URGENT

***TB 1-1520-240-20-85**

DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

ONE TIME VISUAL INSPECTION AND RECORDS CHECK OF THE UPPER BOOST ACTUATORS AND PULL TEST OF SWASHPLATE FOR ALL CH-47D, MH-47D, AND MH-47E AIRCRAFT

Headquarters, Department of the Army, Washington, D. C.
22 JULY 1996

NOTE
THIS PUBLICATION IS EFFECTIVE UNTIL RESCINDED OR SUPERSEDED.

1. Priority Classification - Urgent.

NOTE
See AR 95-3, paragraph 5-6a, for noncompliance authority of major commanders.

a. Aircraft in Use - Upon receipt of this Technical Bulletin (TB) the condition status symbol of the cited aircraft will be changed to a **Red Horizontal Dash** "-". The **Red Horizontal Dash "-"** may be cleared when the inspection of paragraph 8, and the corrective procedures of paragraph 9 is completed. The affected aircraft shall 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 - Inspect and correct prior to issue. Actuators that indicate they were overhauled, shall be replaced with new or overhauled actuators that have suffix 'N" behind the serial number.

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

d. Aircraft in Transit -

(1) Surface/Air Shipment - Same as paragraph 1a.

(2) Ferry Status - Same as paragraph 1a.

e. Maintenance Trainers (Category A and B) - Same as paragraph 1a.

*This TB supersedes USAATCOM Message 271541Z June 1996 (CH-47-96-ASAM-06)

f. Component/Parts in Stock at All Levels (Depot and Others) Including War Reserves - Upon receipt of this TB the materiel condition tags of all upper boost actuators in all condition codes listed in paragraph 6 below shall be annotated to read "TB 1-1520-240-20-85, One Time Visual and Records Inspection of the Upper Boost Actuators Not Complied With". No action required on swashplates.

(1) Wholesale Stock - Upper Boost Actuators Located in All Wholesale Depots Including All Satellite Wholesale Depots and War Reserve Depots - Report receipt of this TB in accordance with paragraph 14c(1). Upon receipt of this TB depot commanders and others maintaining wholesale stock shall ensure that serviceable materiel (condition codes "A", "B", and "C" is placed in condition code 'J" and tagged with a suspended tag/label - materiel DD Form 1576/1576-1. Annotate the remarks block with “TB 1-1520-240-20-85, Project Code XB9, One Time Inspection of the Upper Boost Actuators Required."

(2) Retail Stock - Upper Boost Actuators Located in Installation/Unit Storage - Report receipt of this TB in accordance with paragraph 14c(2) Upon receipt of this TB, commanders and others maintaining retail stock shall contact the support aviation organization to perform the inspection required by paragraph 8 and to perform the correction procedures of paragraph 9 on discrepant materiel. Actuators that indicate overhaul shall be placed in condition code "D" annotate tag with TB 1-1520-240-20-85, Project Code XB9, One Time Inspection of the Upper Boost Actuators Not Complied With, and returned to depot for rework. Report compliance with this TB in accordance with paragraph 14c(2).

g. Components/Parts in Work - Upper boost actuators listed in paragraph 6 will not be issued until compliance with this TB.

2. Task/Inspection Suspense Date - 10 hours or 14 days whichever occurs first.
3. Reporting Compliance Suspense Date - No later than 19 July 1996 per paragraph 14a of this TB.
4. Summary of the Problem.

a. An analysis of a CH-47D aircraft which experienced unexplained control binding has identified two potential flight control problems The first problem is an out of adjustment condition on upper dual boost actuators overhauled at Corpus Chnstl Army Depot (CCAD), and the second problem involves swashplate binding due to increased friction.

b. The primary problems with the CCAD overhauled actuators include control valve out of adjustment condition and the condition of the actuator control valve retainer ring.

(1) The potential problem with the control valve out of adjustment condition is that parked blade loads could react through the housing of the control valve rather than through the flight control linkage. This condition could lead to a failure of the internal components of the valve housing.

