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APR 6 1962

File No: TX-28X3, 3-2
T-18219
Date Completed: 1-5-62
RS 7321/9907

INVENTORIED
SEP 14 '65
3420-3

MR. C. L. CARPENTER - 7115
Attn: B. C. Caskey

Re: Static Test of TX-28X3 Joints (U)

Summary of Test

Four separate tests were performed on the TX-28X3 to determine the moment necessary to cause failure of the various case joints under similar loading conditions.

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APR 9 1962
CENTRAL RECORD FILE

The skirt joint was banded with a .045 x 1.5 inch, 4130 steel band (160,000 to 180,000 psi) for test Conditions A, B and C.

Test Condition A - with the skirt joint banded, failure occurred at the MC-1477 Rear Case Joint under a moment load of 186,875 foot pounds and a shear load of 32,500 pounds.

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AUG 6 1964
3427-1

Test Condition B - with the skirt joint banded and the rear case joint reinforced with the H-530 spanner, failure occurred to the bolts at the MC-1477 and MC-1478 Joint. Failure occurred under a moment load of 211,250 foot pounds, and a shear load of 35,000 pounds.

Test Condition C - with the skirt joint unbanded and the MC-1477 Rear Case Joint reinforced with the H-530 Spanner Wrench, failure occurred at the skirt joint. Failure occurred under a moment load of 128,375 foot pounds, and a shear load of 22,500 pounds.

Test Condition D - with the skirt joint banded, and the rear case reinforced by welding the test fixture to the skirt, failure occurred under a moment load of 331,500 foot pounds, and a shear load of 58,000 pounds. The biaxial strain gages mounted on the band gave no [illegible] of yielding.

CENTRAL RECORD FILE
ACCOUNTABILITY CARD
FILE No. TX 28X3 3-2

Object of Test

The object of this test was to determine the moment necessary to cause failure of the various case joints under similar loading conditions.

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
DOWNGRADING OR DECLASSIFICATION STAMP
CLASSIFICATION CHANGED TO: U
AUTHORITY: W. C. Kaye
RECORD ID: 98SN3782
DATED: 8/20/98

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The test conditions to be performed were as follows:

Test Condition A - Test of MC-1677 Rear Case Joint
Test Condition B - Test of banded skirt joint
Test Condition C - Test of skirt joint without band
Test Condition D - Test of banded skirt joint

Authorization for Test

This test was requested in an Environmental Test Order (ETO) from Division 7115 to Division 7321, dated October 20, 1961. Mr. J. K. Nakayama, 7115-1 and Mr. I. B. White, 7182-2, were the test consultants.

Test Equipment and Instrumentation

The following equipment was used:

2 - Hydraulic cylinders
1 - Hydraulic ram, 30 ton capacity
1 - Load Maintainer
1 - Hydraulic pump
3 - Calibrated pull bars, Nos. 3, 4, and 5
1 - Automatic strain gage readout system

The following instrumentation was used:

3 - Biaxial strain gages, type FABR 12-.2 S-6, gage factor 2.05

Procedure

With the setup as shown in Figures 1, 2, and 3 loads were applied in 2,000 pound increments until failure occurred. For test conditions B and C, the rear case joint was reinforced with the H-530 as shown in Figure 4. For test condition D the rear case was reinforced by welding the test fixture to the skirt as shown in Figure 5. Strain gages were mounted on the band at locations as shown in Figure 6 for test condition D.

Loads were applied with hydraulic cylinders and measured with box type, calibrated pull bars, in conjunction with the load maintainer.

Results

With the skirt joint banded with a .045 X 1.5 inch, 4130 steel band (160,000 to 180,000 psi).

Test Condition A - Failure occurred at the rear case joint at the following loads, P_1= 26,000 pounds, P_2= 26,000 pounds and P_3= 32,500 pounds. For a photo of the failure see Figure 7.

Test Condition B - With the skirt joint banded the same as Condition A, and the rear case joint reinforced with the H-530 Spanner, failure occurred to the bolts at the MC-1477 and MC-1478 joint. Failure occurred to the bolts at the following loads, P_1= 28,000 pounds, P_2= 28,000 pounds and P_3= 35,000 pounds.

Test Condition C - With the skirt joint unbanded, and the rear case joint reinforced with the H-530 Spanner Wrench, failure occurred at the skirt joint at the following loads, P_1= 18,000 pounds, P_2= 13,000 pounds and P_3= 22,500 pounds. For a photo of the failure see Figure 8.

Test Condition D - With the skirt joint banded the same as Condition A, and the rear case reinforced by welding the test fixture to the skirt, failure occurred at the skirt joint at the following loads, P_1=46,000 pounds, P_2= 46,000 pounds and P_3= 58,000 pounds. The biaxial strain gages mounted on the band gave no indication of yielding. Table I lists the stress-strain data. For a photo of the failure see Figure 9.

Figure 10 is a sketch of the joint loads and load locations for the test.

