

ALERT SERVICE BULLETIN

Bell Helicopter **TEXTRON**

A Subsidiary of Textron Inc.

NO. 412-00-105

DATE 10-19-00

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DATE
REV

MODEL AFFECTED: 412

**SUBJECT: MAIN HYDRAULIC SERVO ACTUATOR ROD
END LOCK WASHER, INSPECTION AND
REPLACEMENT OF**

HELICOPTERS AFFECTED: All Model 412/412EP helicopters

[Model 412EP helicopters serial numbers 36270 and subsequent will have the intent of this bulletin accomplished prior to delivery.]

COMPLIANCE: Initial inspection of the existing lock washer is required within 25 flight hours.

Within 100 hours of operation after receipt of this bulletin or during the next scheduled overhaul, whichever occurs first, replace locking tab.

DESCRIPTION:

Main hydraulic cylinder assemblies (212-076-005-all) presently utilize a rod end-locking device P/N NAS513-6. If this locking device is damaged during installation, the hydraulic servo piston can back itself out of the rod end. An investigation into a similar customer report has concluded that all existing lock washers NAS513-6 are to be replaced by a two part locking device P/N NAS1193K6C.

APPROVAL:

The engineering design aspects of this bulletin are FAA/DER approved.

MANPOWER:

Refer to attached HR Textron Alert Service Bulletins 41000470-67A-05.

7051 50192 REV 1198

MATERIAL:

Required Material:

The following material is required for the accomplishment of this bulletin and may be obtained through your Bell Helicopter Textron Supply Center.

-Note-

Locking device P/N NAS1193K6C consists of one each P/N NAS1193K6-1 and NAS1193K6-2. When ordering the locking device from BHT please order one each of P/N NAS1193K6-1 and NAS1193K6-2.

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>
NAS1193K6-1	Locking Device (half)	1 (per Cyl. Assy.)
NAS1193K6-2	Locking Device (half)	1 (per Cyl. Assy.)
212-076-121-111	Decal	1 (per Cyl. Assy.)

SPECIAL TOOLS:

None required

ELECTRICAL LOAD DATA:

Not affected

REFERENCES:

BHT-412-IPB Illustrated Parts Breakdown
BHT-412-MM Maintenance Manual
Refer to attached HR Textron Alert Service Bulletins 41000470-67A-05.

PUBLICATIONS AFFECTED:

BHT-412-IPB Illustrated Parts Breakdown
BHT-412-MM Maintenance Manual

ACCOMPLISHMENT INSTRUCTIONS:

1. Refer to the attached copy of the HR Textron Alert Service Bulletin 41000470-67A-05 for accomplishment instructions.

ALERT SERVICE BULLETIN

FLIGHT CONTROLS – HYDRAULIC SERVO ACTUATOR INSPECTION FOR DAMAGED LOCKING WASHER

1. Planning Information

A. Effectivity

This alert service bulletin applies to all configurations of hydraulic servo actuator, HR part number 41000470 (BHTI part number 212-076-005), with serial numbers less than and including HR10010. The actuators control the main rotor on Bell 212/412 aircraft (and some modified 205A1/205B aircraft). This ASB instructs operators to inspect their actuators, and to replace the locking washer that attaches the rod end assembly to the piston. Locking washer shall be replaced immediately if damaged, or within a specified time increment if not damaged. All new production units beginning with serial number HR10011 will reflect the new configuration created by this change, identified by manufacturer part number 41000470-105 (BHTI part number 212-076-005-111).

B. Reason

A customer recently discovered a damaged locking washer that had allowed the piston to back itself out of the locking jam nut (Figure 1). This condition prevented the aircraft from taking off and presented a Safety of Flight condition. Bell Helicopter's subsequent investigation determined that all existing locking washers NAS513-6 used on applicable actuators shall be replaced with new locking devices NAS1193K6C.

C. Description

The intent of this ASB is to have all existing locking washers in this application removed from service. This requires a mandatory inspection, within 25 hours of operation after receipt of ASB, while actuator still is installed on the aircraft. The mandatory inspection then is to be followed by the mandatory removal of affected part within 100 hours of operation after receipt of ASB (locking washer can be removed while actuator still is installed on aircraft), or during the next scheduled overhaul, whichever occurs first. This modification obsoletes the 41000470-103 (212-076-005-105) configuration; actuators previously identified as such become 41000470-105 (212-076-005-111). Previous configurations show the modification on the modification plate. Refer to Table 1 for comprehensive list of changes to various configurations.