(2) The second potential problem with the actuators involves the retaining ring used in the actuators control valve. If the retaining ring is yielded or sprung open during installation, it is possible that the inner sleeve of the control valve will not reset after secondary valve operation. Secondary valve operation can occur under certain parked blade load conditions.

c. The problem with the flight controls swashplates binding is the result of increased friction on the uniball which may cause wear, binding, and scoring of the uniball.

d. For Manpower/Downtime and Funding Impacts - See paragraph 12.

e. The purpose of this TB is to Inspect/perform a one time records check to identify of the upper boost actuators (P/N 145H6600 and 145H6700) that have been overhauled by CCAD, assign a maximum of 12 months operating time for CCAD overhauled actuators from the date of this TB, to conduct a forward and aft swashplate pull/friction test, and to require upper boost actuator blocks, P/N 114E5900-17, be installed anytime the hydraulic power is off for aircraft that have one or more overhauled actuators installed. The swashplate discrepancies will be repaired as necessary in accordance with TM or returned to depot.

f. All aircraft that have one or more overhauled actuators installed must have upper boost actuator blocks, P/N 114E5900-17, installed anytime the hydraulic power is off.

WARNING

Remove blocks when the hydraulic power is supplied.

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

6. Assembly Components to be Inspected **-**

NOMENCLATURE	PART NUMBER	NATIONAL STOCK NUMBER
Upper Boost Actuator	145H6600-9	1650-01-151-1713
	145H6600-10	1650-01-151-5459
	145H6600-11	1650-01-118-5627
	145H6600-12	1650-01-117-4131
	145H6600-19	1650-01-304-9016
	145H6600-20	1650-01-303-7897
Upper Boost Actuator	145H6700-8	1650-01-118-5628
	145H6700-9	1650-01-119-7412
	145H6700-10	1650-01-151-9231
	145H6700-11	1650-01-151-9232
	145H6700-18	1650-01-303-7898
	145H6700-19	1650-01-302-0076
Swashplate Assembly	145R3551-1	1615-01-115-3623
	145R3551-2	1615-01-115-3610
	145R3551-5	1615-01-315-5133
	145R3551-6	1615-01-317-2432
	145R3551-11	1615-01-352-8575
	145R3551-12	1615-01-352-8576
	145R3551-17	1615-01-395-0006
	145R3551-18	1615-01-395-0007

7. Parts to be Inspected - N/A.

8. Inspection Procedures -

a. Perform a one time records check of the upper boost actuators to determine if CCAD overhauled the actuator. If records check is inconclusive, perform visual inspection of the component data plate. If the unit is unable to determine if CCAD overhauled the actuators, report as unidentifiable. Report the results to logistical point of contact (paragraph 16b). *Corpus Christi Army* Depot *actuators may* be *operated up to* 12 months from the date of this TB provided paragraph 9a below is complied with.

b. Perform uniball bearing friction checks, Task 5-114 and swashplate bearing friction check, Task 5-115 of TM 55-1520-240-23 and for the 'E" model TM 1-1520-252-23, Task 5-165 and 5-167. Report the results to technical point of contact (paragraph 16a) per paragraph 14b(1) of any swashplate that fails the frictional pull checks per paragraph 14b(2).

9. Correction Procedures -

a. Aircraft that have one or more CCAD overhauled actuators installed may be flown for up to 12 months from the date of this TB, and must have upper boost actuator blocks, P/N 114E5900-17, NSN 1730-01-264-6254 installed anytime the hydraulic power is off.

WARNING

Remove blocks when the hydraulic power is supplied.

b. Overhauled upper boost actuators shall be replaced within the next 12 months with a new actuator or an overhauled actuator that has been properly adjusted. The overhauled units that have been properly adjusted by depot will be marked with a suffix "N" behind actuators serial number.

c, If the swashplate fails the friction check (Task 5-115 for the CH-47D/MH47D and Task 5-167 for the MH-47E) follow correctional procedures provided in that task.

d. If swashplate fails the uniball friction check (Task 5-114 for the CH-47D/MH-47D and Task 5-165 for the MH47E), reinspect using the following alternate criteria/procedure:

(1) If reading is greater than 63.5 and less than 80 lbs, perform axial play inspection (Task 5-114.1 and Task 5-166 for E model). If play is within limits, swashplate friction is acceptable.