Harry Warrick
HARRY WARRICK - 7322-1

R. G. Hamilton
7321 Project Engineer: R. G. HAMILTON - 7321-5

Approved By: R. S. HOOPER - 7321-5

HW:7322-1:mw

Distribution:
1/7A - C. L. Carpenter, 7115
2/7A - D. H. Bruce, 7102, Attn: I. B. White
3/7A - J. H. Wiesen, 1442
4/7A - D. S. Bliss, 2344
5/7A - E. H. Copeland, 7321
6/7A - C. L. Johnson, 7323
7/7A - R. K. Smeltzer, 3421-3

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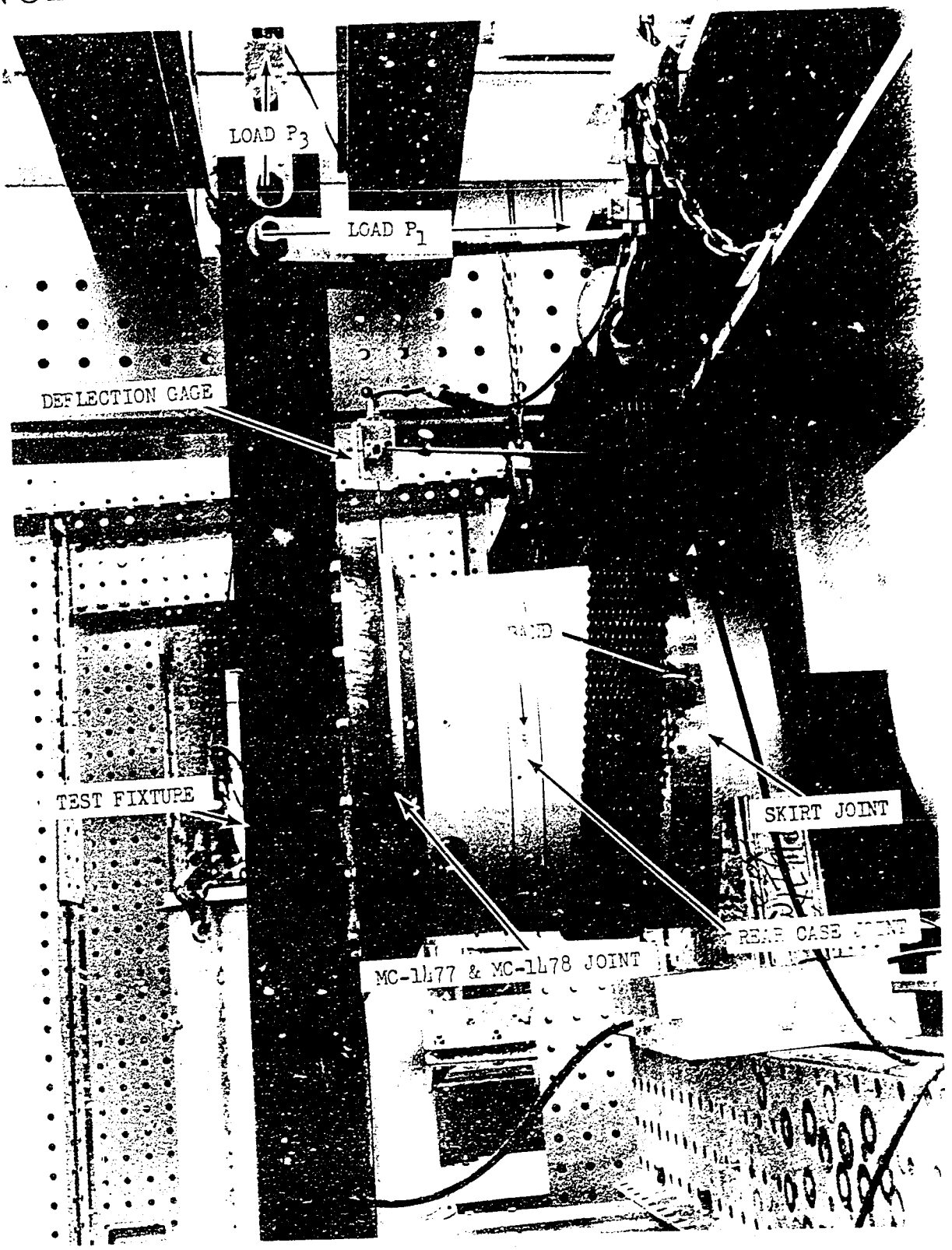

