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T-12162 JUL 2 5 1967 File: XW-44

SHOCK TESTS OF A MOCKUP XW-44

Organization 7300 Environmental Test Report

RECEIVED
JUL 25 1967
CENTRAL TECH FILE

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TABLE OF CONTENTS

UNCLASSIFIED

T-12162

SHOCK TESTS OF A MOCKUP XW-44

Introduction

The purpose of this test was to determine the response characteristics of the XW-44 when subjected to a velocity change of 12 to 50 feet per second with a pulse duration of 1.5 milliseconds.

Two calibration tests were performed on a previously tested dummy inert case by applying the shock in the longitudinal direction.

The test was requested by L. H. Stratford, 1525, in an Environmental Test Request dated December 27, 1966. The tests were performed on January 27, 1967, and February 10, 1967. J. M. Carmichael, 7331 was the Test Coordinator.

Summary

Two calibration tests were performed on a dummy, inert, XW-44 case in preparation for actual testing of units containing live detonators. Circumferential failure in the nose area of the dummy case during the second test at 13.65 ft/sec (1300 g, 75 ms) resulted in cancellation of the live tests by the consultant.

Procedure and Results

The shock tests were performed on the 18-inch actuator located in the Area III test laboratory. A dummy XW-44 case was shocked twice in the longitudinal direction. A special fixture was used to hold the case in position for the shock. The velocity change was applied to the case through a crush material (attached to the nose of the unit) being impacted by a moving ram carriage. The crush material on Test 1 was a stirated aluminum ring 8 inchs in diameter, 1/8 inch thick. For Test 2, the crush material was an aluminum plate 1/4 inch thick. Figure 1 is a sketch of the overall test setup showing the ram carriage, holding tube, test case, and accelerometer location. Figures 2 and 3 show the strain gage locations and failure area. Figure 4 shows a closeup of the case in the tube.

Since the two tests performed were in preparation for the units with live detonators, only partial results were obtained. Table I shows the response of Accelerometer AI and two strain gages on test No. 1.

On test No. 2, Accelerometer AI was subjected to an approximate haversine pulse of 1300 g with a duration of .75 millisecond. Ram carriage velocity for both tests was approximately 19.4 feet per second and the case velocity after impact was approximately 13.65 feet per second.

Because of the unanticipated failure at this low level, the consultant choose to terminate testing.

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TABLE I

TEST NO. 12162

TEST CONDITIONS

ACTUATOR SETUP

FIRE PRESSURE 305 PSI
CUSHION PRESSURE 150 PSI
SET PRESSURE 150 PSI

LEGEND

PD - PULSE DURATION
RT - RISE TIME
MFP - MAXIMUM FIRED PULSE
A - ACCELEROMETER

TRANSDUCER INFORMATION TEST NO. I

No.	Location and Orientation	Model	S/N	Sc and Range	Pic. Rel.	Max. (+)	Max. (-)	MFP	RT (ms)	PD (ms)
A-1	XW44, LONG.	2225M2 ENDEVCO	JC24	80KHz 16,000g	1	1650	1075	700	.09	0.85
2R	XW44 RADIAL	STRAIN GAUGE			2	1700	μIN./IN.			0.95
2L	XW44 LONG.	STRAIN GAUGE			2	4800	μIN./IN.			1.0

CALIBRATE

1800 g

4400 μIN./IN.

