

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW

1 st Review Date: 5/22/98	Classification (Circle Number):
Authority: ADD	1. Classification Retained
Name: P. Blum	2. Classification Changed to: UNCL
2 nd Review Date: 6/01/98	3. Contains No DOE Classified Information
Authority: ADD	4. Coordinate With:
Name: W. C. Payne	5. Contains UCAIT
	6. Comments:

W. C. Payne

Z-49-4, 3.2
T-17160
13.784.19

MAY 5 1961

TO: DISTRIBUTION

Re: Static Test of Modified Aft Container for W-49-4 Jig

Summary of Test

The aft container of the centrifuge jig was modified to accommodate the change in flare section shape and was statically tested prior to centrifuge testing. The aft container was tested under re-entry condition I to 1.375 times limit load and re-entry condition II to 1.10 times limit load. No failures or yielding were noted in the aft container in either test. However, the threaded joint between section "B" and the flare section failed at approximately 100% load (1.10 x limit load) in the re-entry II test. The flare section and section "B" were being used as test fixtures and were not themselves being tested.

Object of Test

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The object of this test is to prove the structural adequacy prior to centrifuge testing of the aft container of the centrifuge jig. The aft container had been modified to accommodate the change in flare section from a truncated cone to a Bi-conic configuration.

CENTRAL RECORD FILE

Two re-entry conditions were simulated; re-entry I (Max. load was 1.375 times limit load) and re-entry II (Max. load was 1.10 times limit load).

Authorization for Test

The test was authorized in a Work Order Authorization from Mr. J. J. Kane, 7145, to Mr. B. Williams, 1613, dated July 27, 1960. The consultant was Mr. J. B. Smith, 714-1.

Test Equipment and Instrumentation

The item tested was the modified aft container of the W-49-4 centrifuge jig. (Dwg. No. 12730). The items that were being used as test fixtures and failed in the test were the aft threads of section "B" (Dwg. No. 2175379F2) and the G. E. Ring (Dwg. No. 2175379F2) which is part of the flange (Dwg. No. 198R14501).

Equipment Used

- Seven Baldwin ER-5 Indicators, Serial Nos. J-59101, 442651, 442662, 391905, 392498, J-92499, J-59191.

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DOWNGRADING OR DECLASSIFICATION STAMP

CLASSIFICATION CHANGED TO: U	AUTHORITY: W. C. Payne
PERSON CHANGING MARKING & DATE: Emelda Selph 6/10/98	RECORD ID: 98SN2201
PERSON VERIFYING MARKING & DATE: W. C. Payne 6-15-98	DATED: 6/01/98

W. C. Payne

XW-49
3-2

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2. Four Baldwin SR-4 Load Cells, 20,000 lb. capacity, Serial Nos. 2245, 2398, 2392 and 2246
3. Seven calibrated load links
4. Two Simplex 60 ton Rams
5. Three Simplex 30 ton Rams
6. Two Blackhawk $7\frac{1}{2}$ ton Rams
7. Two 4 inch Bore Hydraulic Cylinders
8. One 6 inch Bore Hydraulic Cylinders
9. One 7 inch Bore Hydraulic Cylinders
10. One oilgear Load Maintainer

Procedure

The centrifuge jig with the modified aft container attached was mounted in the static jig. The W-49-A flange section was placed in the aft container and the W-42-A section "B" was mated to the flange section. (See Fig. 1).

As-entry 1 Condition

One load was applied to the W-49-A and one load and one reaction were applied directly to the aft container simultaneously.

A longitudinal load of 66,100 lbs. (F_1) was applied to the aft container through the W-49-A by means of a pull bar connected into the forward end of section "B" at the location and in the direction shown in figures 1, 2, and 3.

A longitudinal load of 27,200 lbs. (F_2) was applied directly to the aft container divided equally between two loading points. The location and direction of the loading points is shown in figures 2 and 4.

Two reaction loads (R_1) of 48,000 lbs. each were applied in the longitudinal direction to the aft container through the counterweight lever system. The locations and directions of the reactions that were applied to the aft container are shown in figures 2, 4, and 5.

Visual observations were made of the aft container during loading to see if there were any failures or yielding.

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Re-entry II Condition

The same basic test setup that was used for Re-entry I condition was used for Re-entry II condition with the exception that two lateral loads were applied to section "B" and one lateral load was applied directly to the aft container. The remaining loads except for magnitude that were applied in the Re-entry I condition were also applied for Re-entry II.

A lateral load (P_4) of 33,400 lbs. was applied to the aft container through a load pad at a point 27.9 inches aft of the joint between section B and the flare section (See Figs. 6 & 7 for direction and location of load).

A lateral load (P_6) of 44,000 lbs. was applied by means of a load strap to section "B" at a point 8 inches forward of the joint between section "B" and the flare section (See Figures 1 and 6 for direction and location of load).

A lateral load (P_5) of 27,828 lbs. was applied through a load pad to section "B" at a point 34 inches forward of the joint between section "B" and the flare section. (See Figures 1 and 6 for direction and location of load).

A longitudinal load (P_1) of 31,700 lbs. was applied to section "B" by means of a pull bar screwed into the forward end of section "B". (See Figures 1, 3, and 6 for direction and location of load.)

A longitudinal load (P_2) of 8780 lbs. was applied at two points (each point 4390 lbs.) to the aft container at the location and in the direction shown in figures 4 and 6.

Two reaction loads (R_1) of 20,240 lbs. each were applied in the longitudinal direction to the aft container through the counterweight lever system. The locations and directions of the reactions that were applied to the aft container are shown in figures 4, 5, and 6.

