[redacted]

1479

APR 9 1958

Case No. 746.00
Ref. Sym: 1612 (699)
Project No. TM-748
File: TX-41, 3-2

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
1st Review Date: 9/22/98
Authority: ADD
Name: RB Cranes
2nd Review Date: 9/24/98
Authority: ADD
Name: WC Layne
Determination (Circle Numbers):
1. Classification Retained
2. Classification Changed to: U
3. Contains No DOE Classified Information
4. Coordinate With:
5. Contains UCAI?
6. Comments: OK for Operat

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MR. P. E. JOCKLE - 1218

Attn: Mr. T. L. Bills - 1218

Re: Hydrostatic Overpressure Test of TX-41 Nose Fairing

COL. No.
ACCOUNTABILITY CARD
FILE No. TX-41 3-2

Summary of Results

The TX-41 nose fairing when subjected to a hydrostatic overpressure test of 44 psi showed no indication of failure or yielding. The maximum deflection at the center of the nose fairing at 37.8 psi overpressure was .439 inch and the maximum stress indicated by the strain gages at this location was 20,168 psi at 44 psi overpressure.

Object of Test

The object of this test was to subject the TX-41 nose fairing to a hydrostatic overpressure test of 45 psi and record stresses and deflections at the locations designated by the consultant.

Reason for Test

The test was authorized in a Work Order Authorization from H. F. Howard, 1218, to P. H. Adams, 1612, Attn: E. White, 1612-2, dated December 10, 1957.

Summary of Past Tests

No previous static tests have been run on the TX-41 nose fairing by Division 1612.

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Setup for Test

I. Figure 1 is a sketch of the test setup.

II. The item tested was one TX-41 nose fairing (Dwg. No. 140303)

III. The following equipment was used in the test:

1. Pressure vessel.
2. One Consolidated pressure cell, 150 psi capacity.
3. One Fairchild strain indicator.

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
DOWNGRADING OR DECLASSIFICATION STAMP
CLASSIFICATION CHANGED TO: U
AUTHORITY: W. C. Layne
Emilda Selph 9/28/98
PERSON CHANGING MARKING & DATE
RECORD ID: 98SN4461
WC Layne 9/28/98
PERSON VERIFYING MARKING & DATE
DATED: 9/24/98

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IV. The following instrumentation was used:

1. Twenty-four A-7 strain gages, Res. 120.5 ± .3, G.F. 1.97, Lot No. 32 PG 24.
2. Eight Starrett dial indicators, least graduation .001 inch.

Procedure

The TX-41 nose fairing was instrumented with strain gages at the locations designated by the consultant as shown in Fig. 2. The nose fairing was then attached to the base plate of the pressure vessel and eight dial indicators were mounted as shown in Fig. 1 and at the locations shown in Fig. 2. The pressure vessel was mounted over the nose fairing and filled with water. The pressure vessel was connected to the water supply through a small orifice valve which was used to control the pressure in the pressure vessel. The access door in the nose fairing was sealed by cementing a piece of rubber over the outside of the door. Pressure was measured by means of a Consolidated pressure cell. Pressure was increased in increments up to 44 psi and strain readings and deflection readings were taken at each increment of load. The test was stopped at 44 psi because the pressure vessel began leaking excessively. The consultant felt that 44 psi was sufficient. It was not possible to record a complete set of strain or deflection readings at 44 psi.

Results

The TX-41 nose fairing when subjected to a hydrostatic overpressure test showed no indication of failure or yielding when pressurized to 44 psi. Maximum stress recorded at the strain gage locations at 44 psi was 20,168 psi and was located in the center of the nose fairing under gages 7, 8, and 9 (see Fig. 2). Maximum deflection at 37.8 psi was .439 inch at dial indicator location No. 5 which was located at the center of the nose fairing (see Fig. 2). Recorded load-strain data and computed maximum and minimum principal stresses are listed in Tables I and II. Recorded load-deflection data is listed in Table III.

Conclusions

The TX-41 nose fairing tested was structurally adequate to withstand a hydrostatic overpressure test of 44 psi.

