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274

10/15/98
RB Crane
10/26/98
W Layne

TCG-NNT-1

AUG 22 1961

File No. P-6
T-17385
Completed: 2/10/61

MR. A. V. ENGEL, JR. - 7115
Attn: H. A. Tendall

Re: Static Test of Release Assembly (U)

Summary of Test

A parachute release assembly was subjected to simulated parachute loads for the purpose of determining its structural adequacy. Under a total load of 76,000 pounds applied to deploying ring A through eight shroud lines and shroud line release levers, the maximum calculated stress was 63,170 psi compression. The unit failed at a total applied load of 80,000 pounds. Failure occurred in the MC-1113 to which the shroud line release levers were attached.

Authorization for Test

The test was performed in accordance with a Work Order Authorization from Division 7115 to E. H. Copeland, 7321, and dated November 15, 1960. Mr. H. A. Tendall, 7115, and Mr. I. B. White, 7182, were consultants for the test.

Summary of Past Tests

No previous static tests had been run on this release assembly.

Equipment and Instrumentation

The following equipment was used during the test:

1 - 2" dia. calibrated pull bar 1 - Hydraulic Load Maintainer

The following instrumentation was used during the test:

34 - SR 4 Biaxial Strain Gages, FABK-25-12, Lot No. 22
1 - Fairchild Strain Gage Readout Control Unit

CENTRAL RECORD FILE
ACCOUNTABILITY CARD
FILE No. P-6

RECEIVED
AUG 24 1961
CENTRAL RECORD FILE

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
DOWNGRADING OR DECLASSIFICATION STAMP

CLASSIFICATION CHANGED TO: U Carmela Dallazo 10/26/98 PERSON CHANGING MARKING & DATE W C Layne 10/28/98 PERSON VERIFYING MARKING & DATE	AUTHORITY: W C Layne RECORD ID: 99SN0201 DATED: 10/26/98

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Procedure

The two deploying rings, A & B of the release assembly were instrumented with SR 4 biaxial strain gages as shown in Figures 1 through 4. These deploying rings were fabricated from 2556 aluminum. Parachute shroud lines were secured by shroud line release levers to the forward end of the MC-1113 tail section. These lines were so arranged that eight of them would be released by Plate A and eight by Plate B. The unit was then mounted in the static jig, and the shroud lines for Plate A fastened to a large circular loading ring as shown in Figure 5. A single load was applied to the circular ring thus loading each of the shroud lines. This load was applied in increments and strain gage readings were taken at each increment.

Results

At a total applied load of 80,000 pounds, the test unit failed. Failure occurred in the ring to which the shroud line release levers were attached at the forward end of the MC-1113. This failure is shown in Figure 6. At a total load of 76,000 pounds, the highest calculated stress was 63,170 psi compression at Gage No. 15 (See Fig. 1). Measured strains and calculated stresses are given in Table I.

H. W. Nunez
H. W. NUNEZ - 7322-1

R. G. Hamilton
7321 PROJECT ENGINEER: R. G. HAMILTON - 7321-5

APPROVED BY: R. S. HOOPER - 7321-5

HN:br

Encs: Table I
Figs. 1-6

Distribution:
D. M. Bruce, 7182, Attn: I. B. White
J. M. Wiesen, 1442
D. S. Bliss, 2344
E. H. Copeland, 7321
J. R. Harrison, 7523
R. K. Shelteer, 3421-3