Two reaction loads (R_2) of 19325 lbs. each were applied in the lateral direction to the centrifuge jig frame at a point 67 inches aft of the joint between section "B" and the flare section. The locations and directions of the reactions that were applied to the centrifuge jig frame are shown in figures 1 and 6.

Visual observations were made on the aft container during loading to see if there were any failures or yielding.

Results

The modified aft container of the N-49-4 centrifuge jig was statically tested to prove it structurally adequate for the centrifuge test. The aft

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container was tested to 1.375 times limit load for the Re-entry I condition and 1.10 times limit load for the Re-entry II condition.

The modified aft container of W-49-4 centrifuge jig withstood 1.375 time limit load when statically tested in the re-entry I condition with no signs of failure or yielding. The magnitudes, directions, and location of the loads applied are listed on figure 2.

The aft container of the W-49-61 centrifuge jig was tested to approximately 1.10 times limit load when tested in the Re-entry II condition. There were no failures or yielding noted in the aft container. However, the threaded joint between the flare section and section "B" failed at approximately 100% load (1.10 times limit load). See figures 8 and 9 for photographs of the failure. The flare section and section B were not being tested but were being used as test fixtures.

The magnitudes of the loads and reactions that were applied at the time of failure are listed below.

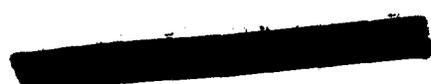
<u>Load Designation</u> <u>(See Fig. 6)</u>	<u>lbs.</u>	<u>Percent of Total</u> <u>Load (1.10 X Limit Load)</u>
P ₁	31,400	99
P ₂	4390 (each)	100
P ₃	33,330	99.9
P ₄	29,760	100.7
P ₅	41,800	98
P ₁	18,400 (each)	90.9
P ₂	17,400 (each)	95

The directions, magnitudes and location of loads that were to be applied to the aft container are shown in figure 6.

CONCLUSION

The modified aft container for the W-49-4 centrifuge jig was structurally adequate to withstand the required 1.375 times limit load when statically tested.

The aft container of the W-49-61 centrifuge jig was structurally adequate to withstand the required 1.10 times limit load when statically tested.



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stood the required loads for re-entry condition II if the test fixtures had not failed.

L. J. Woolrich

L. J. WOOLRICH - 7322-1

Bill Johnson

7321 PROJECT ENGINEER: BILL JOHNSON - 7321-5

R. S. Hooper

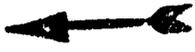
APPROVED BY: - - - - - R. S. HOOPER - 7321-3

LJW:7322-1map

Enc: Figs. 1-9

Distribution:

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Attn: Carl Sprague
- J. M. Wizen, 1442
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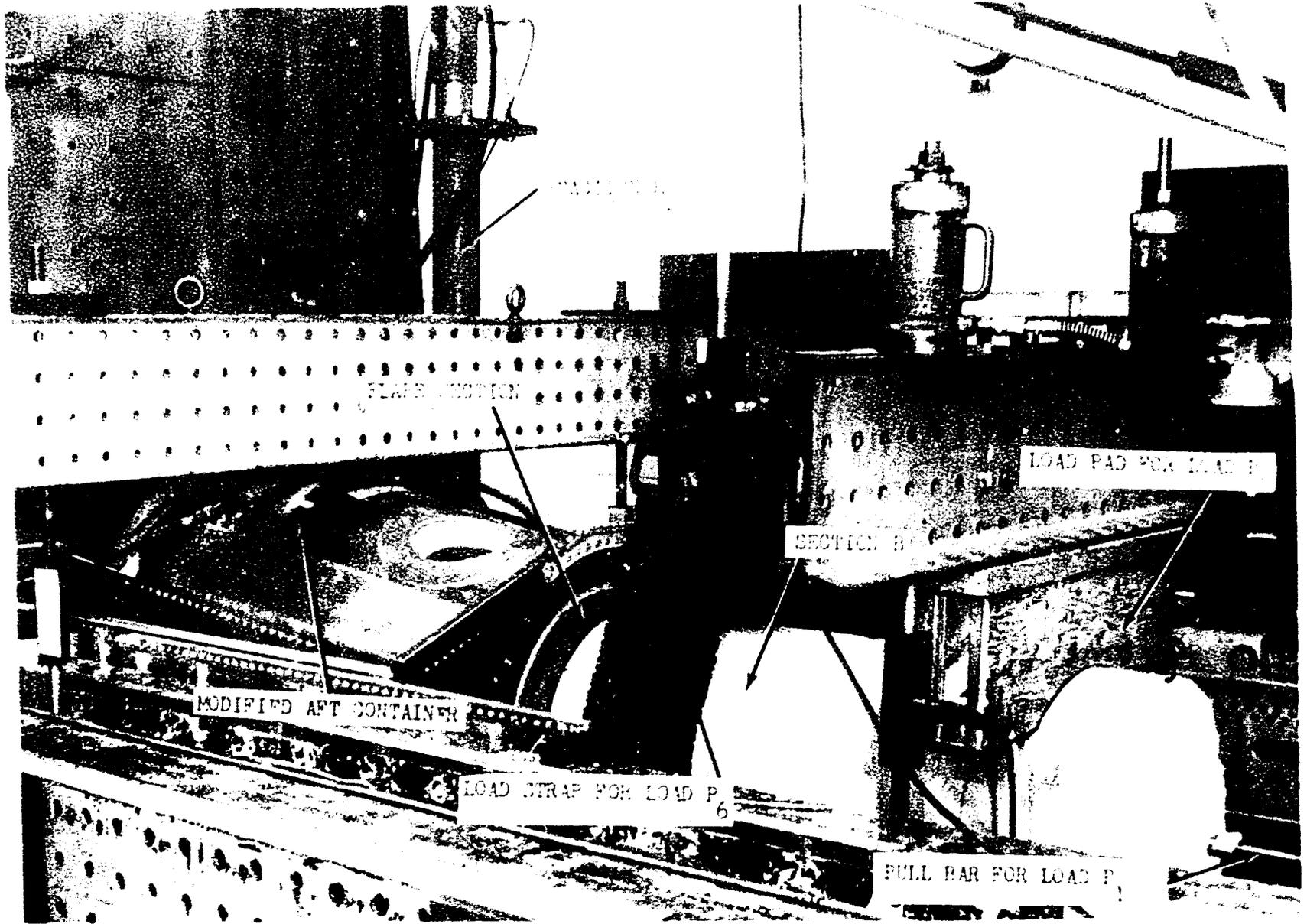
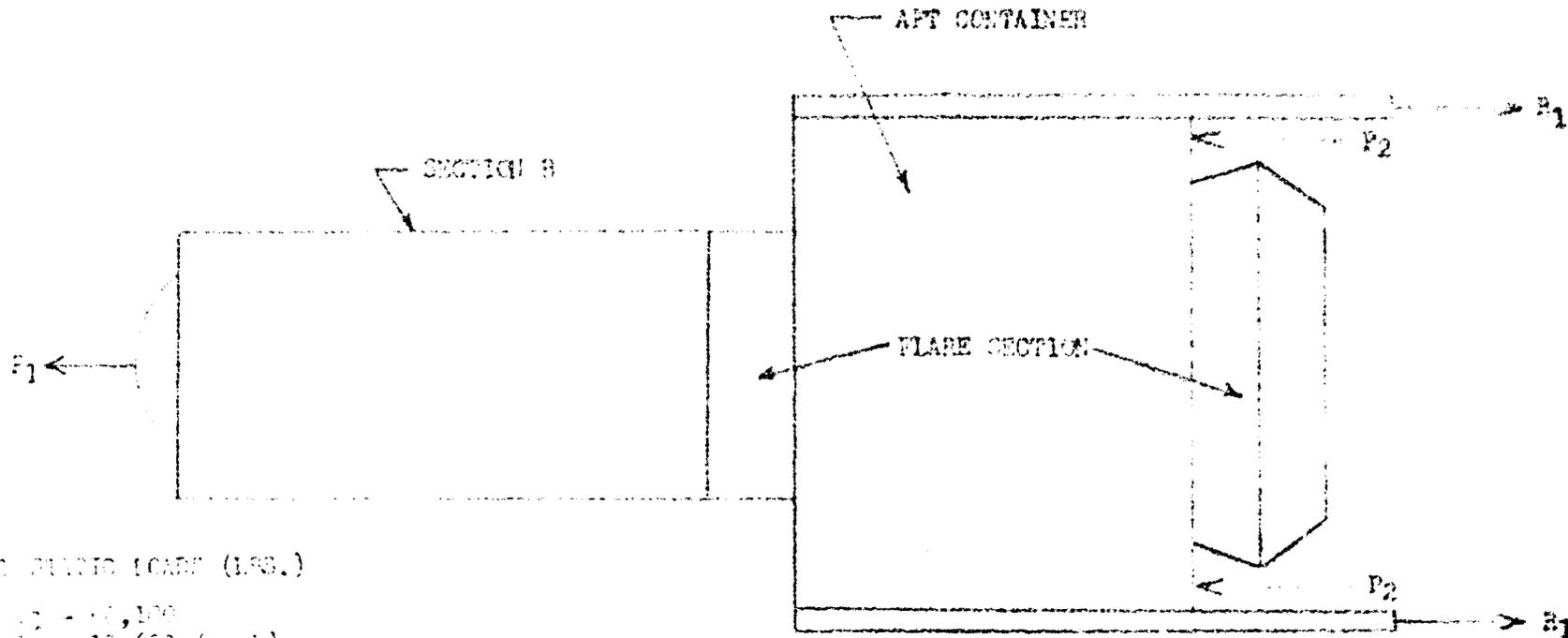


FIG. 1 - TEST RIG - STATIC LOAD OF MODIFIED APT CONTAINER FOR 1/2-1/2 IN.

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MAXIMUM STATIC LOADS (LBS.)

- P_1 - 46,100
- P_2 - 13,000 (each)
- R_1 - 46,650 (each)

TOP VIEW

FIG. 2 - DIRECTIONS AND MAGNITUDES OF LOADS AND REACTIONS FOR RE-ENTRY CONDITION 1 - STATIC TEST OF MODIFIED AFT CONTAINER FOR W-49-4 JIG.