FIG.1--TEST SET-UP--STATIC TESTS OF TX28X3 JOINTS

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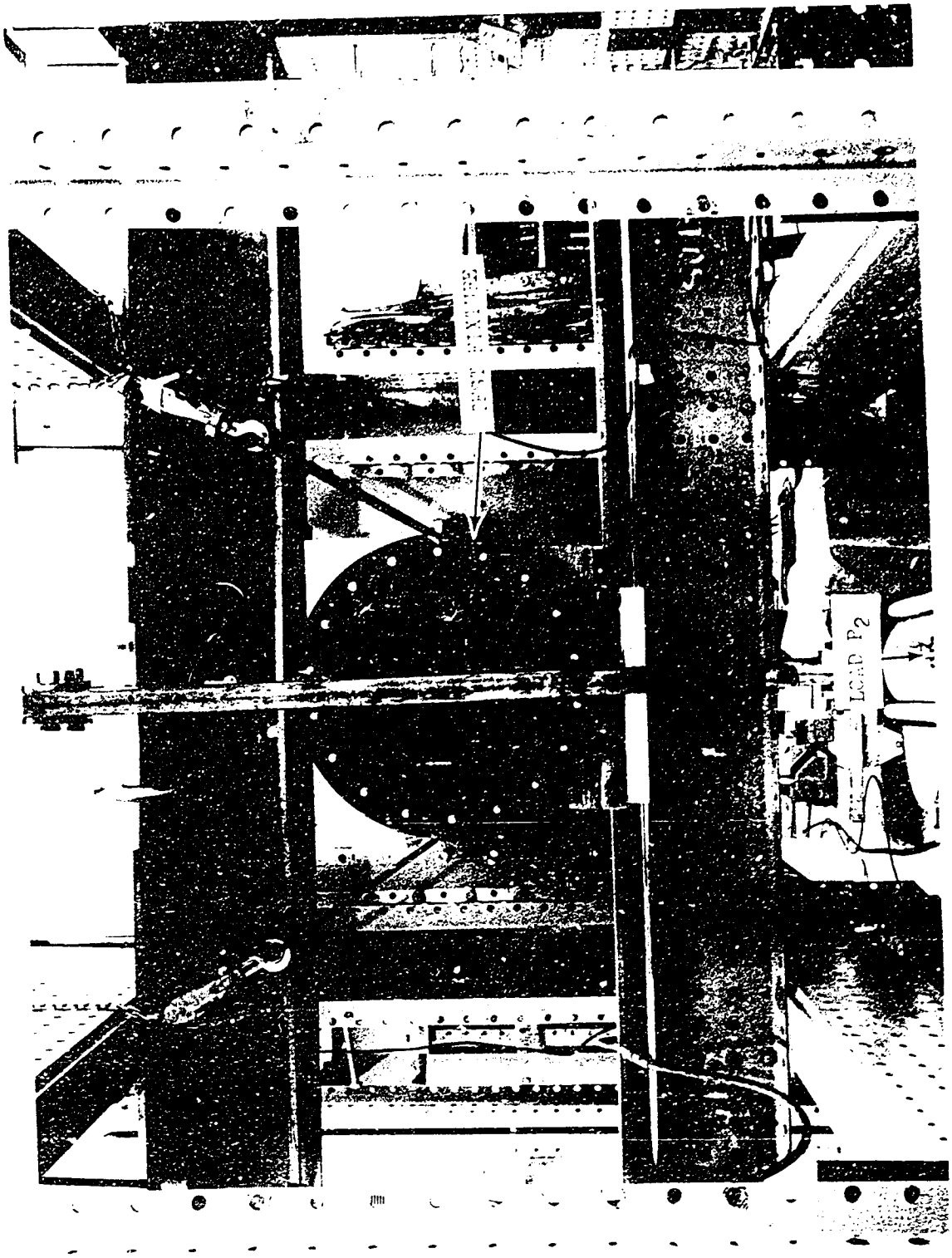

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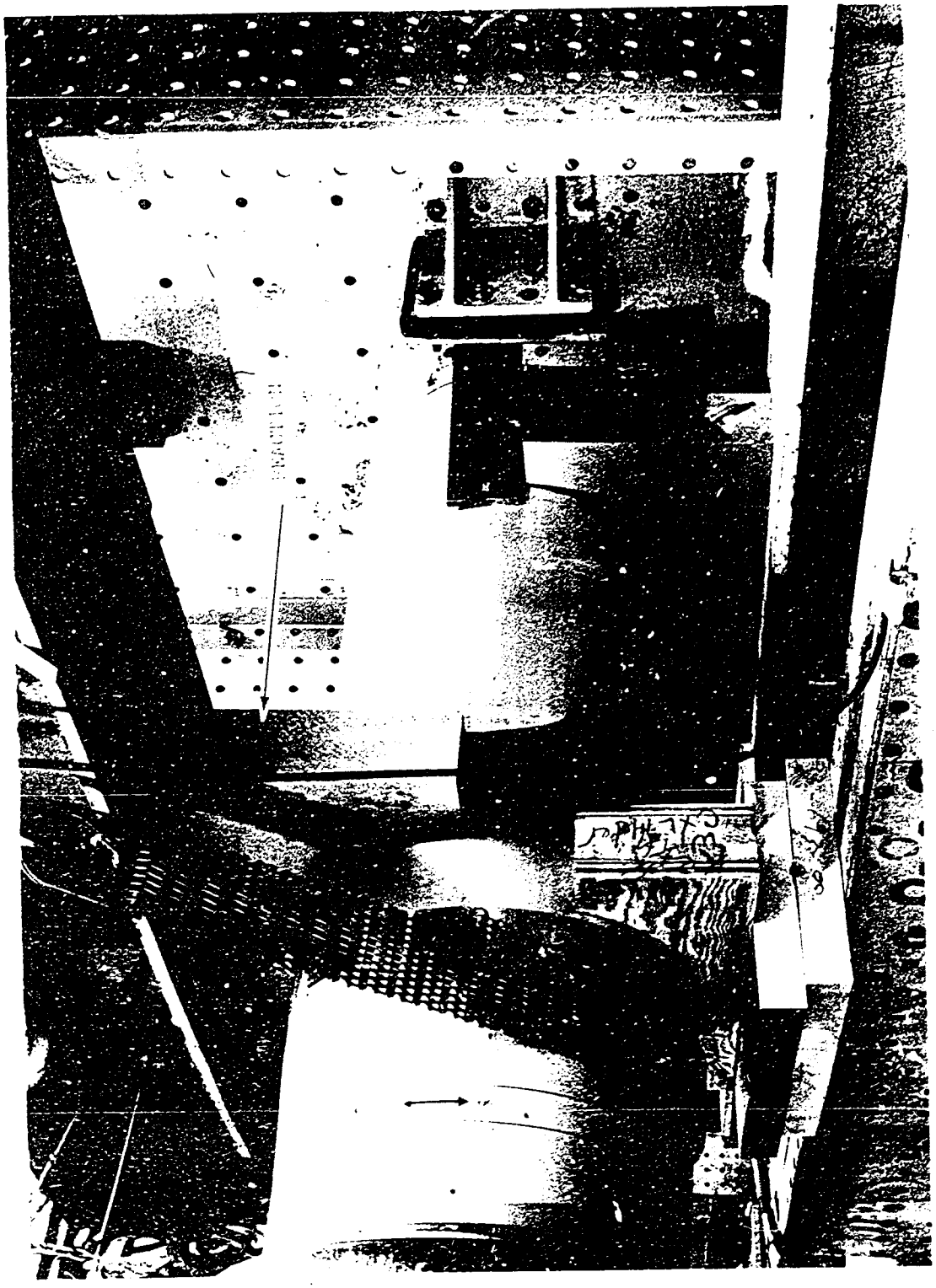