D. Approval

HR Textron Engineering:



E. Manpower

Approximately one man-hour will be required to inspect each shipset. An additional one hour will be required to replace locking washers, if not accomplished during next scheduled overhaul.

F. Material – Cost and Availability

Only one new item (locking device) is necessary to implement this service bulletin, although some operators could need as many as three additional items. Replacement locking devices are commonly available through standard suppliers, and also can be ordered from HR Textron or Bell Helicopter. Decal (212-076-121-111) is needed only to operators with the 41000470-103 (212-076-005-105) configuration. Decal is available from HR Textron or Bell Helicopter. Some operators also may require identification plate (41003213 or 41000746) and/or modification plate (48088996-001), available only from HR Textron. Contact HR Textron at: 25200 W. Rye Canyon Road, Santa Clarita, CA 91355-1265; (phone) 661-702-5509; or (fax) 661-702-5970. Contact Bell Helicopter at one of the following phone numbers:

United States: 817-280-2919 or (after hours) 817-280-2551

Canada: 403-275-3555

Netherlands: 31-20-449-6500

Singapore: 65-542-2422

G. Tooling

Not affected.

H. Weight and Balance

Not affected.

I. Electrical Load Data

Not affected.

J. References

67-31-06, Component Maintenance Manual with Illustrated Parts List (for) Flight Control Cylinder Assembly 212-076-005 (Bell) and 41000470 (HR).

K. Other Publications Affected

The intent of this ASB will be incorporated into the next revision of 67-31-06.

2. Accomplishment Instructions

A. Within 25 hours of receiving ASB, inspect locking washers NAS513-6 as follows:

- (1) Without removing actuator from aircraft, gain access to locking washer (Figure 1).
- (2) Visually inspect locking washer to ensure it is not broken. Tab shall be in groove of rod end assembly. Immediately replace any locking washer whose tab is twisted or hanging askew.

CAUTION: IMPROPER TORQUE TECHNIQUE CAN DESTROY TAB ON LOCKING WASHER. ROD END ASSEMBLY MUST BE HELD SECURE TO PREVENT UNDUE STRESS TO TAB.

- (3) Using two wrenches to protect locking washer from damage resulting from inadvertent rotation of rod end, verify torque of jam nut NAS509-6 as instructed below. Torque shall be 200 to 250 inch-pounds.
 - (a) Cut and remove lockwire from between jam nut and locking washer.
 - (b) Ensure that tab on locking washer is engaged into nearest radially located slot in end of piston.
 - (c) Use one wrench to hold and secure rod end assembly while using second wrench to tighten jam nut 200 to 250 inch-pounds. Do not use first wrench to hold piston assembly and turn jam nut with second wrench, as is the typical convention. This method may catch and turn the rod end, which strips the tab from the locking washer.
 - (d) Visually inspect locking washer to ensure it was not damaged during torque operation. Tab shall be in groove of rod end assembly. Immediately replace any locking washer whose tab is twisted or hanging askew.
 - (e) Apply lockwire MS20995C32 per MS33540 between jam nut and locking washer.

B. Within 100 hours of receiving ASB, replace locking washers NAS513-6 as follows:

- (1) There are two options to replace the washer: with actuator in place on aircraft; or with actuator off aircraft during shop overhaul. If replacing during overhaul, refer to CMM 67-31-06 and use locking device NAS1193K6C in place of locking washer NAS513-6. If replacing with actuator on aircraft, proceed as follows:
- (2) Disconnect rod end assembly from aircraft attachment point.
- (3) Bottom piston in cylinder, then measure dimension from centerline of rod end assembly to centerline of pivot point for input lever assembly (Figure 1). Record dimension for later use.
- (4) Cut and remove lockwire from between jam nut and locking washer.