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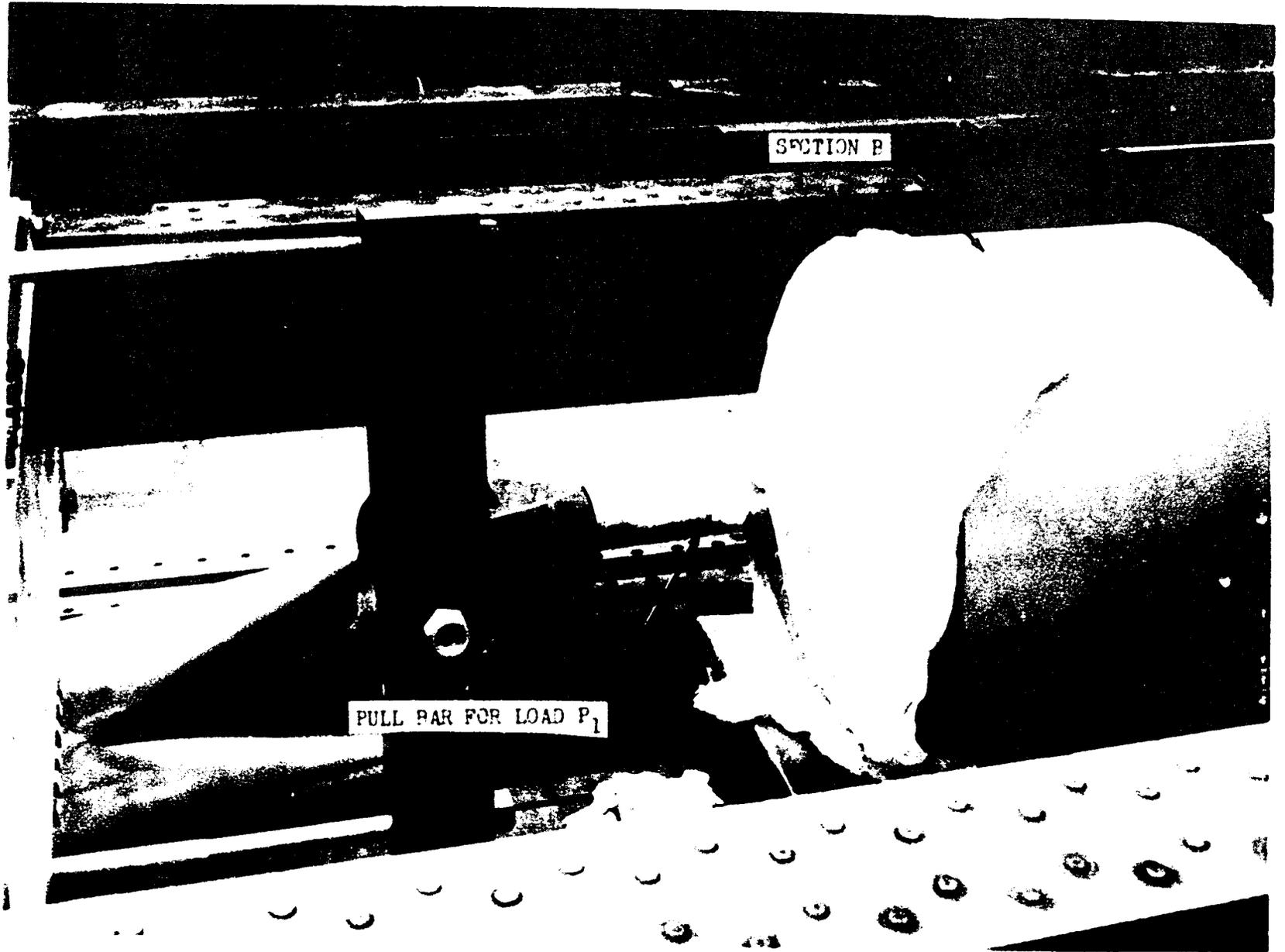


FIG. 2 - TEST SETUP -- DYNAMIC TEST OF MODIFIED AND ORIGINAL 100 W-70-A WIG.

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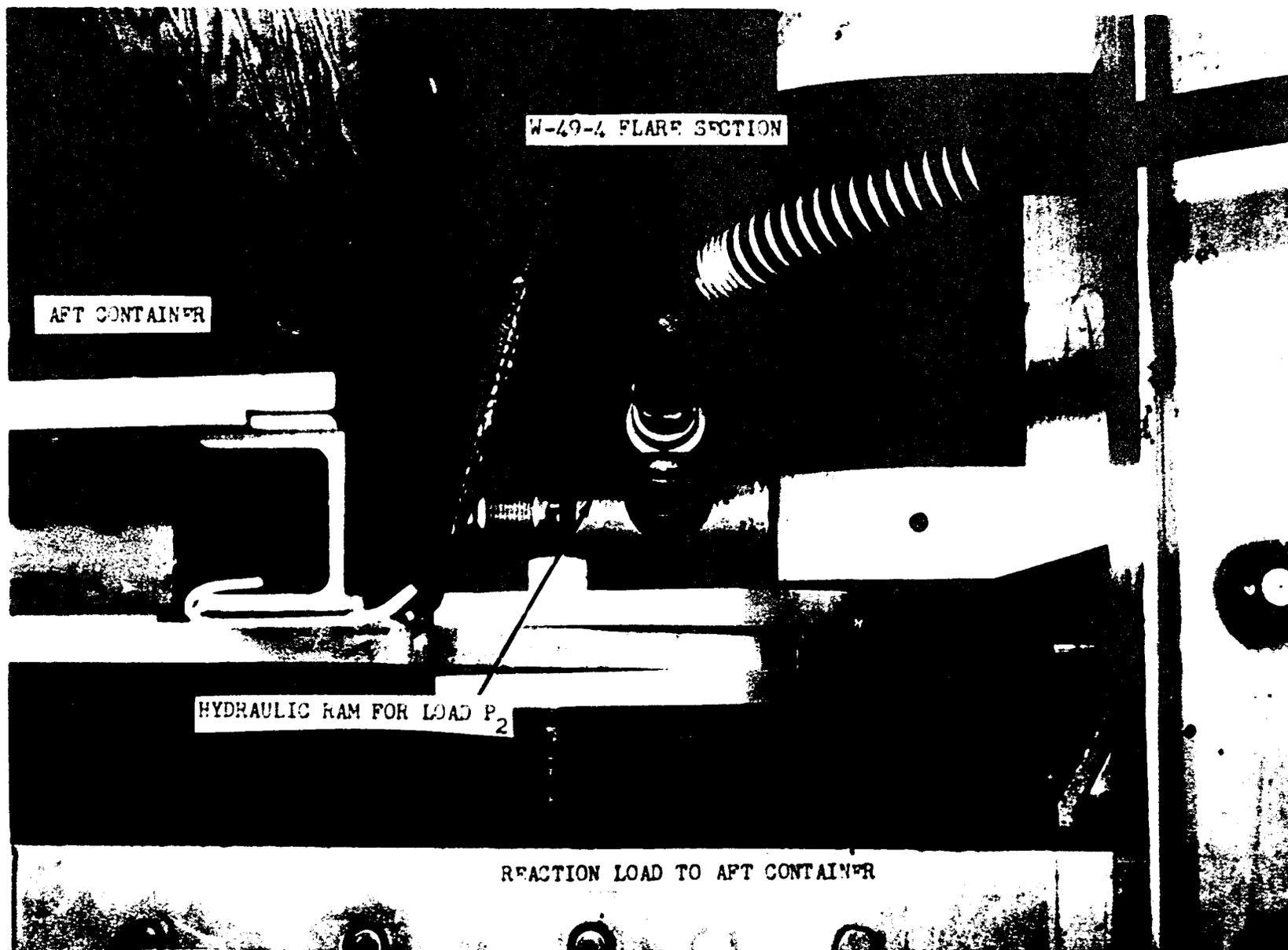