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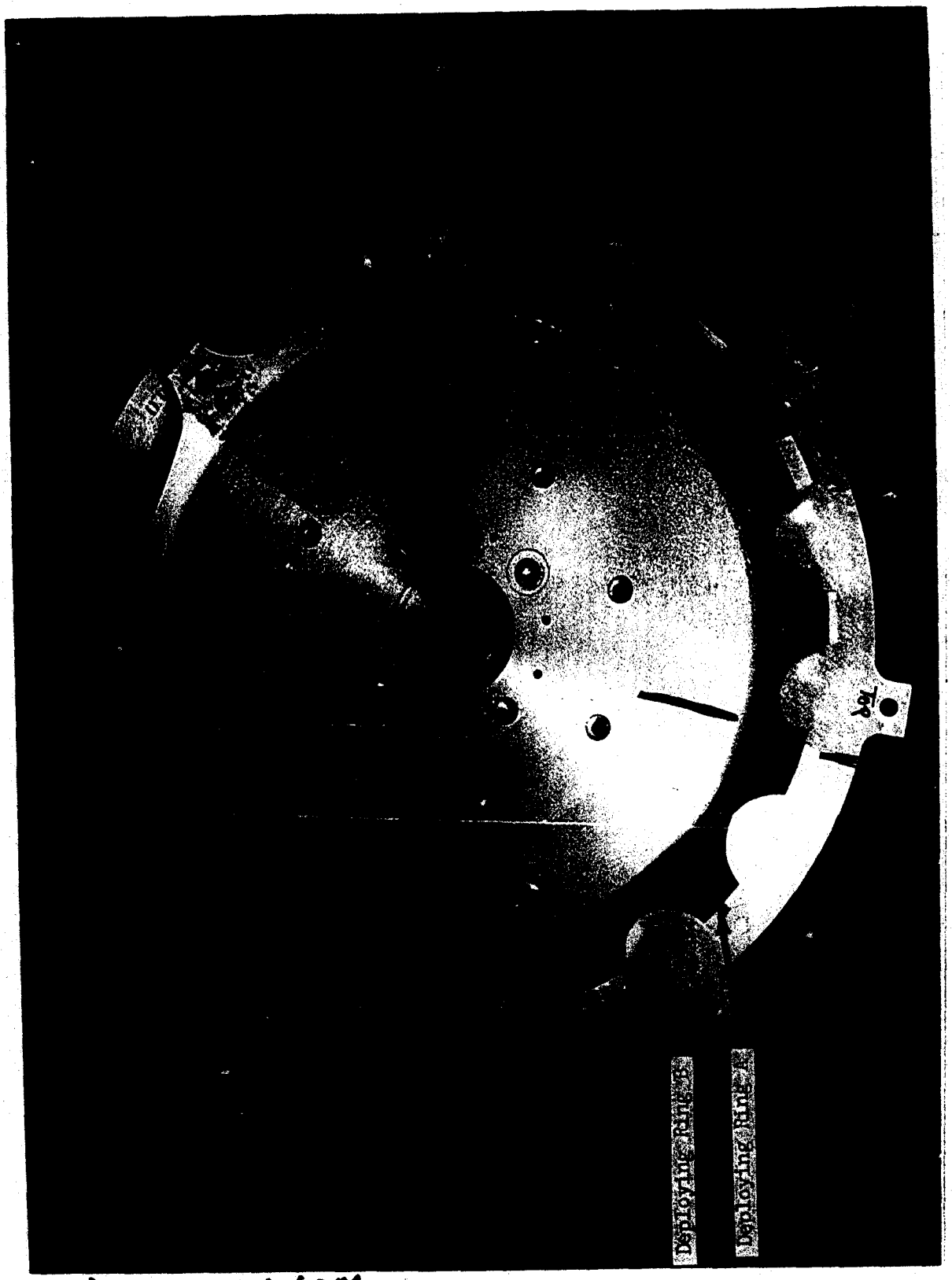

Figure 1 - - Strain Gage Locations -- Static Test of Release Assembly.

