UNCLASSIFIED [redacted] 0481

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
1st Review Date: 7/6/98
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Name: B Craner
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Authority: ADD
Name: W Layne
Determination (Circle Numbers)
1. Classification Retained
2. Classification Changed to: UNCL
3. Contains No DOE Classified Information
4. Coordinate With
5. Contains UCNI: NO
6. Comments: Declassify

AUG 4 1960

7-16910
Project No. 13,798.00
Completed: 6-18-60

TO: DISTRIBUTION

Re: Dynamic Force Measurements of the Removal of Pulloff Covers from MK-15, Mod. 2 and MK-39, Mod. 2 Bombs.

Summary

Measurements were made of the forces required to remove the pulloff covers from the two types of afterbodys during simulated weapon drop from aircraft. A portion of the Air Force clip-in suspension system was utilized to restrain the cover when either afterbody was dropped. The total combined force was less than 1200 lbs.

The items tested were cover assembly P/N 153869-01 with the MK-15, Mod. 2 afterbody and cover assembly P/N 153868-01 with the MK-39, Mod. 2 afterbody.

Object of Test

A design change to the aforementioned weapons resulted in the use of these pulloff covers to provide compatability with the use concept as applied to the aircraft clip-in suspension system. It was necessary that the force required to remove the covers be determined.

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Test Setup and Procedure

The afterbody with cover attached was suspended from an I-beam as shown in Fig. 1, but no load was applied to the clip-in system before the afterbody was dropped. The clip-in system was fastened to a static jig in a cantilever beam fashion. Flexibility of the cantilever was checked before the test. A 1200 lb. load applied to the free end of the cantilever produced a deflection of six in.

At release, everything suspended from the quick-release was dropped. As the afterbody dropped, the cover was restrained by four cables fastened to the clip-in cantilever. After the cover was pulled off, the afterbody landed on Insolite pads. A restraining cable prevented the I-beam from landing on the cantilever.

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Lead weights were used to ballast the afterbody. The total weight of the MK-15, Mod. 2 afterbody was 460 lbs; the MK-39, Mod. 2 afterbody, 450 lbs.

The cover (before pulloff) was held to the MK-15 afterbody by three shear blocks, and to the MK-39 afterbody by five shear blocks. The force required to pull the cover off was applied at four points on the cover. The force at each pull point was measured by a force link and was recorded on a

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[illegible] and a [illegible] of the four [illegible] [illegible].

[illegible] airbody was dropped [illegible]. [illegible] film coverage was utilized, for [illegible] in slow motion. Force-time relation- [illegible] were also recorded. The velocity of the [illegible] airbody at the start of [illegible] 9.6 fps as [illegible].

[illegible]

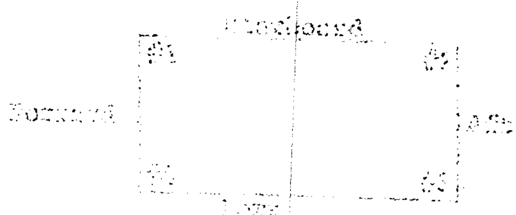
Table I lists the [illegible] and the maximum force occurring at each [illegible] point during the [illegible].

TABLE I

[illegible]

Drop No.	Airbody [illegible]	Maximum Force (lbs.) at [illegible] Point*					Elapsed Time of Max. Force from Impulse Start (msec)**			
		#1	#2	#3	#4		#1	#2	#3	#4
[illegible]	[illegible].2	227	[illegible]	213	205	473	26	12	8.5	27
[illegible]	[illegible].2	[illegible]	273	252	[illegible]	1044	12	20	10	6.5
[illegible]	[illegible].2	[illegible]	[illegible]	225	198	926	46	37	62	39
2	[illegible].2	[illegible]	[illegible]	[illegible]	[illegible]	1014	[illegible]	[illegible]	9.3	59

*[illegible] point designation is shown in following sketch:



**[illegible] impulses started within a 10 ms interval.

[illegible] the [illegible], the total load on the [illegible] cantilever [illegible]-in suspension system [illegible] lbs. at any one time.