9800 μIN./IN

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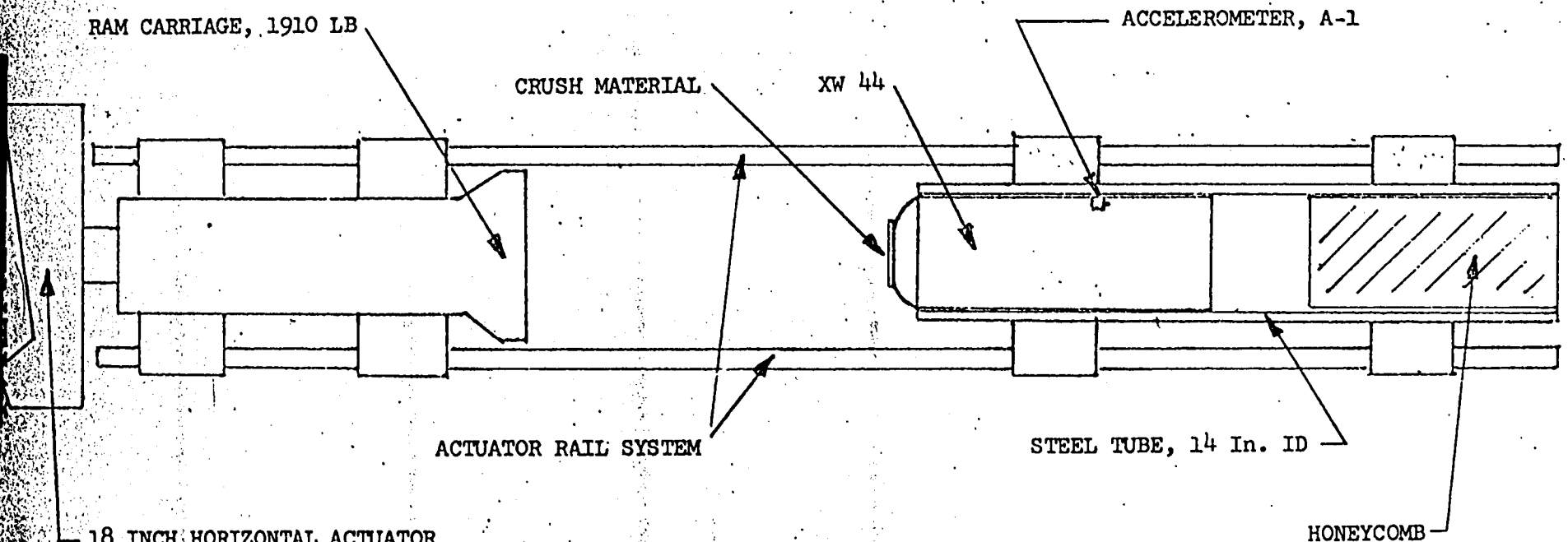

FIGURE 1. TEST SETUP FOR MECHANICAL SHOCK TEST OF XW44.