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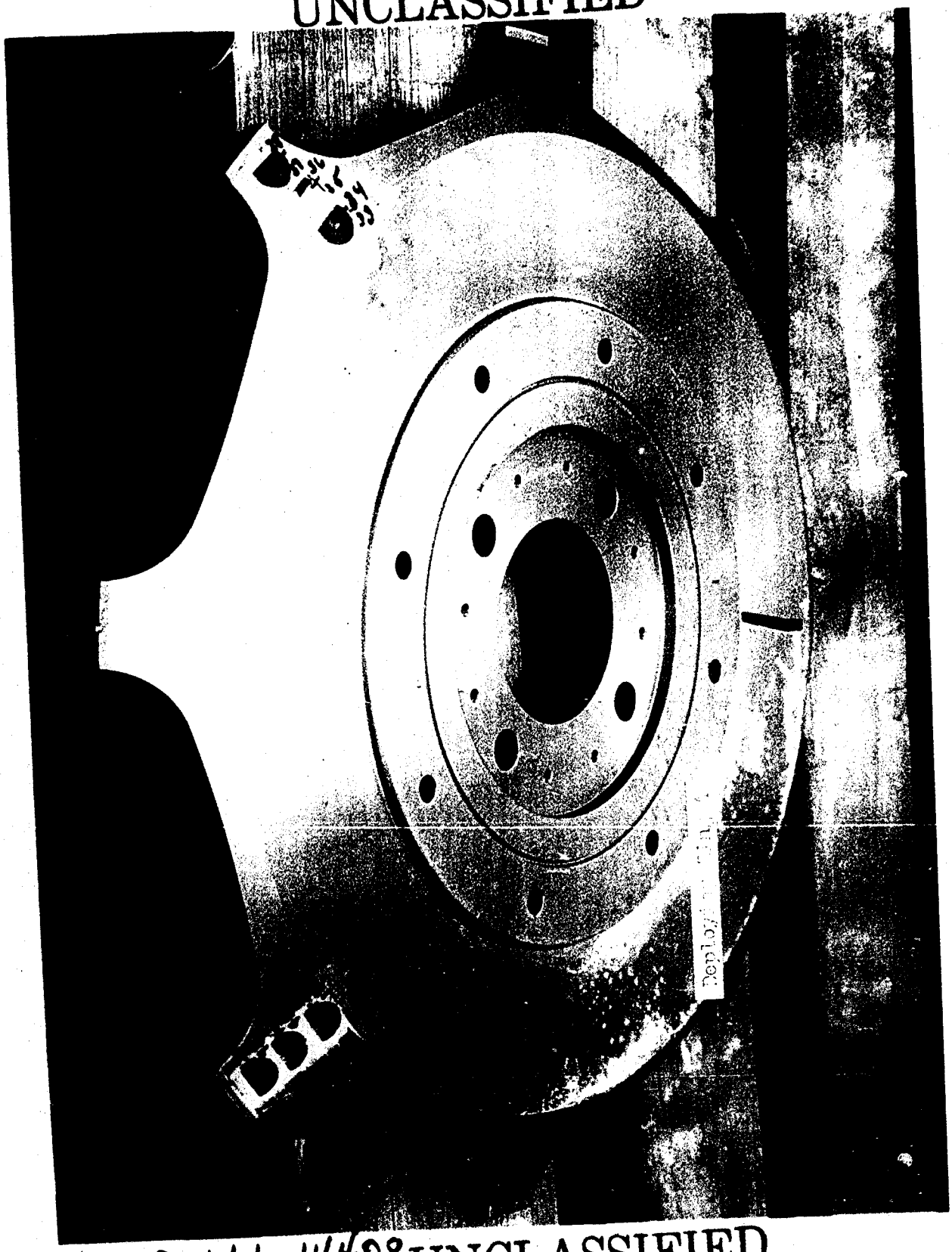