[illegible] film indicated that all covers pulled off smoothly and cleanly. It was noted that the pullout valve [illegible] appeared to bounce back into the [illegible] position while the airbody was still falling.

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Conclusions

During the dynamic pushoff, the peak force at the pull points could occur in any sequence and the total applied force to the clip-in suspension system did not exceed 1100 lbs. even if the maximum peaks occurred simultaneously.

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Enc: Figures 1 & 2

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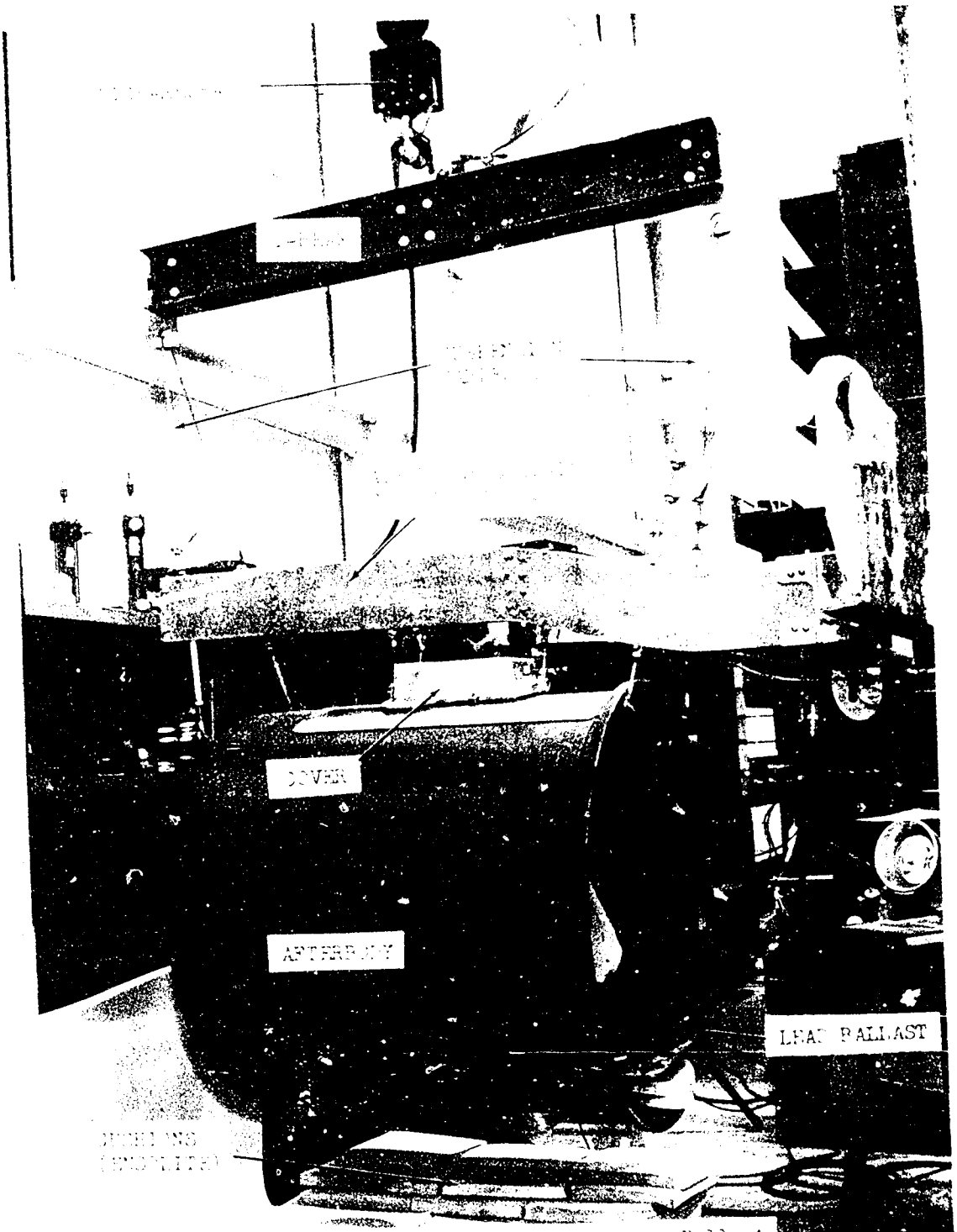