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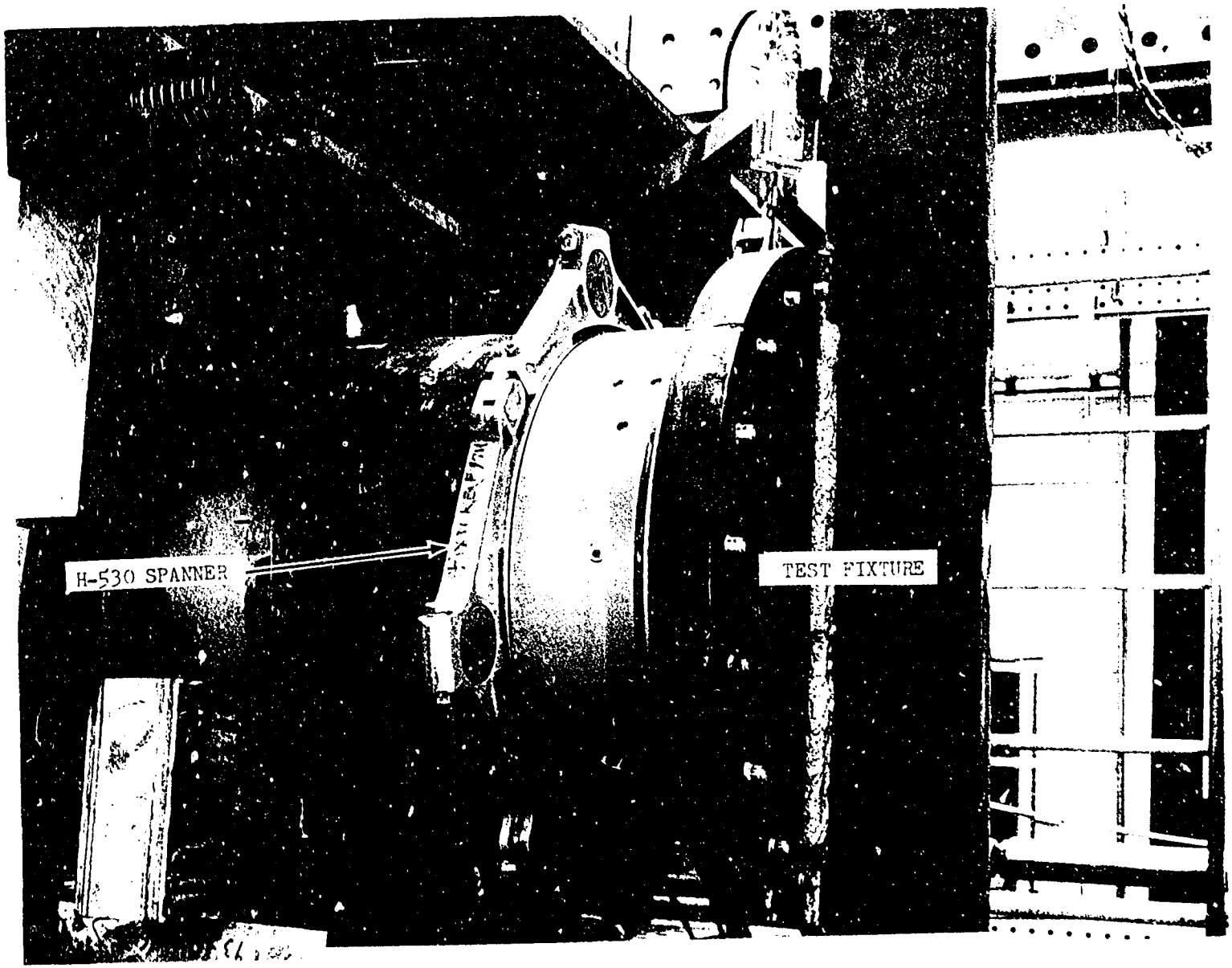