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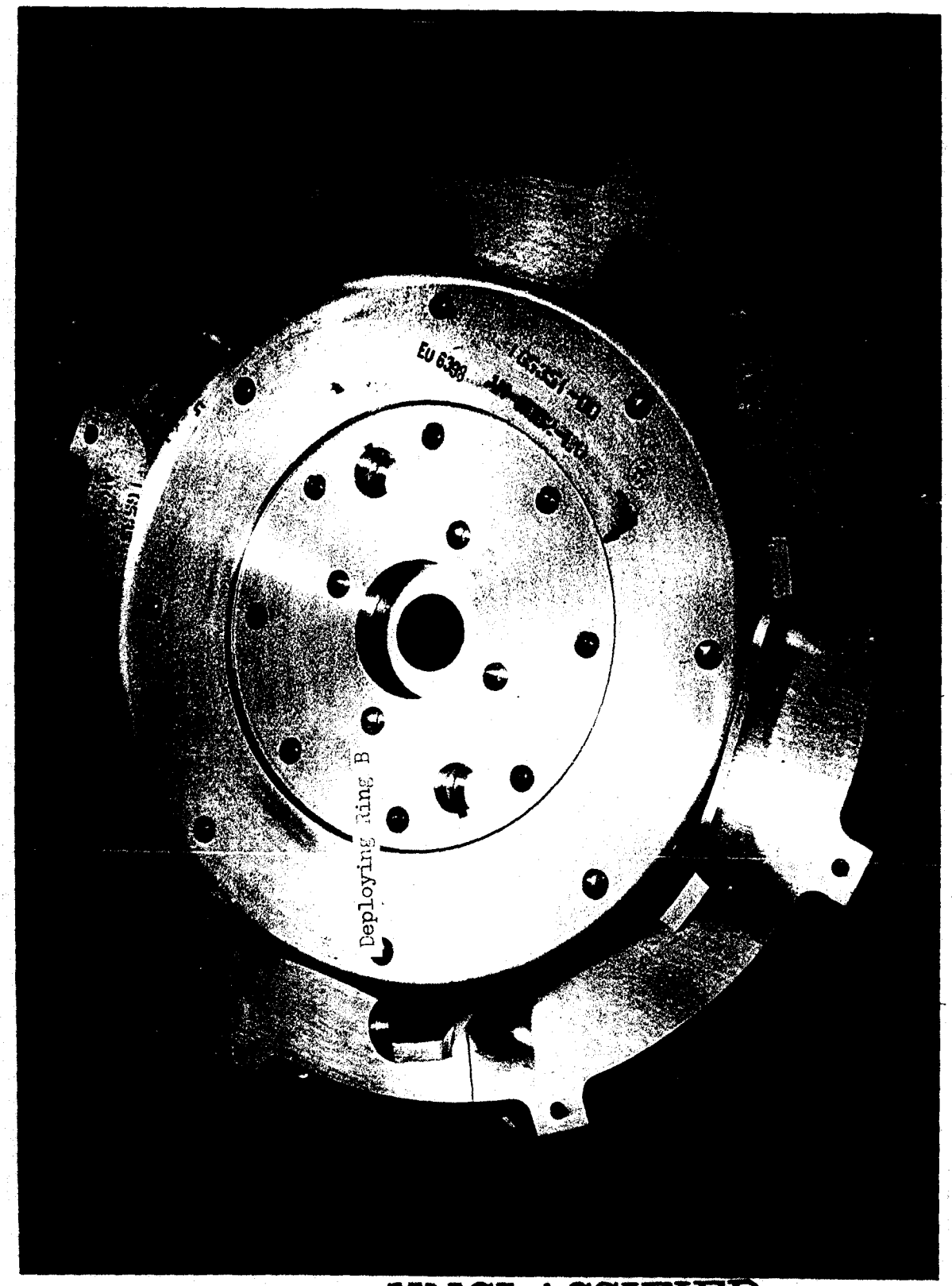

Figure 3 -- Strain Gage Locations -- Static Test of Release Assembly.