(2) If reading is greater than 80 lbs, perform the axial play inspection, Task 5-114.1 and Task 5-166 for E model.

(3) If axial play is out of limits, correct per manual. If axial play is within limits, proceed with alternate friction check as identified in steps 4 through 16.

(4) Perform initial setup and steps 1 through 6 of Task 5-114 and Task 5-166 for E model.

(5) Remove hydraulic and electrical power from the helicopter.

WARNING

Do not apply hydraulic pressure to move actuating cylinders when personnel are making swashplate friction check. Injury to personnel can result.

(6) Remove cotter pin, nut, washer, and bolt from upper end of LCT actuator.

CAUTION

LCT end of stationary swashplate may tend to move downward with both bolts removed. Ensure clearance with LCT actuator and link.

(7) Remove cotter pin, nut, washer, and bolt from upper end of link.

(8) Install bolt in any lug of the swashplate rotating ring and position this lug opposite of the LCT/link arm of the swashplate stationary ring.

(9) Attach dial indicator scale to bolt.

(10) Pull scale down in a curved motion following path of swashplate as it tilts. Read scale after ring begins to move. Force needed to keep swashplate moving shall be less than 63.5 lbs.

NOTE

Do not read force needed to start swashplate tilt. This includes added force needed to overcome inertia.

(11) If force is greater than 63.5 lbs, replace swashplate.

(12) Remove scale, remove bolt.

(13) Install LCT bolt, washer, nut either lAW install AFT swashplate Task 5-133, or install FWD swashplate Task 5-132 for CH-47D/MH-47D aircraft, or install AFT swashplate Task 5-188, or install FWD swashplate Task 5-187 for MH-47E aircraft.

(14) Install link bolt, washer, nut either lAW Install AFT swashplate Task 5-133, or install FWD swashplate Task 5-132 for CH-47D/MH-47D aircraft, or install AFT swashplate Task 5-188, or install FWD swashplate Task 5-187 for MH-47E aircraft.

(15) Position swashplate for pitch change link installation.

(16) Remove twine from lower end of pitch links. Follow-on maintenance: Connect pitch link upper end (Task 5-99 for CH-47D/MH-47D, and Task 5-148 for MH-47E); close work platform (Chapter 2); and remove tie down lines from forward and AFT blades (Chapter 1).

e. A flight test is required only if components are replaced, or swashplate is removed/reinstalled.

10. Supply/Parts and Disposition -

a. Parts Required - N/A.

b. Requisitioning Instructions - Replacement parts through normal supply channels using normal supply procedures. All requisitions shall use project code "XB9" per this TB.

NOTE

Project code "XB9" is required to track and establish a data base of stock fund expenditures incurred by the field as a result of this TB.

c. Bulk and Consumable Matenels - N/A..

d. Disposition - A QDR is not required.

e. Disposition of Hazardous Materiel - N/A..

11. Special Tools, Jigs and Fixtures Required - N/A..

12. Application -

a. Category of Maintenance - Initial inspection AVUM.

b. Estimated Time Required -

(1) Total of 32 man-hours using four persons.

(2) Total of eight hours downtime for one end item.

c. Estimated cost impact of stock fund items to the field - $104,309

NOMENCLATURE	PART NUMBER/ NATIONAL STOCK NUMBER	QTY	TOTAL COST
Upper Boost Actuator	145H6600-19/1650-01-304-9016	1	$9,277
	145H6600-9/1650-01-151-1713	1	$9,277
	145H6600-11/1650-01-118-5627	1	$9,277
	145H6600-20/1650-01-303-7897	1	$9,279
	145H6600-1 0/1650-01-151-5459	1	$9,279
	145H6600-12/1650-01-117-4131	1	$9,279
	145H6700-19/1650-01-302-0076	1	$17,391
	145H6700-11/1650-01 -151-9232	1	$17,391
	145H6700-9/1650-01-119-7412	1	$17,391
	145H6700-18/1650-01-303-7898	1	$15,288
	145H6700-10/1650-01-151-9231	1	$15,288
	145H6700-8/1650-01-118-5628	1	$15,288
Swashplate, Forward	145R3551-17/1650-01-395-0006	1	$76,438
	145R3551-1/1650-01-115-3623	1	$76,438
	145R3551-11/1650-01-352-8575	1	$78,171