FIG.4--METHOD OF REINFORCING REAR CASE JOINT--
STATIC TESTS OF TX38X3 JOINTS

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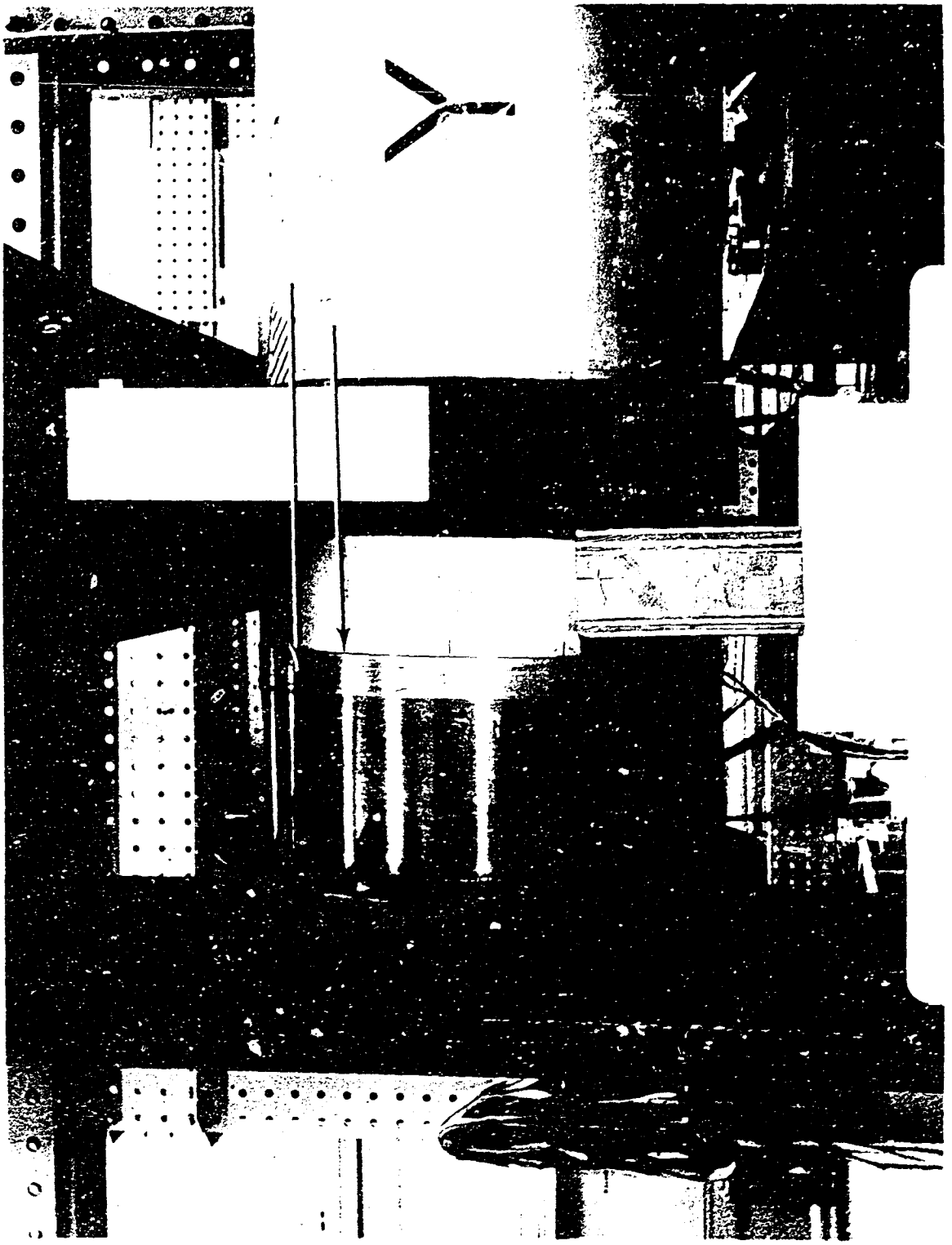

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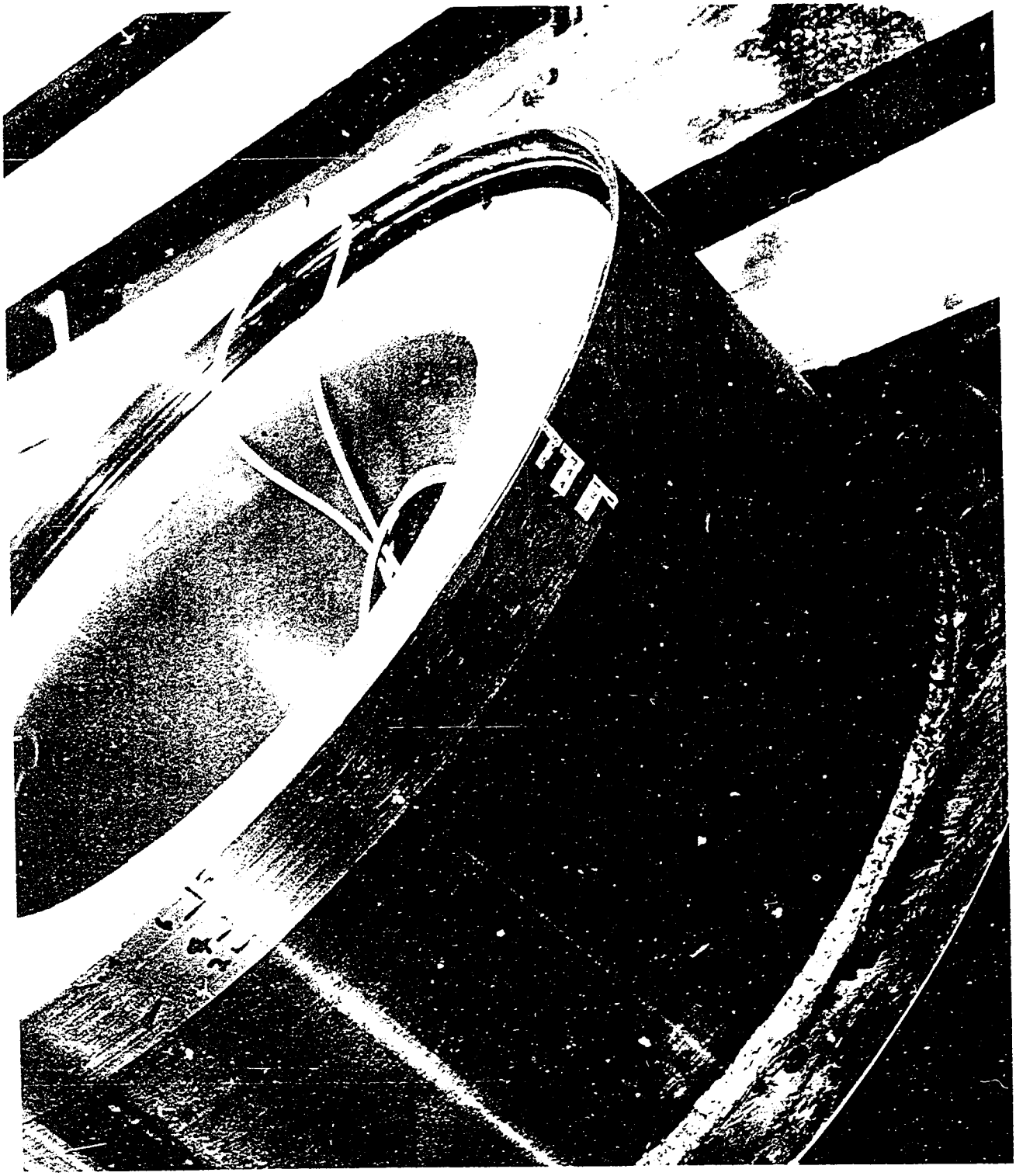