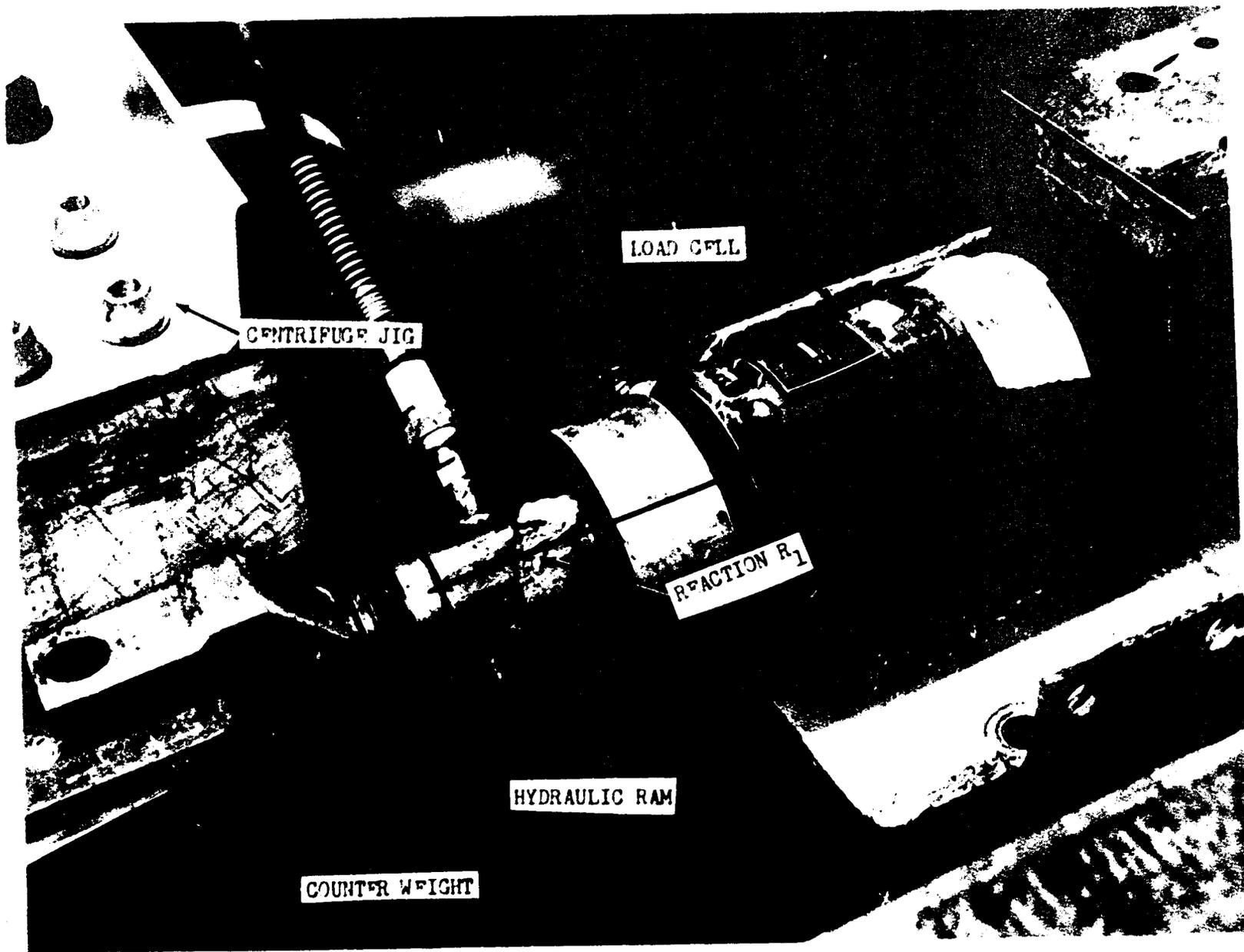
FIG. 4 - TEST SET UP - TEST OF MODIFIED AFT CONTAINER FOR W-49-4 JIG.