NOMENCLATURE	PART NUMBER/ NATIONAL STOCK NUMBER	OTY	**TOTAL COST**
	145R3551-5/1650-01-315-5133	1	$78,171
Swashplate, AFT	145R3551-18/1650-01-395-0007	1	$76,438
	145R3551-02/1650-01-115-3610	1	$78,438
	145R3551-12/1650-01-352-8576	1	$78,171
	145R3551-6/1650-01-317-2432	1	$78,171
Upper Boost Actuator	114E5900-1 7/1730-01-264-6254	1	$206
Block	114E5900-14/1730-00-034-3874	1	$206
Container	8145-00-536-4925	1	$122
	8145-00-514-2798	1	$118
Sperical Bearing	114RS313-1/1615-00-893-0891	2	$339.97
Retaining Ring	145H6624-1/5365-01-116-4271	4	$16.80
	145H6625-1/5365-01-116-4273	4	$2.45
		Total Cost Per Aircraft **-**	$104,309

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 - TM 55-1520-240-23 (TM 1-1520-252-23 for the "E") installations of swashplate Tasks 5-132 and 5-133 (Tasks 5-187 and 5-188 for the "E") tasks shall be changed to add beanng frictional and uniball checks Tasks 5-114, 5-114.1 and 5-11 5 (Tasks 5-165, 5-166 and 5-167 for the SE"). A special inspection shall be inserted in TM 55-1520-240-23 (TM 1-1520-252-23 for the "E") to perform the swashplate pull test in accordance with Tasks 5-114, 5-114.1 or 5-115 (Tasks 5-165 and 5-166 or 5-167 for the "E") on swashplate installation. Task 5-125 shall be changed to read "Lightly coat outside surfaces of spherical bearing, P/N 114RS313-1, with epoxy primer and allow to dry before installation." A copy of this TB shall be inserted in the appropriate TM (pen and ink changes can be made) as authority to implement the change until the printed change is received.

13. References-

a. TM 55-1520-240-23

b. 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 MDS aircraft, forward a priority message, datafax or E-Mail to Commander, ATCOM, ATTN: AMSAT-R-X (SOF Compliance Officer), per AR 95-3. Datafax number is DSN 693-2064 or commercial (314) 263-2064. E-Mail address is "amsatrxs@emh4.stl.army.mil". The report will cite this TB number, 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) -

(1) Report actuators details within two working days of receipt of this TB. Units will forward a priority message to: Commander, ATCOM, ATTN. AMCPM-CH-L. The report will cite this TB number and date of inspection. It will list all CCAD overhauled actuators by part numbers, serial numbers and number of aircraft impacted.

(2) For swashplates that are installed on aircraft only and fail Task 5-114 and/or the alternate procedures shall report details within 14 working days of receipt of this TB. Units will forward a priority message to: Commander, ATCOM, ATTN: AMSAT-R-ECC, or datafax the information to Larry Wiechhaus at DSN 693-1485 or commercial (314)263-1485. The report will cite this TB number, date of inspection, aircraft senal number, swashplate serial number, measured drag, axial play and hours on the swashplate.

The report shall include both the results from Task 5-114 and the alternate procedures in paragraph 9d of this TB.

c. Reporting Compliance Suspense Date (Spares) -

(1) Materiel in Wholesale Depot Storage Report receipt of this TB to the wholesale materiel (spares) point of contact listed in paragraph 16c within 2 days from the date of this TB.

