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ARMY AVIATION TEST BOARD FORT RUCKER ALA  
PRODUCT IMPROVEMENT TEST OF IMPROVED AH-1G PITCH-LINK TUBE ASSE--ETC(U)  
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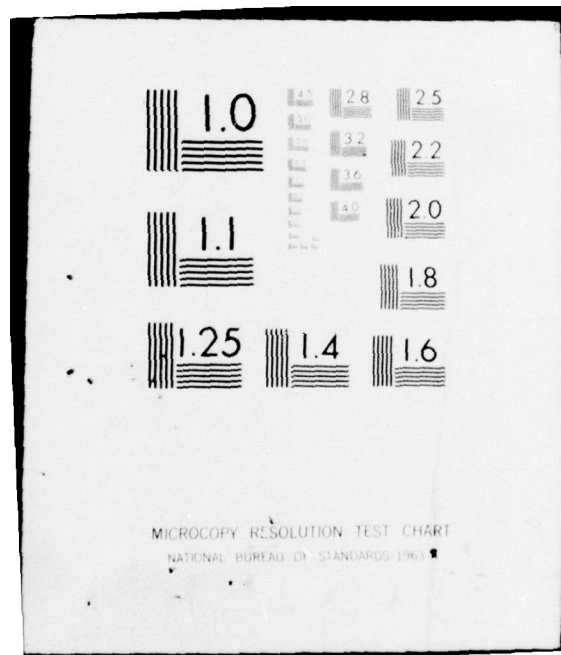
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DEPARTMENT OF THE ARMY  
UNITED STATES ARMY AVIATION TEST BOARD  
Fort Rucker, Alabama 36360

16 USATECOM-4-6-0500-11

STEBG-TD

SEP 30 1968

SUBJECT: ~~Final Report of Test~~, Product Improvement Test of Improved AH-1G  
Pitch-Link Tube Assembly, USATECOM Project Number 4-6-0500-11

⑨ Final rept.,

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1. REFERENCES

⑪ 30 Sep 68

⑫ 5p.

a. Letter, AMCPM-IRFO-T, US Army Materiel Command Field Office, 16 January 1968, subject: "Product Improvement Test on Improved Pitch Link Tube Assembly," with 1st Indorsement, AMSTE-BG, Headquarters, US Army Test and Evaluation Command, 24 January 1968.

b. Letter, AMCPM-IR-T, US Army Materiel Command Field Office, 23 August 1968, subject: "Termination of Test Projects."

2. BACKGROUND

a. An excessive amount of wear and chafing has been experienced on standard AH-1G Helicopter pitch-link tube rod end antirotation lugs, bearing assemblies, and the surface of the scissors assembly. This wear, necessitating replacement of the assemblies after approximately 250 hours of operation, is attributed to the torsional loads imposed on the pitch-link tubes and to misalignment of the assembly.

b. In an effort to reduce or eliminate this wear, Bell Helicopter Company manufactured an improved pitch-link tube assembly and modified the scissors assembly. This proposal was submitted to the Iroquois Project Manager as an Engineering Change Proposal (ECP). The Project Manager desired actual test time on the item prior to approving the ECP.

c. On 24 January 1968 the US Army Test and Evaluation Command directed the US Army Aviation Test Board (USAAVNTBD) to conduct a product improvement test of the improved pitch-link tube assembly (reference a).

3. DESCRIPTION OF MATERIEL

a. The improved pitch-link tube incorporates a lower rod end containing two roller bearing assemblies at the scissors attaching end, which eliminates the antirotation lugs and improves the alignment of the assembly. The roller bearings replace the standard Teflon-surfaced bearings and must be lubricated through four grease fittings.

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b. The modification of the scissors consists of a different bushing in the scissors clevis, in order to accommodate the pitch-link tube bearings. Photographs of the test items are attached as Inclosure 1.

#### 4. OBJECTIVE

To determine whether wear and chafing are reduced or eliminated by an improved AH-1G pitch-link tube assembly and modified scissors assembly.

#### 5. SCOPE AND METHOD

The USAAVNTBD conducted this Category II product-improvement test at Fort Rucker, Alabama. On 21 January 1968 the test items were installed on AH-1G Helicopter, serial number 66-15257. After accumulating 302 test flight hours, they were removed and installed on AH-1G serial number 66-15355. The helicopters were operated in accordance with profiles established for AH-1G reliability testing, which included high speed gunnery runs with abrupt pull-up maneuvers. The test items were inspected in accordance with procedures outlined in TM 55-1520-221-20. The test was terminated on 30 August 1968 at the request of the Project Manager (reference b).