T-12162 0832

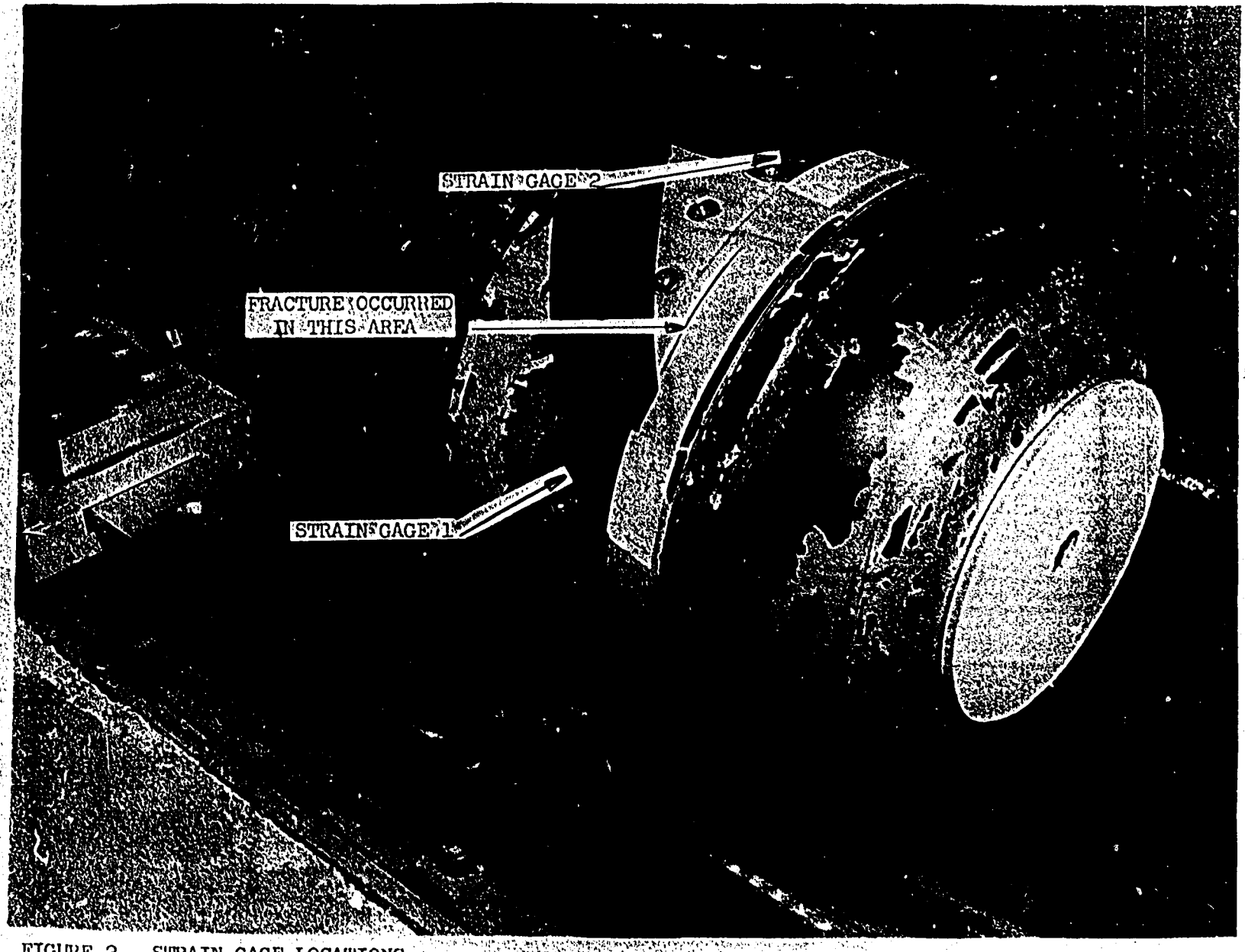

FIGURE 2. STRAIN GAGE LOCA"IONS.

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T-12162

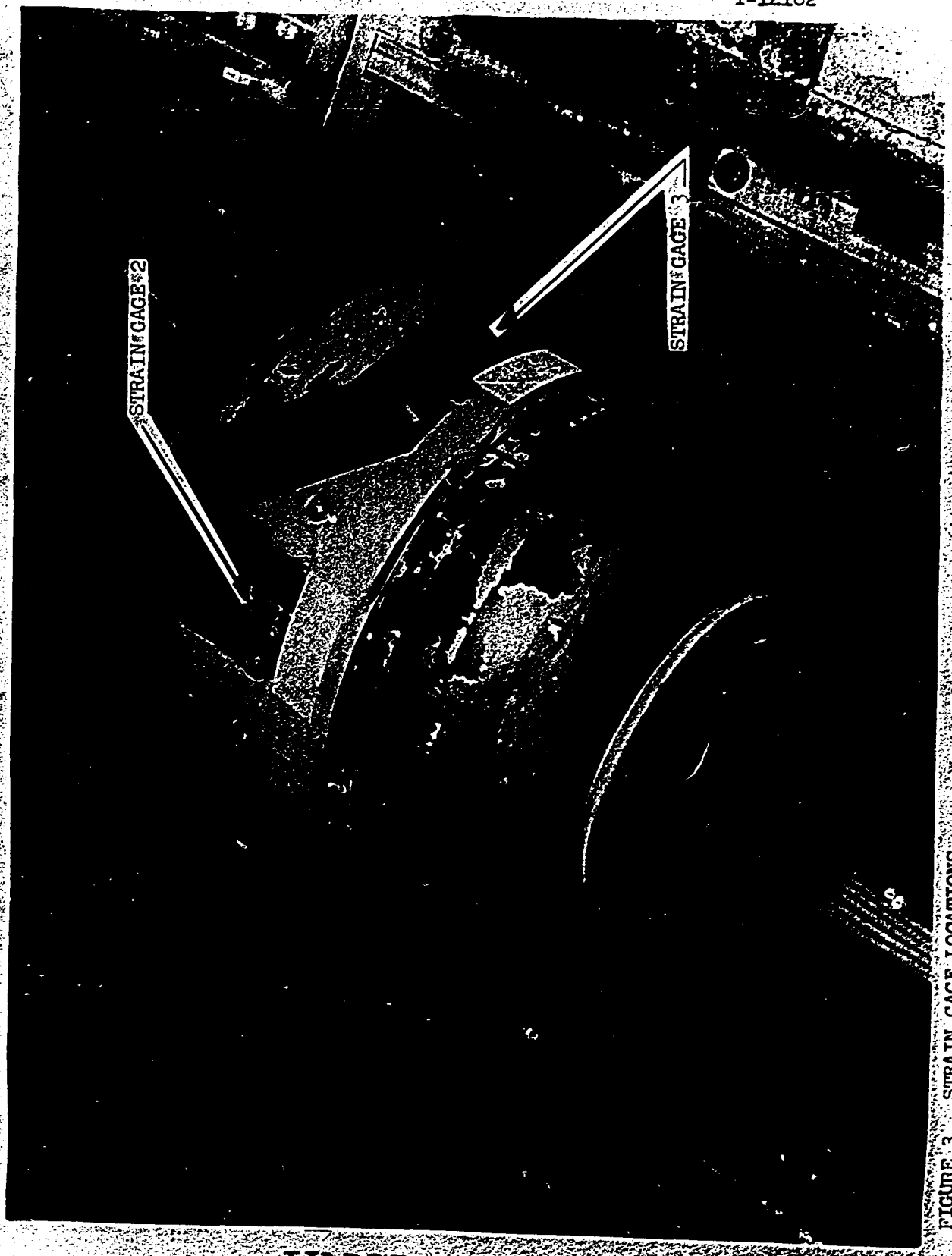

FIGURE 3. STRAIN GAGE LOCATIONS.