FIG.6--STRAIN GAGE LOCATIONS,TEST CONDITION D--
STATIC TESTS OF TX28X3 JOINTS

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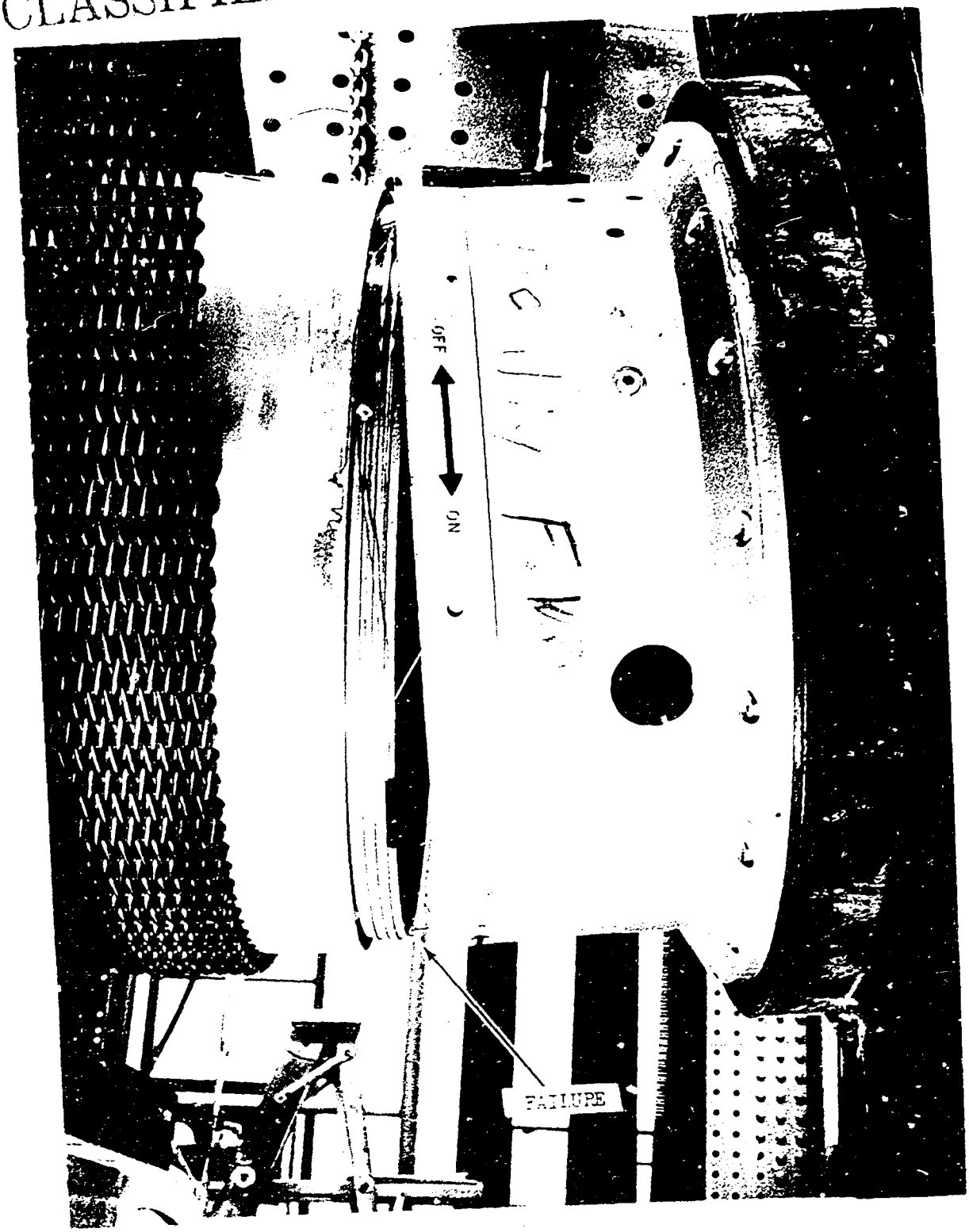

