflect this TB. A copy of this TB will be inserted in the appropriate publication as authority to implement the change until the printed change is received.

13. References -

a. TM 55-1520-240-23P.

b. TM 1-1520-252-23P.

c. TM 55-1520-240-23.

d. TM 1-1520-252-23.

14. Recording and Reporting Requirements -

a. Reporting Compliance Suspense Date (Aircraft) - Upon entering requirements of this TB on DA Form 2408-13-1 on all subject Mission Design Series (MDS) aircraft, forward a priority message, Datafax or E-Mail to Commander, AMCOM, ATTN: AMSAM-SF-A, (SOF Compliance Officer), Redstone Arsenal, AL 35898-5222, IAW AR 95-1. Datafax number is DSN 897-2111 or Commercial (256) 313-2111. E-Mail address is safeadm@redstone.armv.mil. The report will cite this TB, date of entry in DA Form 2408-13-1, the aircraft mission design series and serial numbers of aircraft in numerical order.

b. Task/Inspection Reporting Suspense Date (Aircraft) - Upon completion of inspection, units will forward a priority message to: PM CH-47, ATTN: SFAE-AV-CH-L, DSN 897-4304 or (256) 313-4304, olsonw@peoavn.redstone.army.mil. The report will cite this TB, date of inspection, aircraft serial number, aircraft and component hours, and results of the inspection. Inspection and reports will be completed no later than 30 days after task/inspection suspense date.

c. Reporting Message Receipt (Spares) -

(1) Materiel in Wholesale Depot Storage - N/A.

(2) Materiel in Retail Storage - N/A

d. Task/Inspection Reporting Suspense Date (Spares) - N/A.

e. The following forms are applicable and are to be completed IAW DA Pam 738-751, 15 Jun 92 -

NOTE

ULLS-A users will use applicable “E” forms.

(1) DA Form 2408-5-1, Equipment Modification Record (actuator).

(2) DA Form 2406-13, Aircraft Status Information Record.

(3) DA Form 2406-13-1, Aircraft Inspection and Maintenance Record.

(4) DA Form 2408-14, Uncorrected Fault Record.

(5) DA Form 2405-15, Historical Record For Aircraft.

(6) DA Form 2408-16, Aircraft Component Historical Record. (If actuator is removed/replaced).

(7) DA Form 2408-18, Equipment Inspection List.

(8) DA Form 2410, Component Removal and Repair/Overhaul Record. (If actuator Is removed/replaced).

(9) DD Form 1574/DD Form 1574-1, Serviceable Tag/Label - Materiel (color yellow). Annotate remarks block with “Inspected serviceable IAW CH-47-99-ASAM-02.”

(10) DD Form 1577-2/DD Form 1577-3, Unserviceable (Reparable) Tag/Label - Materiel (color green). Annotate remarks block with unserviceable IAW CH-47-99-ASAM-02."

15. Weight and Balance - N/A.

16. Points of contact

a. Technical POC for this TB is Mr. Matt Wesselschmidt, AMSAM-AR-E-I-C-H, DSN 897-4286 or (258) 313-4286. Datafax is DSN 897-4348 or (258) 313-4348. E-mail is wesselschmidt-ml@redstone.army.mil.

b. Logistical POC for this TB is Mr. Bill Olson, SFAE-AV-CH-L, DSN 897-4304 or (258) 313-4304, Datafax is DSN 697-4348 or (258) 313-4348. E-mail is olsonw@peoavn.redstone.army.mil.

c. Forms and records POC for this TB is Ms. Ann Waldeck, AMSAM-MMC-RE-FF, DSN 746-5564 or (258) 876-5564, Datafax is DSN 746-4904 or (256) 876-4904. E-mail is waldeck-ab@redstone.army.mil.

d. Safety POC for this TB is Mr. Robert Brock, AMSAM-SF-A, DSN 788-6632 or (256) 842-8632, Datafax Is DSN 897-2111 or (256) 313-2111. E-mail is brock-rd@redstone.army.mil..

e. Foreign Military Sales (FMS) recipients requiting clarification of action advised by this TB should contact: CW5 Joseph L. Wittstrom, Security Assistance Management, AMSAM-SA, DSN 897-0681 or (258) 313-0681. E-mail is wittstrom-il@redstone.army.mil or Mr. Ronnie W. Sammons, AMSAM-SA-CS-NF, DSN 897-0869 or (258) 313-0869. DATAFAX is DSN 897-0411 or (258) 313-0411. E-mail is sammons-rw@redstone.army.mil. Huntsville, AL is GMT minus 6 hrs.

f. After hours contact the AMCOM Command Operations Center (COC) DSN 897-2066/7 or (258) 313-2066/7.

17. Reporting of Errors and Recommending Improvements. You can help improve this TB. You may submit your recommended changes by E-mail directly to Is-lp@redstone.army.mil. A reply will be furnished to you. Instructions for sending an electronic 2028 may be found at the back of this manual.

By Order of the Secretary of the Army:

DENNIS J. REIMER
General, United States Army
Chief Of Staff

Official:

JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
05301

DISTRIBUTION:
To be distributed in accordance with Initial Distribution Number (IDN 313815), requirements for TB 1-1520-240-20-107.

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: <mpmt%avma28@st-louis-emh7.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. tine: 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.