- (5) Use one wrench to hold flats of rod end assembly. With rod end assembly thus secured, use second wrench to loosen jam nut.
- (6) Remove rod end assembly from threads of piston assembly. Remove locking washer from rod end assembly and discard locking washer.
- (7) Carefully install new 2-piece locking device NAS1193K6C onto rod end assembly. Refer to Figure 1 and the following substeps:
 - (a) Install round ring onto threaded rod so that tab fits into groove on rod end and serrated side faces away from jam nut.
 - (b) Install oblong ring onto threaded rod so that serrated side will engage serrated side of round ring.
- (8) Install rod end assembly into threads of piston assembly. With piston assembly bottomed in cylinder assembly, establish the same dimension that was recorded in step 3.
- (9) Slide oblong ring (part of new locking device NAS1193K6C) so that two locking tabs fit into slots on end of piston assembly. Slide round ring (also part of new locking device NAS1193K6C) to engage oblong ring.

CAUTION: IMPROPER TORQUE TECHNIQUE CAN DESTROY TAB ON LOCKING DEVICE. ROD END ASSEMBLY MUST BE HELD SECURE TO PREVENT UNDUE STRESS TO TAB.

- (10) Using two wrenches to protect locking device from damage resulting from inadvertent rotation of rod end, apply torque of 200 to 250 inch-pounds to jam nut NAS509-6. Use one wrench to hold and secure rod end assembly while using second wrench to tighten jam nut. Do not use first wrench to hold piston assembly and turn jam nut with second wrench, as is the typical convention. This method may catch and turn the rod end, which strips the tab off the locking device.
- (11) Visually inspect locking washer to ensure it was not damaged during torque operation. Tab shall be in groove of rod end assembly. Immediately replace any locking washer whose tab is twisted or hanging askew.
- (12) Identify actuator as being service bulletin-compliant. Refer to Table 1 for identification instructions and follow steps below as applicable:

NOTE: If locking washer is replaced while actuator still is installed on aircraft, existing identification plate can be reused only if new number is legible after actuator is reidentified. If existing identification plate is reused, it must be replaced at next overhaul with a new identification plate (part number 41003213 on all actuators except the 41000470-005, which uses identification plate 41000746).

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- (a) Carefully remove identification plate, taking care to avoid breaking metal strap which can become brittle. Use metal impression stamp to change two dash numbers: change 41000470 from -103 to -105, and change 212-076-003 from -103 to -109. Reinstall identification plate.
- (b) Carefully remove modification plate 48088996-001, taking care to avoid breaking metal strap which can become brittle. Use metal impression stamp to add service bulletin number (67A-05) onto new or existing modification plate 48088996-001.
- (c) With modification plate off, access is provided to decal 212-076-121-105. Only if Bell configuration 212-076-005-105 is changing to 212-076-005-111, peel off existing decal and replace it with new decal 212-076-121-111.

NOTE: Step (c) does not apply to Bell part number 212-076-005-103, even though it contains modified HR part number 41000470-105. The Bell -103 and -105 configurations have different mounting brackets.