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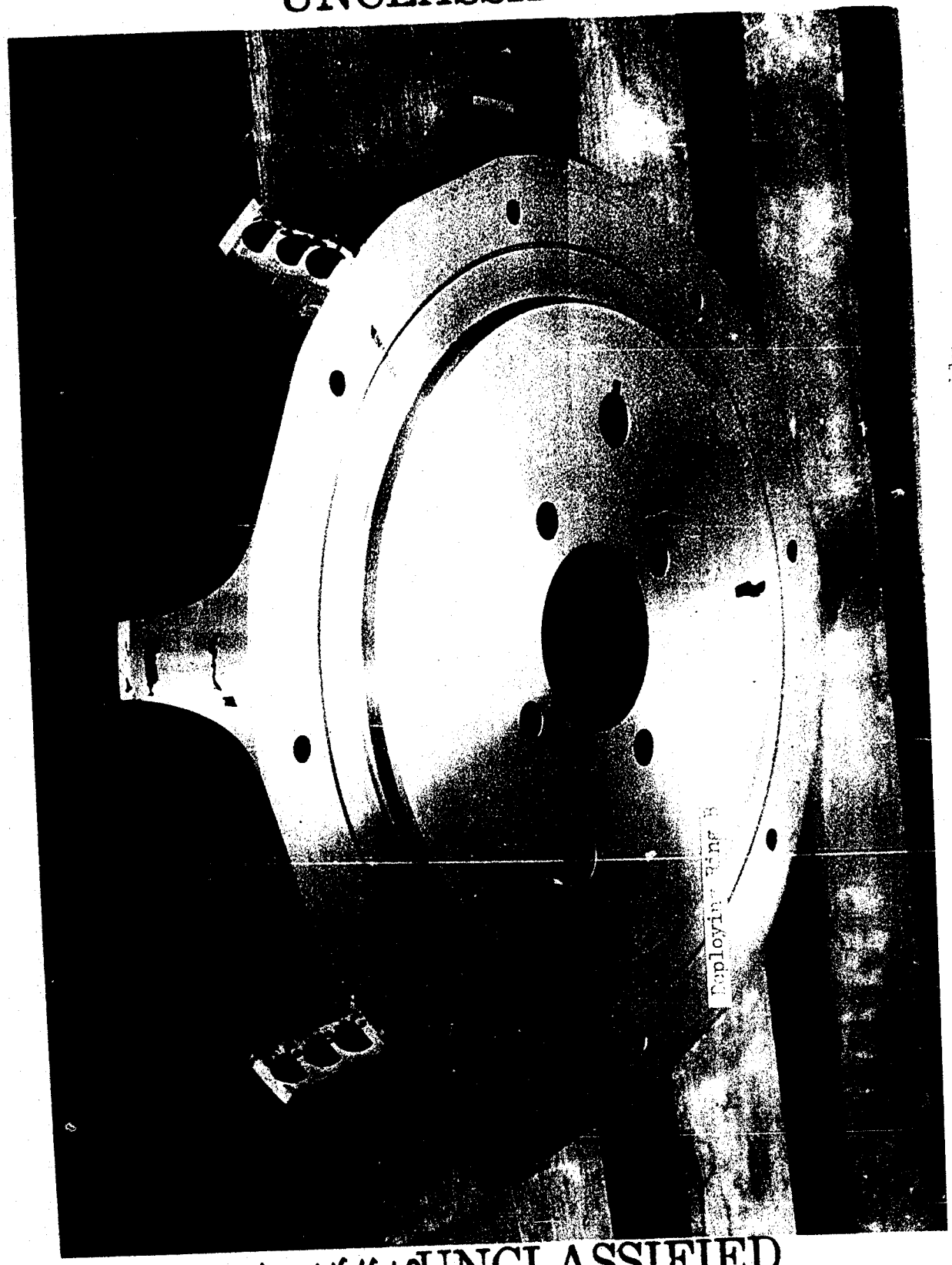

Figure 4 - - Strain Gage Locations -- Static [illegible] Assembly.