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T-12162

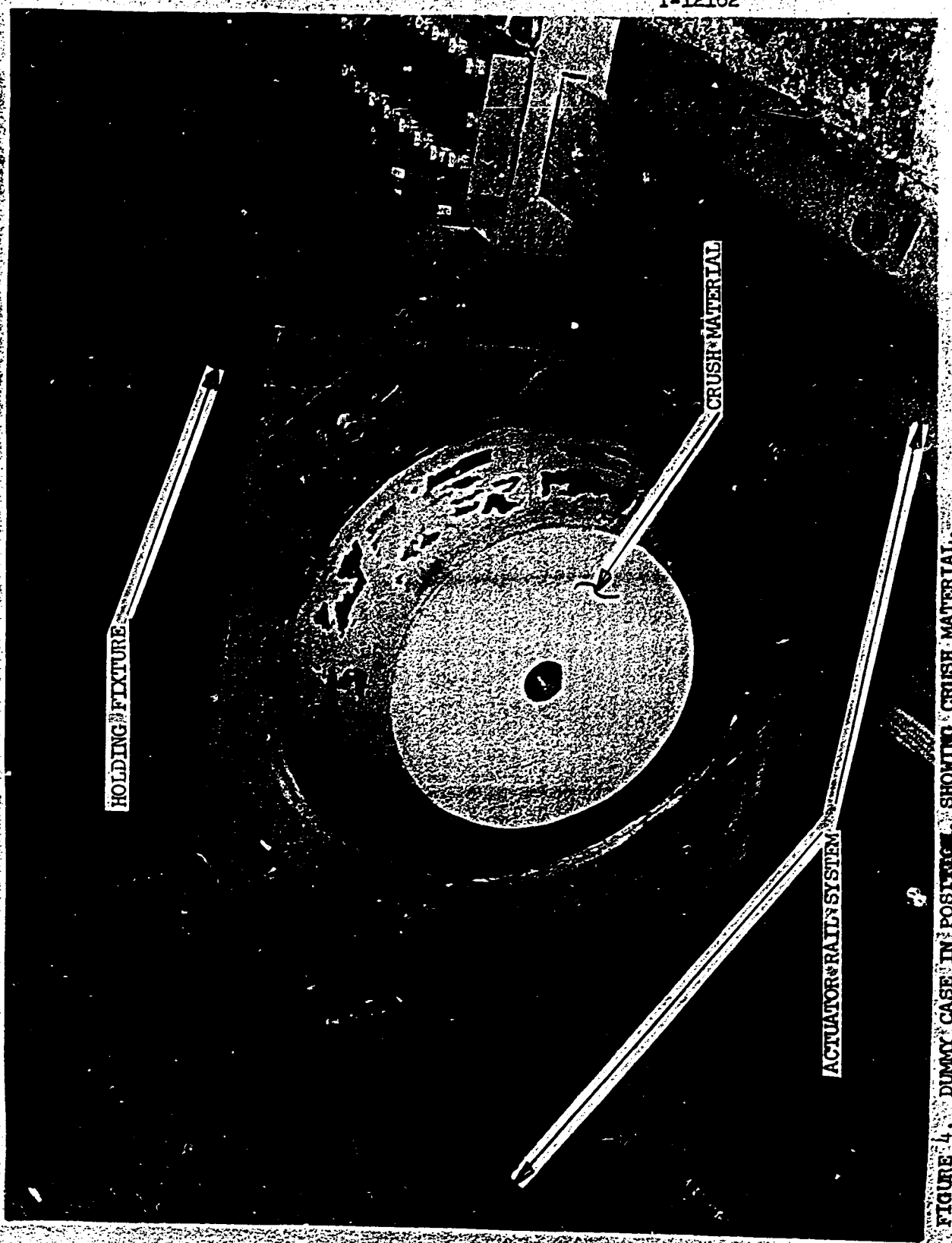

FIGURE 4. DUMMY CASE IN POSITION SHOWING CRUSH MATERIAL.

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