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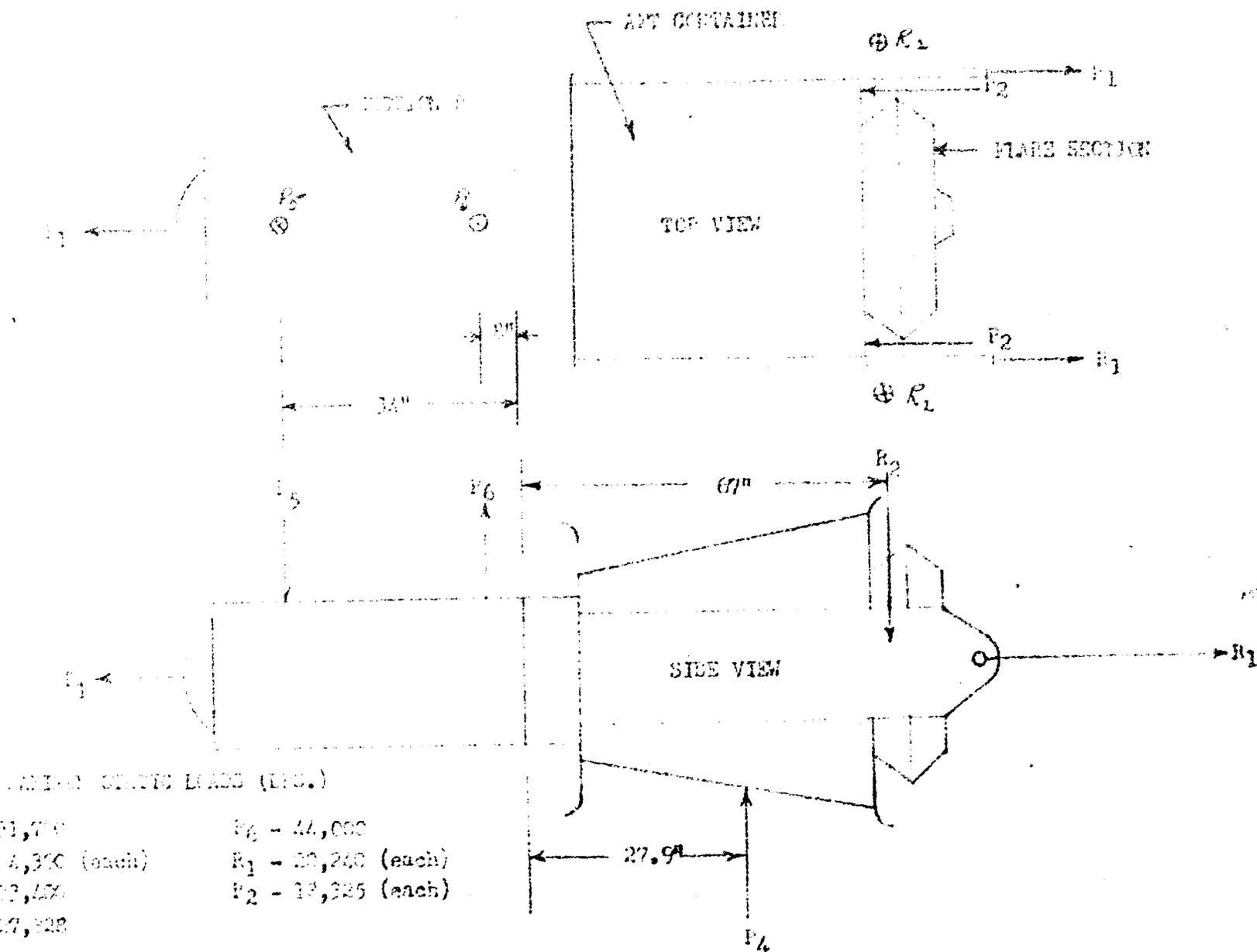
FIG. 5 - TEST SETUP — STATIC TEST OF MODIFIED AFT CONTAINER FOR W-49-A JIG.