-173

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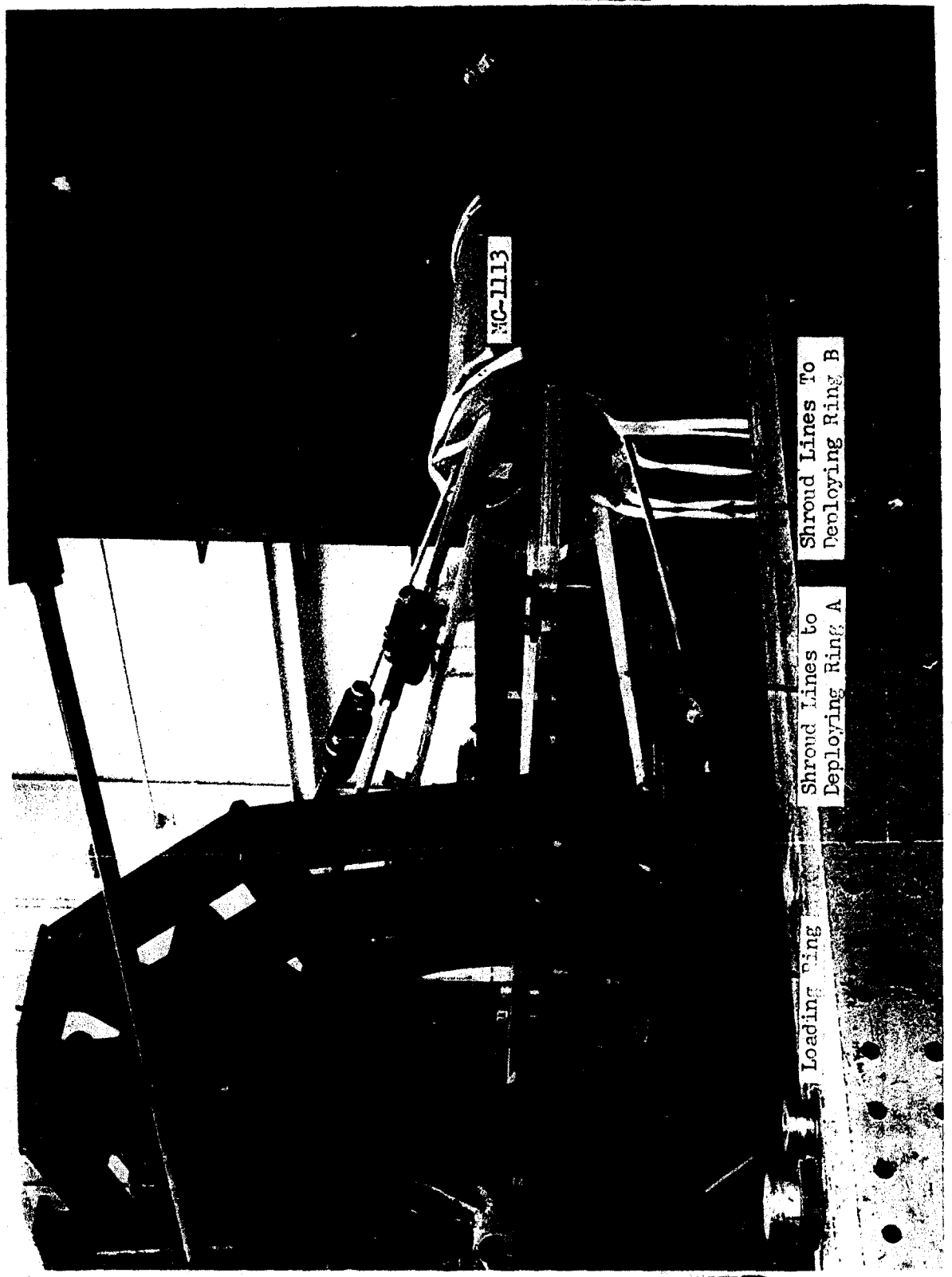

Figure 5 - - Test Setup For Static Test of Release Assembly.