(2) Materiel in Retail Storage. Report receipt of this TB to logistical point of contact listed in paragraph 16b within 2 working days from the date of this TB.

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

(1) Materiel In Wholesale Depot Storage - Report compliance with this TB to the wholesale materiel (spares) point of contact listed in paragraph 16c within 2 working days from the date of this TB. Provide an estimate of the cost reimbursable funding required to move the items listed in paragraph 6 to a work area, unpack the materiel, repack the materiel after inspection by ATCOM inspectors, and to return the materiel to storage. Report the serial numbers, by original serviceable condition code, of all materiel placed in condition code "J". Not applicable to swashplate.

(2) Materiel in Retail Storage - Report compliance with this TB to the logistical point of contact in paragraph 16b within 2 working days of the date of this TB. Report the quantity inspected by condition code, and the resulting condition code. Report the serial numbers of all materiel requiring correction. Place these items in condition code 'D" and provide copies of shipping documents to wholesale materiel point of contact listed in paragraph 16c. Not applicable to swashplates.

e. The following forms are applicable and are to be completed in accordance with DA PAM 738-751, 15 June 1992-

(1) DA Form 2408-5-1, Equipment Modification Record (Component)
(2) DA Form 2408-13, Aircraft Status Information Record.
(3) DA Form 2408-13-1, Aircraft Inspection and Maintenance Record.
(4) DA Form 2408-15, Historical Record for Aircraft.
(5) DA Form 2408-16, Aircraft Component Historical Record.
(6) DA Form 2408-18, Equipment Inspection List
(7) DA Form 2410, Component Removal and Repair/Overhaul Record.
(8) DD Form 2408-18, Equipment Inspection List
(9) DD Form 1574 (Yellow Tag) for in stock items that are determined to be serviceable. (Mark inspected serviceable in accordance with this TB).
(10) DD Form 1575 (Brown Tag) for in stock items in suspended status awaiting inspection. (Mark suspended in accordance with this TB).
(11) DD Form 1577 (Red Tag) unserviceable (condemned) for in stock items that are deter- mined to be unserviceable. (Mark unserviceable in accordance with this TB).
(12) DD Form 1577-2 (Green Tag) unserviceable (reparable) for in stock items that are determined to be reparable. (Mark unserviceable in accordance with this TB).

15. Weight and Balance - N/A.
16. Points of Contact -

a. Technical points of contact for this TB are Mr. Michael Wright or Mr. Robert A. Lawyer, AMSAT- R-ECC, DSN 693-3550/-3820 or commercial (314)263-3550/-3820, respectively.

b. Logistical point of contact for this TB is Mr. Mike Melliere, AMCPM-CH-L, DSN 693-1901 or commercial (314)263-1901, data fax DSN 693-1485 or commercial (314)263-1485.

c. Wholesale Materiel point of contact (spares) for this TB is Mr. Hal Barnes, AMSAT-I-SACA, DSN 693-6031 or commercial (314)263-6031 and Data Fax DSN 693-6022 or commercial (314)263-6022.

d. Forms and records point of contact for this TB is Ms. Ann Waldeck, AMSAT-I-MDM, DSN 490-2318 or commercial (314)260-2318.

e. Safety point of contact for this TB is Mr. Jim Wilkens. AMSAT-R-X, DSN 693-2258 or commercial (314)263-2258.

f. Foreign Military Sales (FMS) recipients requiring clarification of action advised by this TB should contact Mr. Ron Van Rees, AMSAT-I-IAF, DSN 693-3826/-3659 or commercial (314)263-3826/-3659.

g. After hours contact ATCOM Command Operations Center (COC) DSN 693--2066/-2067 or commercial (314)263-2066/-2067.

17. Reporting of Errors and Recommending Improvements. You can help improve this TB. If you find any mistakes or if you know of a way to improve these 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 Troop Command, ATTN: AMSAT-I-MP, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished to you. You may also submit your recommended changes by E-mail directly to <mpmt%avma28@st-louis-emh7.army.mil>. A reply will be furnished directly to you.

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
01962

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