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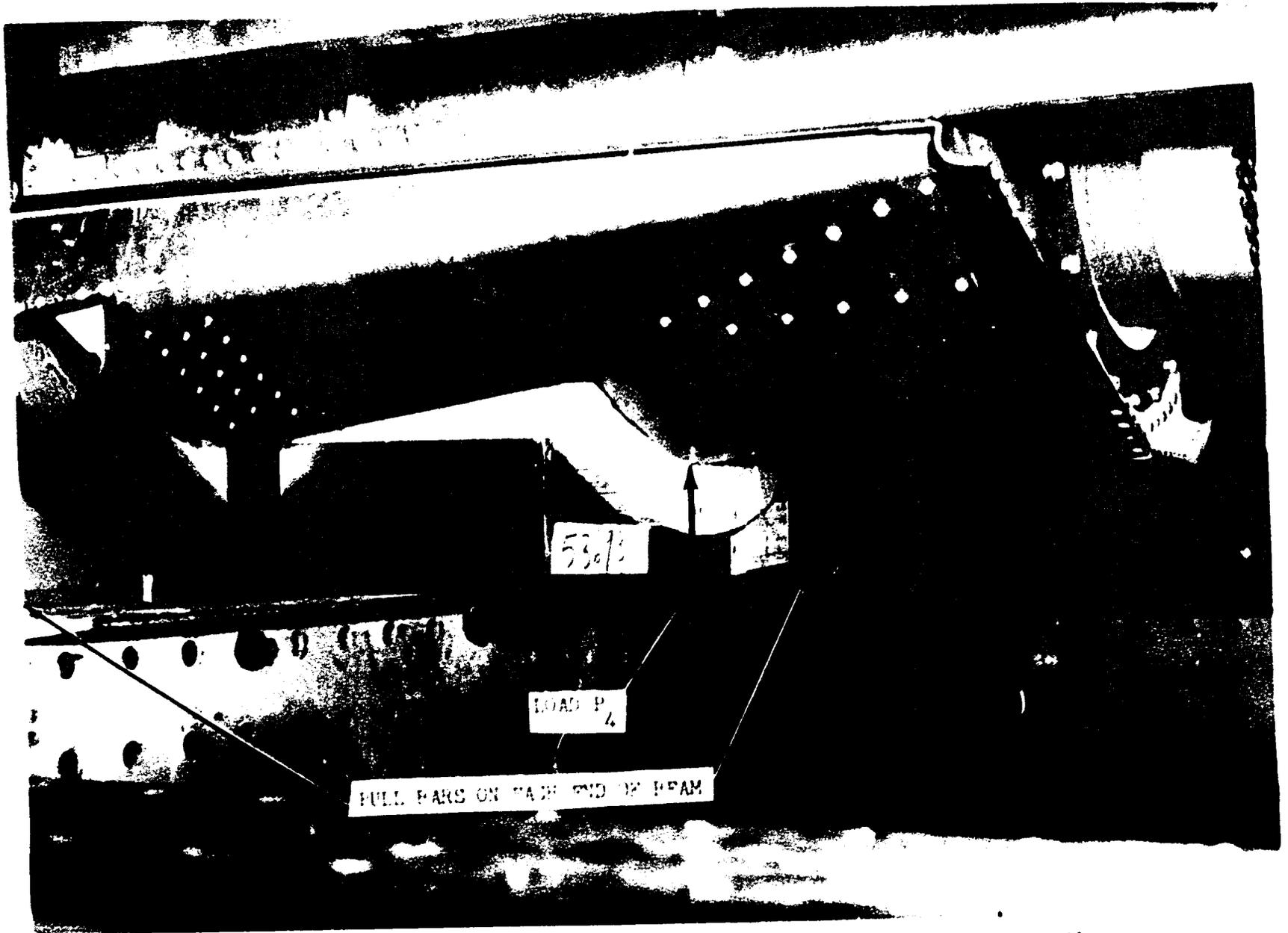
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APPLIED STATIC LOADS (LBS.)

- | | |
|----------------------|-----------------------|
| P_1 - 31,700 | P_6 - 44,000 |
| P_2 - 4,300 (each) | R_1 - 20,200 (each) |
| P_4 - 13,400 | P_2 - 18,325 (each) |
| P_5 - 17,828 | |

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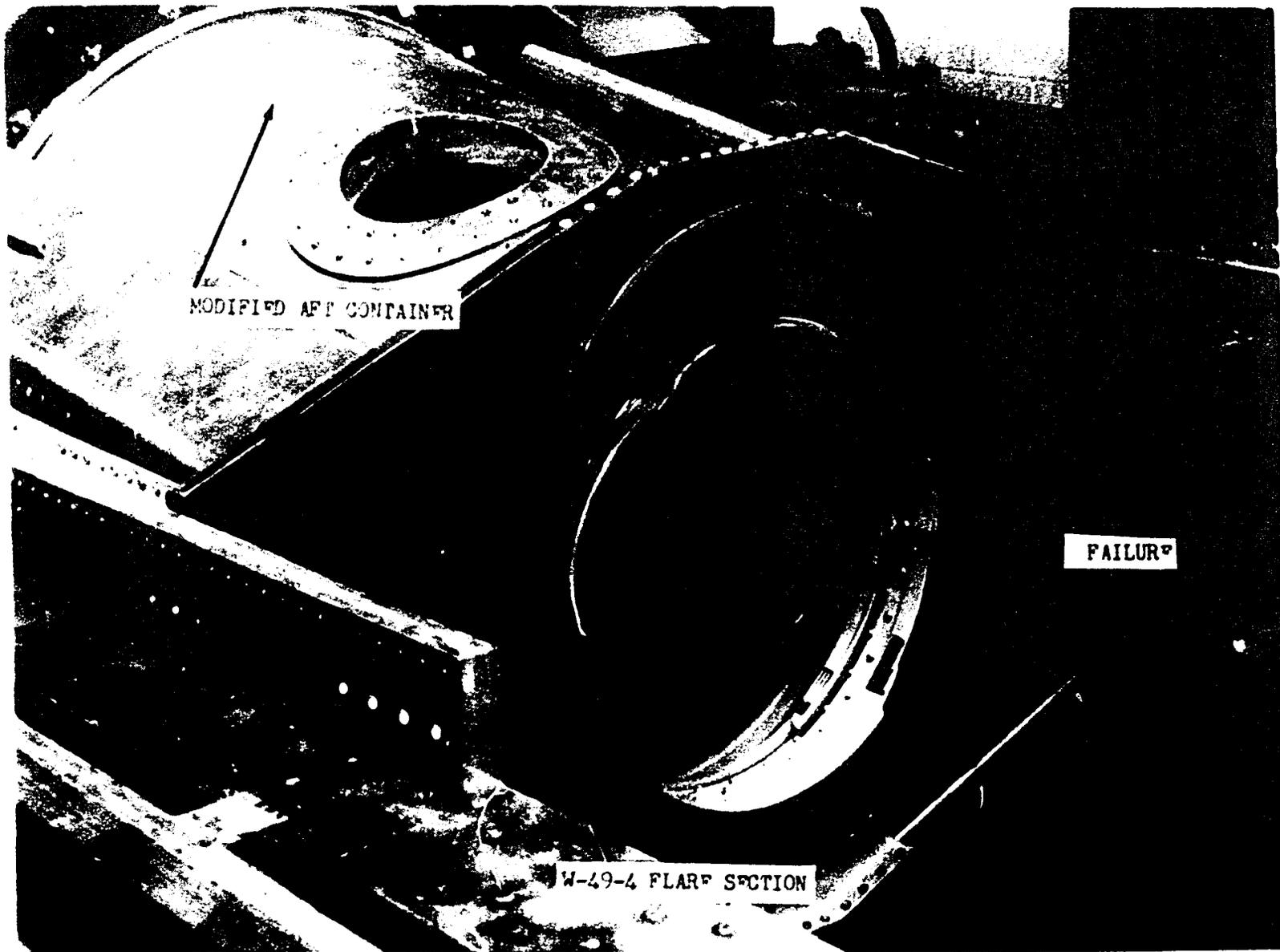