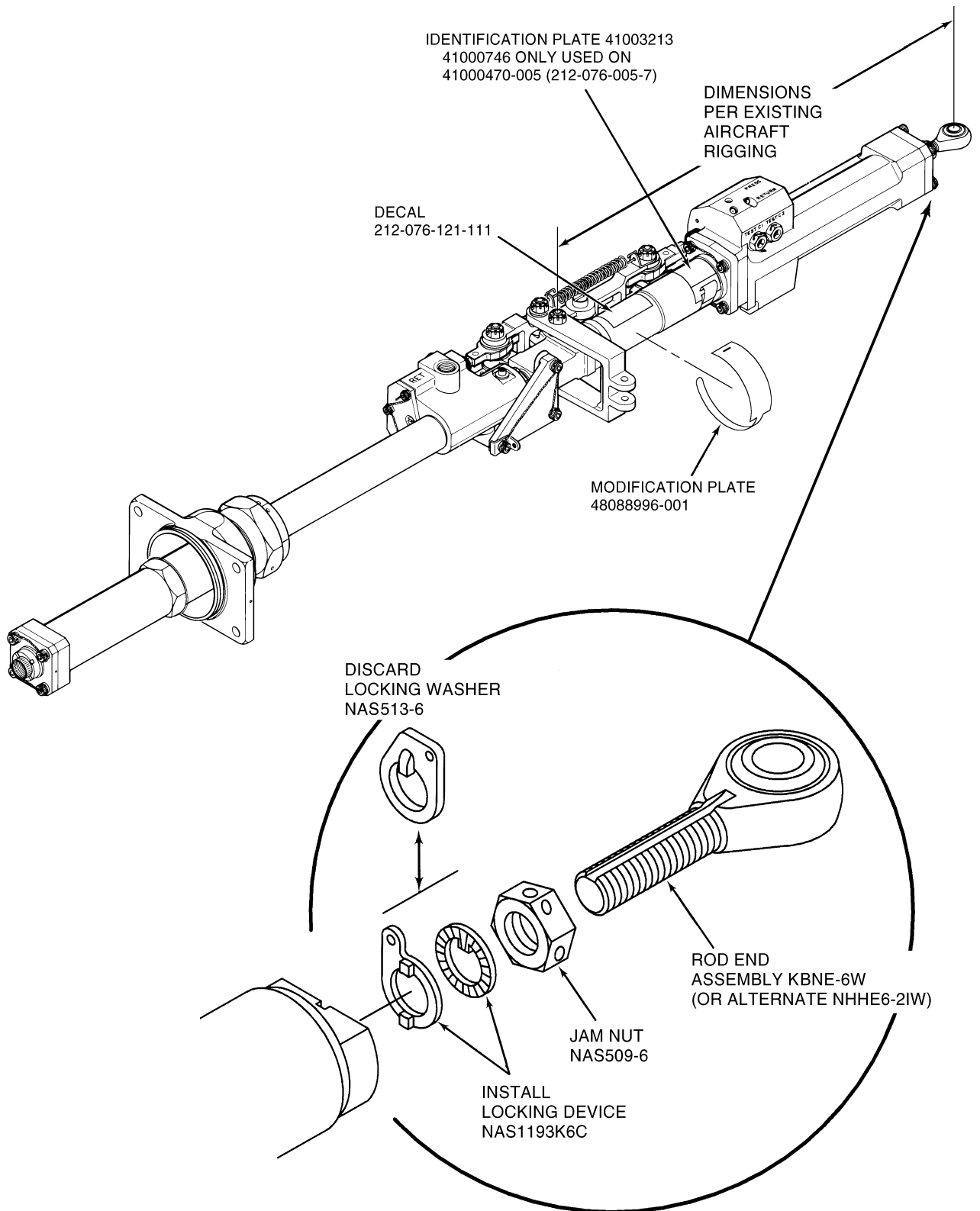
- (d) Reinstall modification plate.

(13) Reconnect rod end assembly to aircraft attachment point in accordance with applicable Bell manual(s).

(14) Apply lockwire MS20995C32 per MS33540 between jam nut and locking device.

Table 1. Identification Data

Before Modification		After Modification		Physical Effects to Actuator
HR Textron Part Number	Bell Helicopter Part Number	HR Textron Part Number	Bell Helicopter Part Number	
41000470-005	212-076-005-7	41000470-005	212-076-005-7	Lock replaced & modification plate stamped
41000470-009	212-076-005-9	41000470-005	212-076-005-7	
41000470-011	212-076-005-11	41000470-011	212-076-005-11	
41000470-013	212-076-005-101	41000470-013	212-076-005-101	
41000470-103 (212-076-003-103)	212-076-005-103	41000470-105 (212-076-003-109)	212-076-005-103	Lock replaced & modification plate stamped; configuration changed for HR, but not for Bell *
41000470-103 (212-076-003-103)	212-076-005-105	41000470-105 (212-076-003-109)	212-076-005-111	Lock replaced & modification plate NOT stamped; configuration changed for both HR and Bell *
* Decal 212-076-121-111 replaces 212-076-121-105 only when Bell configuration changes				



Locking Washer Inspection Area

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Figure 1

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FLIGHT CONTROLS – HYDRAULIC SERVO ACTUATOR INSPECTION FOR DAMAGED LOCKING WASHER

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- This copy for review only
 - This copy for signatures (all comments have been incorporated)
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	SIGNATURE	DATE
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