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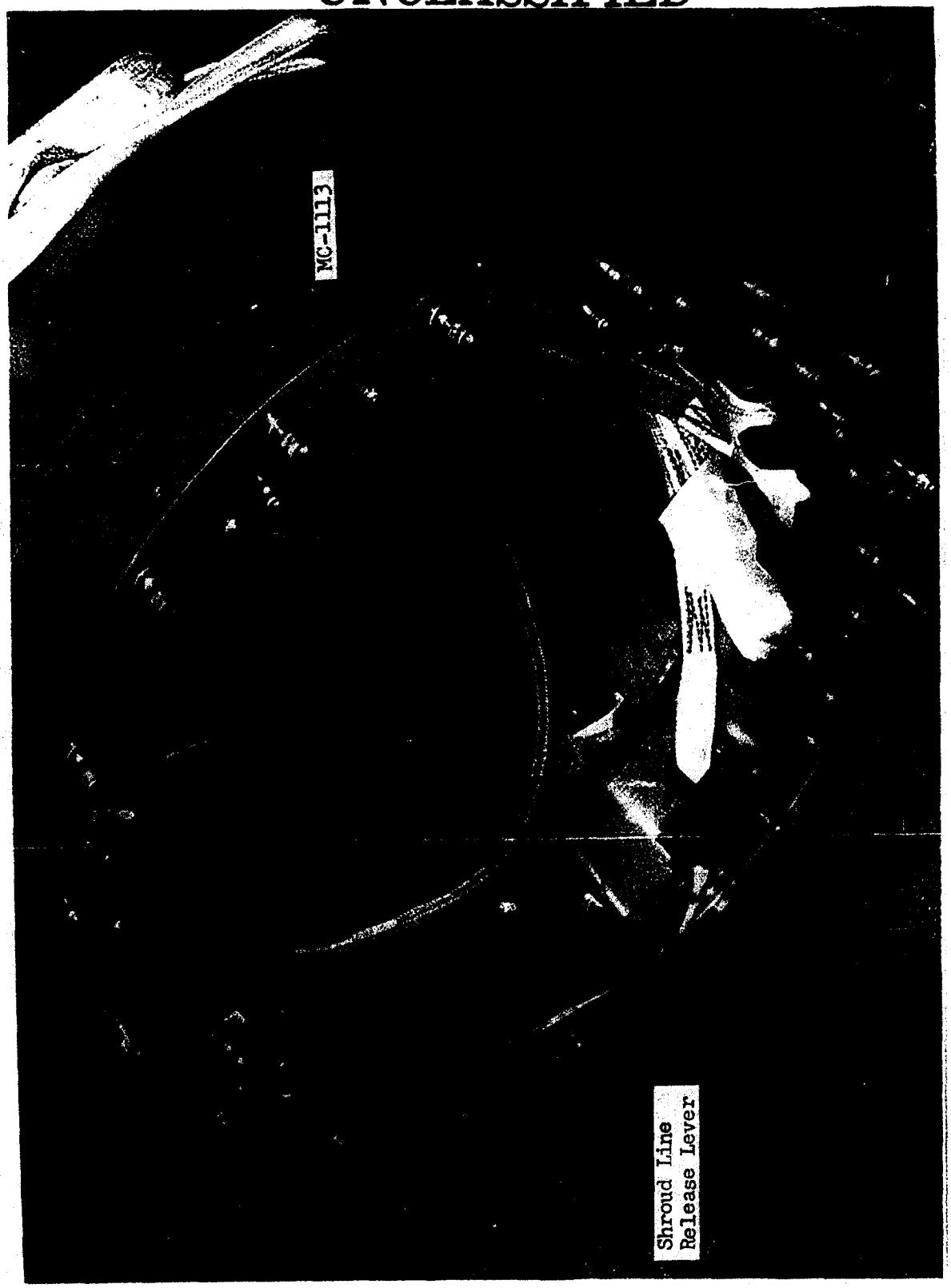

Figure 6 - - Failure of MC-1113 -- Static Test of Release Assembly.

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TABLE I

Measured Strains and Calculated Stresses - Static Test of Release Assembly

Strain (microinches per inch)

Load (pounds)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24,000	-6	-142				-81					-1,040	282	-1,030	478	-694	638	-114	-17	-123	-100	-278	-73
48,000	-12	-311				-213					-2,430	585	-2,790	1,070	-3,140	1,650	-200	-16	-246	-180	-586	-138
60,000	-26	-392				-270					-3,160	770	-3,660	1,410	-4,290	2,230	-237	-23	-317	-219	-753	-175
68,000	-43	-445				-306					-3,610	920	-4,250	1,660	-5,240	2,760	-261	-29	-368	-248	-877	-205
76,000	-51	-498				-344					-4,150	1,080	-5,240	1,900	-6,920	3,510	-282	-31	-419	-274	-950	-235