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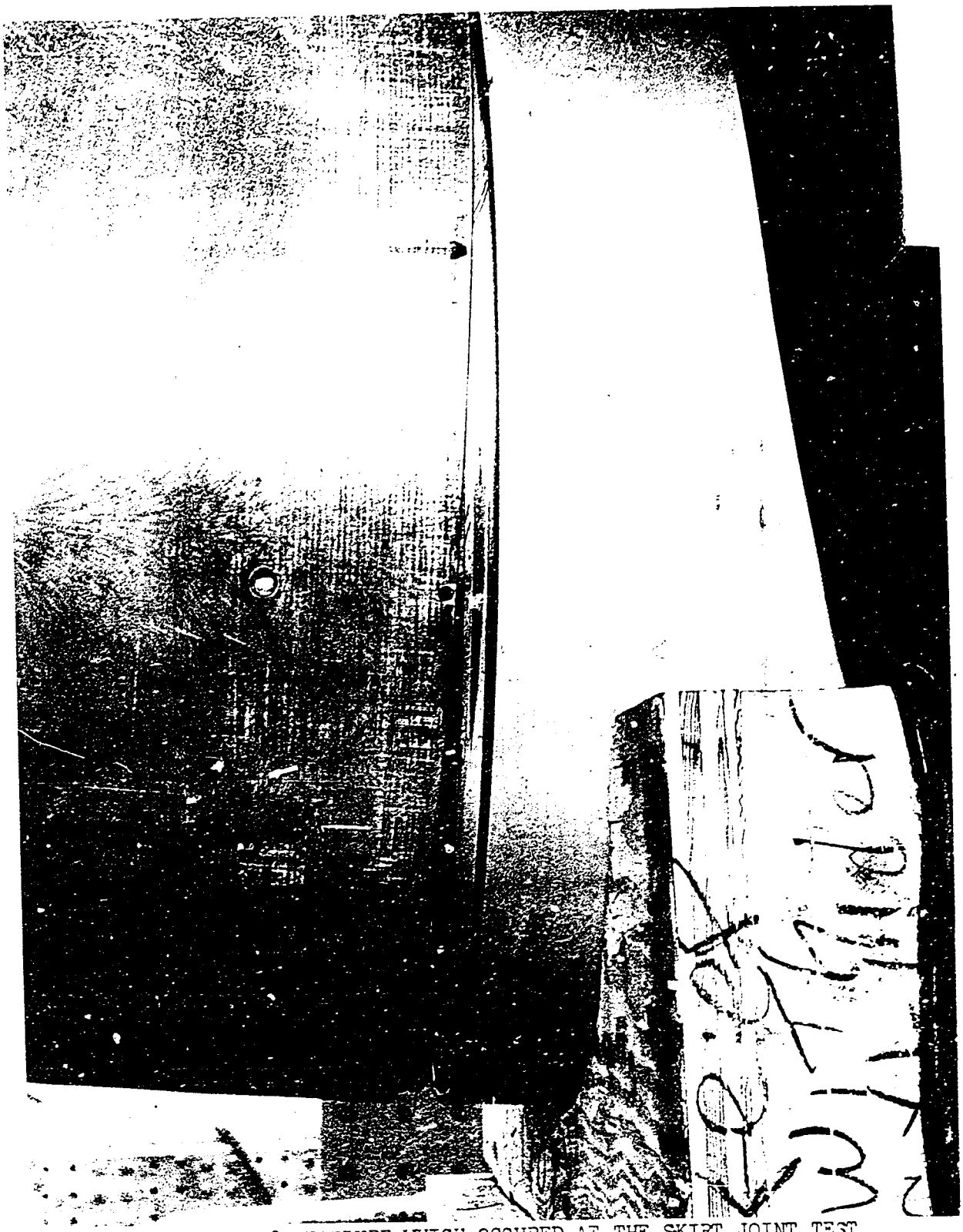

FIG.8--FAILURE WHICH OCCURED AT THE SKIRT JOINT, TEST CONDITION C--STATIC TESTS OF TX28X3 JOINTS

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FIG.9--FAILURE WHICH OCCURRED AT THE SKIRT JOINT, TEST CONDITION D--STATIC TESTS OF TX28X3 JOINTS