#### 6. SUMMARY OF RESULTS

a. The test items operated 648 hours without excessive wear or chafing on either the lower pitch-link tubes, bearings, or scissors assembly.

b. No unusual or difficult maintenance procedures were encountered during removal or installation of the test items. However, the improved pitch-link tube bearings required periodic lubrication whereas the standard pitch-link tube rod-end Teflon bearing did not require lubrication.

#### 7. DISCUSSION

Four standard rod-end bearings were replaced on the upper ends of the pitch-link tubes because of bearing wear during this test.

#### 8. CONCLUSION

The AH-1G improved pitch-link tube assembly and modified scissors assembly are a significant improvement over the standard items because of the reduced wear on the pitch-link tube assembly and the elimination of chafing on the scissors assembly.

#### 9. RECOMMENDATIONS

It is recommended that:

a. The ECP for the improved pitch-link tube assembly and modified scissors assembly for AH-1G Helicopters be approved.

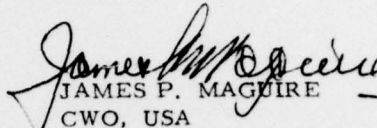
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b. Efforts be continued to improve the reliability of the pitch-link tube upper rod-end bearings.

FOR THE PRESIDENT:

1 Inclosure  
as

  
JAMES P. MAGUIRE  
CWO, USA  
Acting Adjutant

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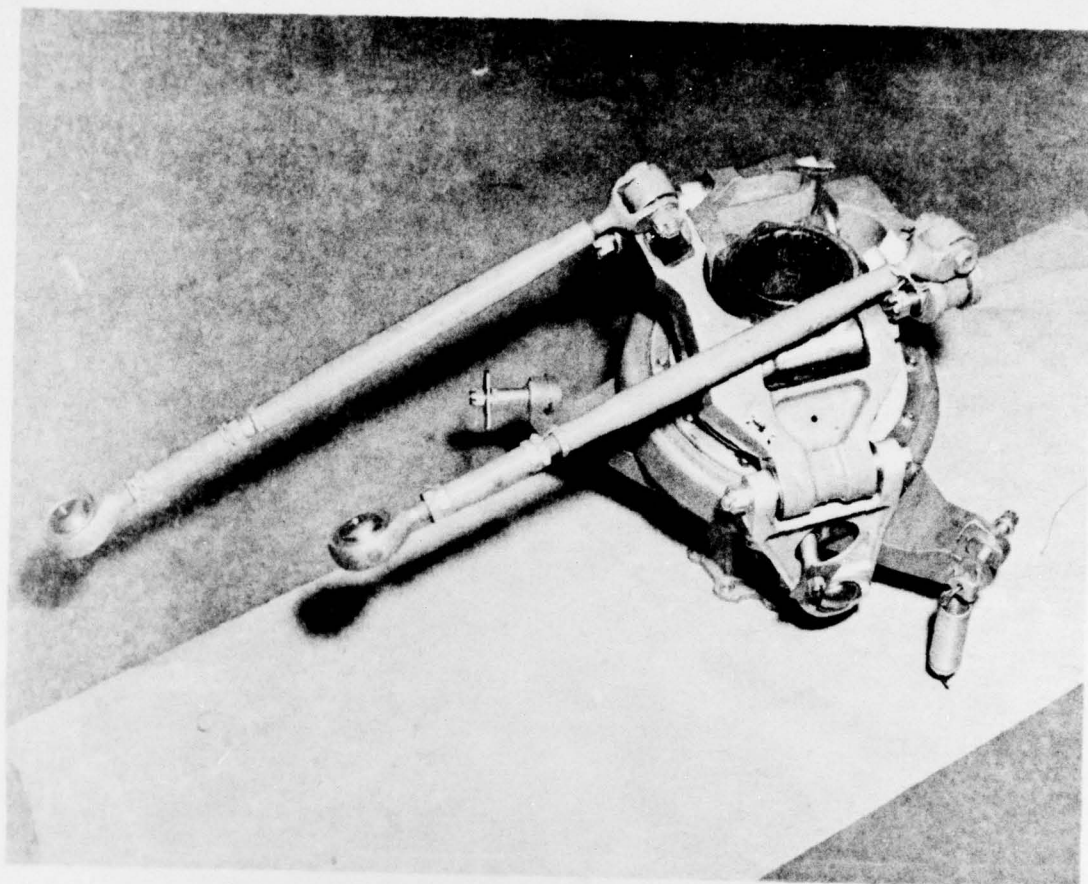


Figure 1.

INCLOSURE 1



Figure 2.