Load (pounds)	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24,000	-452	-39	-708	12	-1,010	262	-1,040	457	-924	770	924	-202	-79	-115	37	-294	595	-205	616	-327	100	-229
48,000	-977	-73	-1,520	42	-2,250	557	-2,520	968	-2,860	1,540	1,960	-371	2,050	-245	1,590	-375	1,590	-450	1,710	-753	1,120	-765
60,000	-1,230	-97	-1,970	55	-2,900	720	-3,320	1,310	-3,780	2,110	2,420	-470	2,700	-1,110	2,220	-1,170	2,120	-560	2,330	-992	1,670	-1,000
68,000	-1,440	-126	-3,320	48	-3,430	840	-3,890	1,520	-4,420	2,470	2,760	-571	3,190	-1,300	2,650	-1,390	2,510	-652	2,770	-1,180	2,010	-1,250
76,000	-1,670	-148	-2,720	45	-4,010	960	-4,750	1,780	-5,340	3,[illegible]	3,130	-654	3,760	-1,520	3,170	-1,650	2,970	-724	3,320	-1,380	2,440	-1,460

Stress (psi)

Load (pounds)	1 Su	1 Sv	2 Su	2 Sv	3 Su	3 Sv	4 Su	4 Sv	5 Su	5 Sv	6 Su	6 Sv	7 Su	7 Sv	8 Su	8 Sv	9 Su	9 Sv	10 Su	10 Sv	11 Su	11 Sv
0	0	0	0										0	0	0	0	0	0	0	0	0	0
24,000	-600	-1,600									-11,620	-577	-23,790	1,577	-5,330	4,500	-1,340	-610	-1,750	-1,570	-3,190	-1,840
48,000	-1,270	-3,530									-24,150	-2,186	-27,310	1,727	-25,130	6,340	-2,330	-420	-3,420	-2,900	-7,360	-3,710
60,000	-1,730	-4,500									-12,530	-3,[illegible]	-35,[illegible]	2,[illegible]	-31,[illegible]	-.21	-2,740	-1,130	-4,460	-3,680	-9,[illegible]	-4,730
68,000	-2,120	-5,150									-[illegible]	-2,[illegible]	-41,510	2,770	-48,580	11,660	-3,140	-1,300	-5,040	-4,130	-11,580	-5,530
76,000	-2,410	-5,770									-2,650	-3,160	-43,190	3,760	-63,170	15,370	-3,390	-1,390	-5,[illegible]	-4,610	-13,520	-6,150

Load (pounds)	12 Su	12 Sv	13 Su	13 Sv	14 Su	14 Sv	15 Su	15 Sv	16 Su	16 Sv	17 Su	17 Sv	18 Su	18 Sv	19 Su	19 Sv	20 Su	20 Sv	21 Su	21 Sv	22 Su	22 Sv
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24,000	-5,210	-2,100	-7,900	-2,450	-12,360	-780	-9,380	1,290	-7,780	4,450	4,620	1,140	1,230	-1,660	40	-2,920	5,930	220	5,700	-1,390	280	-2,200
48,000	-11,220	-4,420	-16,890	-5,120	-23,170	-2,040	-24,570	1,920	-26,220	7,860	13,470	2,660	15,860	-1,[illegible]	14,600	-3,950	15,240	740	16,360	-2,260	13,120	-[illegible]
60,000	-14,150	-5,620	-21,880	-6,630	-29,860	-2,600	-32,400	2,460	-34,460	9,630	25,140	3,460	26,220	-2,390	20,580	-4,950	21,700	1,520	22,470	-2,550	15,040	-5,060
68,000	-16,600	-6,940	-37,040	-11,680	-35,350	-3,200	-38,010	2,730	-40,460	11,420	29,840	3,760	30,980	-2,830	24,550	-5,530	25,750	1,330	26,710	-1,240	17,930	-6,610
76,000	-19,260	-7,810	-30,320	-9,500	-41,420	-3,910	-46,700	2,470	-48,560	14,760	32,630	4,190	35,560	-3,2[illegible]	29,470	-6,330	30,630	2,310	32,140	-1,250	21,20[illegible]	-7,130

Su = Stress in direction of lowest numbered gage in biaxial pair.
Sv = Stress in direction of highest numbered gage in biaxial pair.

- = Compression.
+ = Tension.

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