53013 — FULL PARS ON EACH END OF BEAM FOR 4-4-4 J10.

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FIG. 2 - FAILURE OF THREADED JOINT IN RE-ENTRY TMO CONDITION -
STATIC TEST OF MODIFIED AFT CONTAINER FOR W-49-4 SIG.

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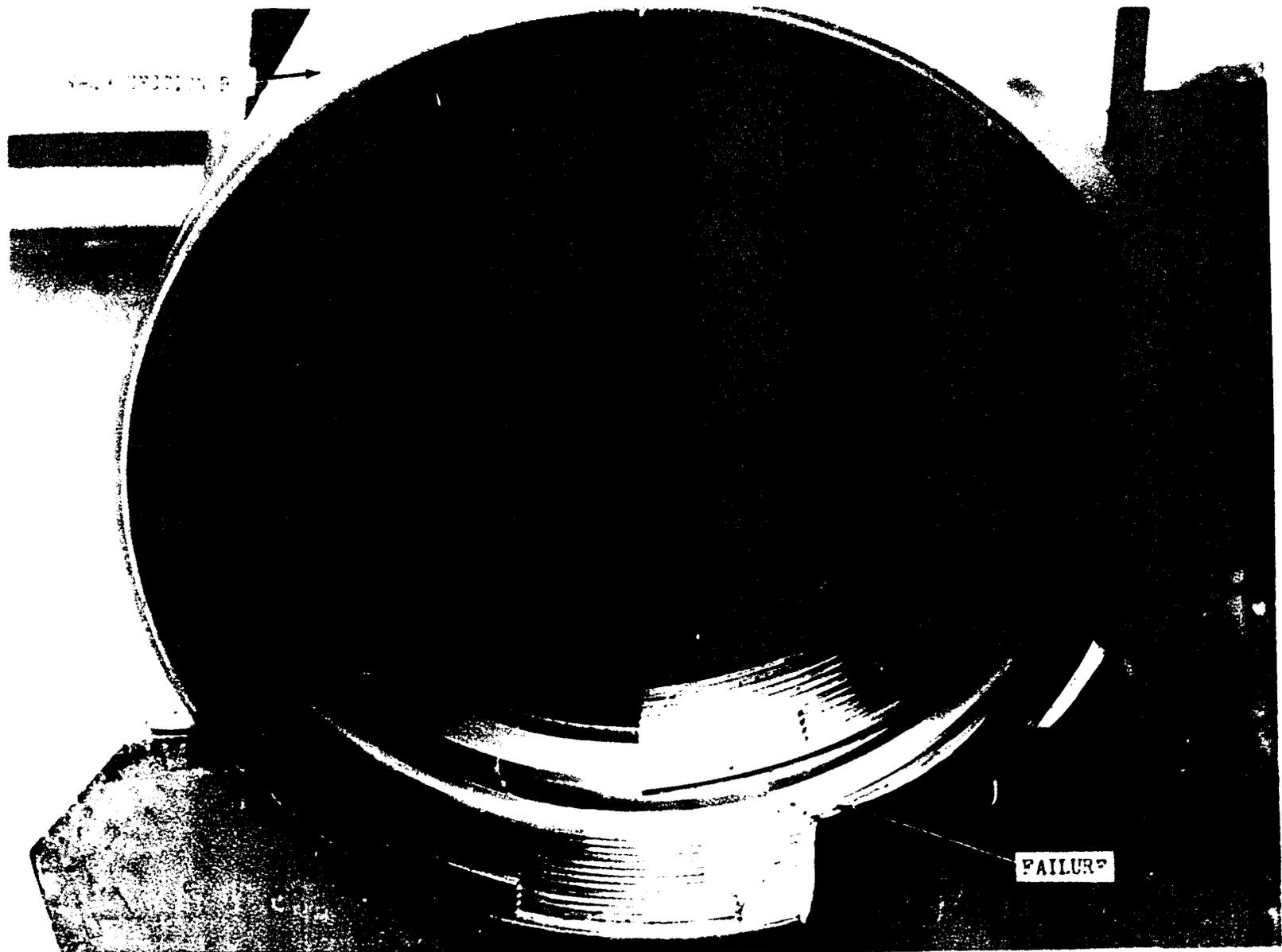


FIG. 9 - FAILURE OF THREADED JOINT IN 18-ENTRY TWC CONDITION —
SECTION THROUGH JOINT IN FAILURE CONDITION (SEE FIG. 8)

Report No. 1-20110

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