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RS 7321/9907

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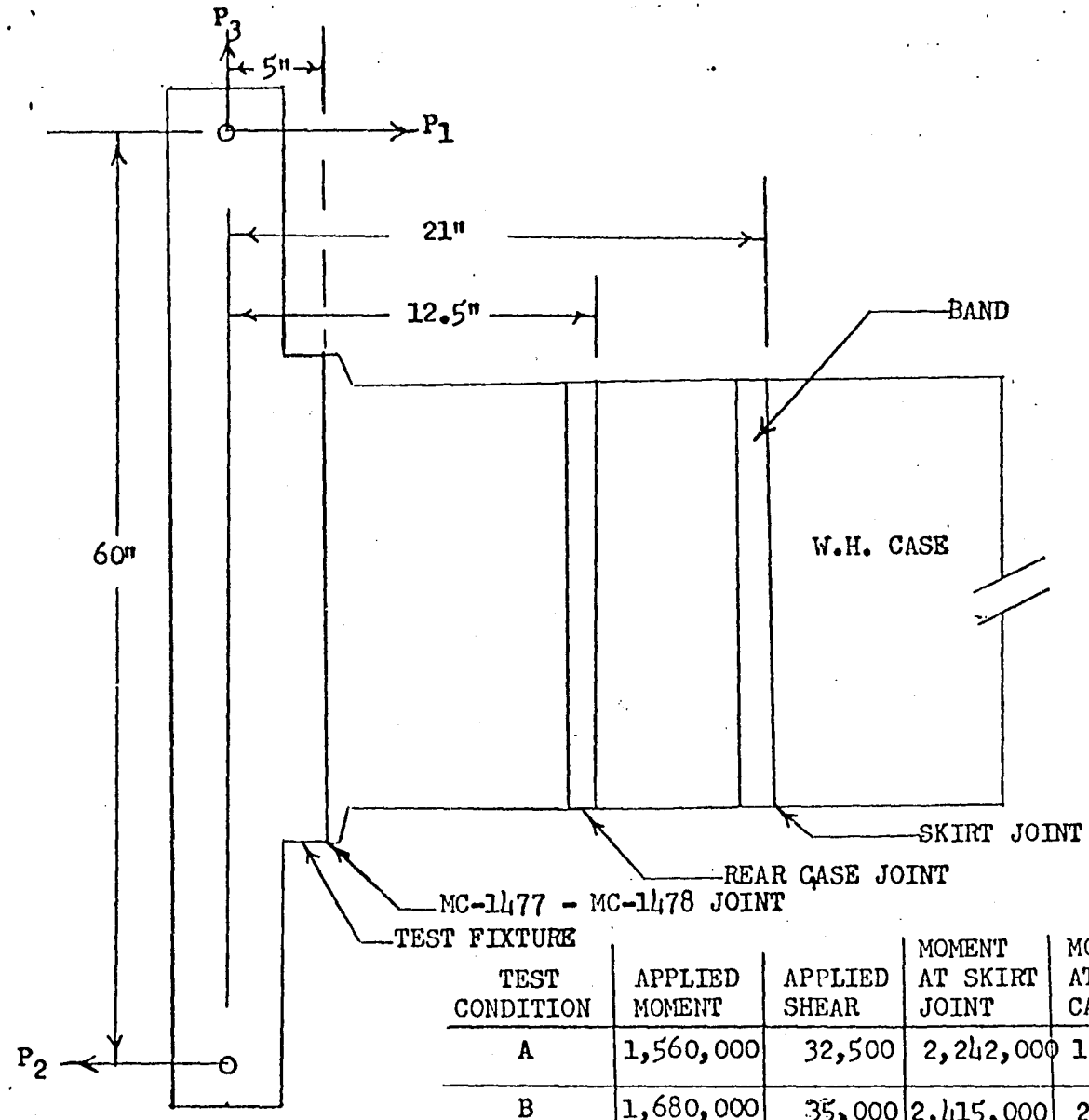

TEST CONDITION	APPLIED MOMENT	APPLIED SHEAR	MOMENT AT SKIRT JOINT	MOMENT AT REAR CASE JOINT	MOMENT AT MC-1477-1478 JOINT
A	1,560,000	32,500	2,242,000	1,966,000 (FAILURE)	1,722,500
B	1,680,000	35,000	2,415,000	2,118,000	1,855,000 (FAILURE)
C	1,080,000	22,500	1,553,000 (FAILURE)	1,362,000	1,192,500

FIG.10--JOINT LOADS AND LOCATIONS, TEST CONDITIONS A, B AND C--
STATIC TESTS OF TX28X3 JOINTS

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TABLE II
STRESS-STRAIN DATA, TEST CONDITION D - STATIC TESTS OF TX28X3 JOINTS

STRAIN - MICROINCHES PER INCH

LOAD	BIAXIAL 1		BIAXIAL 2		BIAXIAL 3		BIAXIAL 4		BIAXIAL 5		BIAXIAL 6	
0/0	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0
002	-80	-20	-50	-1	-120	1						
005	-220	-10	-100	100	-200	270						
010	-410	30	-210	360	-280	730						
015	-600	120	-260	600	-370	1140						
018	-720	220	-290	810	-440	1470						
020	-790	280	-320	910	-520	1670						
022	-840	310	-340	980	-560	1850						
024	-900	320	-360	1050	-590	1960						
026	-1000	350	-380	1120	-620	2120						
028	-1050	380	-450	1200	-670	2250						
030	-1100	400	-500	1300	-720	2400						
032	-1150	400	-540	1410	-770	2580						
034	-1240	480	-580	1490	-800	2760						
036	-1320	500	-650	1590	-820	2970						
038	-1370	540	-730	1660	-860	3190						
040	-1500	580	-800	1820	-970	3510						
042	-1610	580	-880	1910	-1060	3830						
044	-1740	620	-1040	2030	-1140	4220						

STRESS - POUNDS PER SQUARE INCH

LOAD	BIAXIAL 1		BIAXIAL 2		BIAXIAL 3		BIAXIAL 4		BIAXIAL 5		BIAXIAL 6	
	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
002	-2745	-1360	-1612	-482	-3838	-1047						
005	-7144	-2298	-2307	2307	-3985	6859						
010	-12876	-2724	-3497	9654	-2415	20888						
015	-18159	-1547	-2942	16900	-1614	33225						
018	-21107	581	-2016	23363	-892	43176						
020	-22812	1875	-2079	26300	-1659	48869						
022	-24145	2387	-2091	28364	-1323	54281						
024	-25979	2169	-2103	30429	-1296	57538						
026	-28916	2232	-2115	32493	-819	62398						
028	-30249	2744	-3640	34429	-1254	66117						
030	-31672	2936	-4344	37186	-1508	70476						
032	-33275	2486	-4637	40353	-1493	75798						
034	-35442	4242	-5201	42556	-837	81300						
036	-37827	4164	-6546	45135	410	87853						
038	-39071	4997	-8482	46660	1105	94547						
040	-42879	5111	-9288	51161	455	103818						
042	-46406	4122	-11043	53327	447	113269						
044	-50214	4236	-15095	55736	1388	125054						

UNSIGNED NUMBER SIGNIFIES TENSION
NUMBER SIGNED (-) SIGNIFIES COMPRESSION
S1(STRESS IN THE DIRECTION OF THE LOWEST NUMBERED GAGE)
S2(STRESS IN THE DIRECTION OF THE HIGHEST NUMBERED GAGE)
"E" = 29.5
"μ" = .285