FIG. 1 - Test Set-up for Dynamic Cover Pullout

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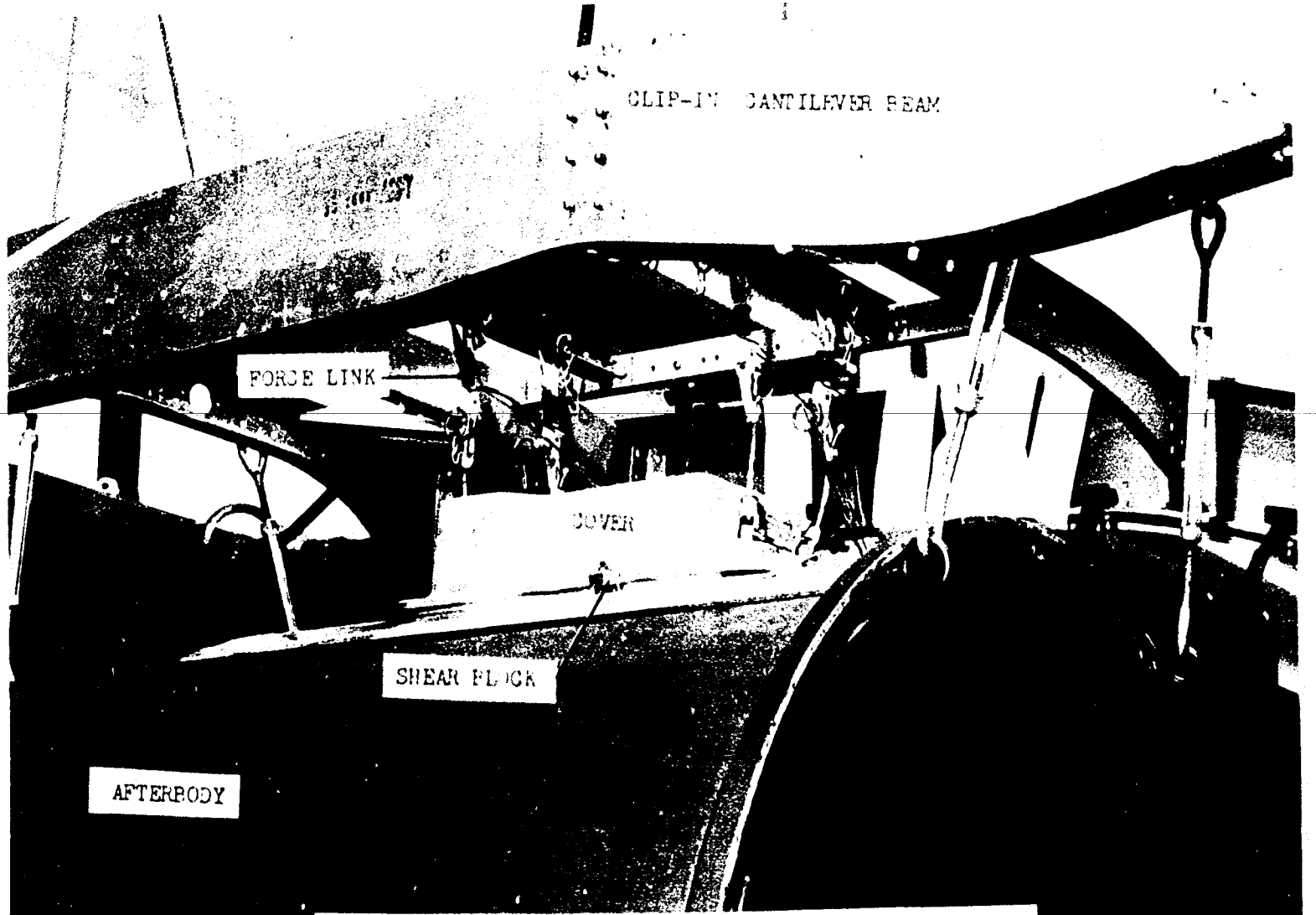

FIG. 2 - Closeup of Cover Attachment to Clip-in System

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