L. J. Woolrich

L. J. WOOLRICH - 1612-2

Approved by: Paul H. Adams

PAUL H. ADAMS - 1612

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APR 9 1958

Ref. Sym: 1612 (699)
Project No. TM-748

Mr. P. E. Jockle - 1218

-3-

LJW:1612-2:as

Copy to:
W. A. Gardner, 1610
D. M. Bruce, 1282
C. L. Gomel, 5523
R. K. Smeltzer, 7221-3

[redacted]

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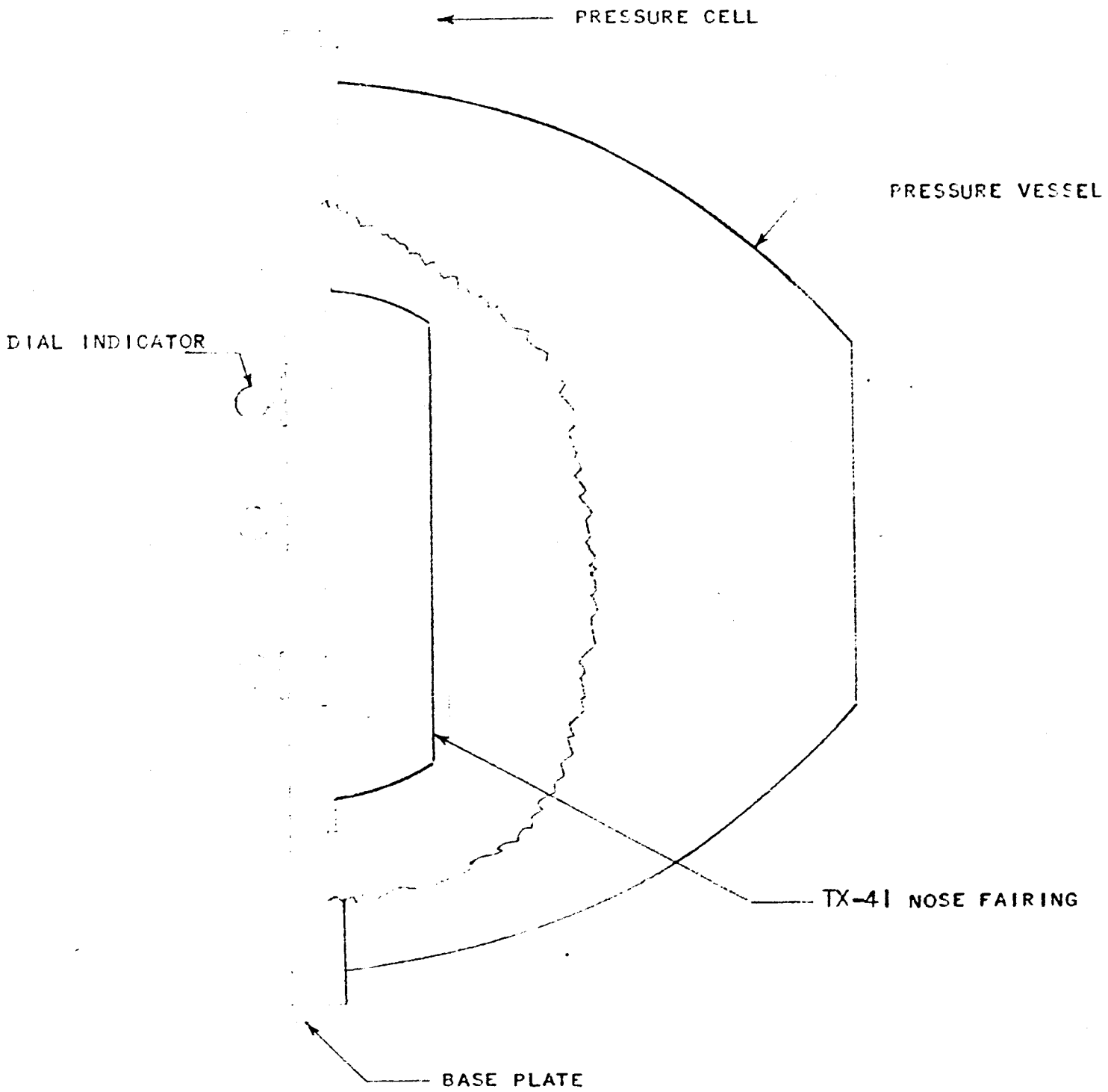


FIG. 1 -- TEST SETUP ILLUSTRATING MANNER IN WHICH DIAL INDICATORS WERE MOUNTED IN HYDROSTATIC OVERPRESSURE TEST OF TX-41 NOSE FAIRING.

REF. SYM: 1612 (699)
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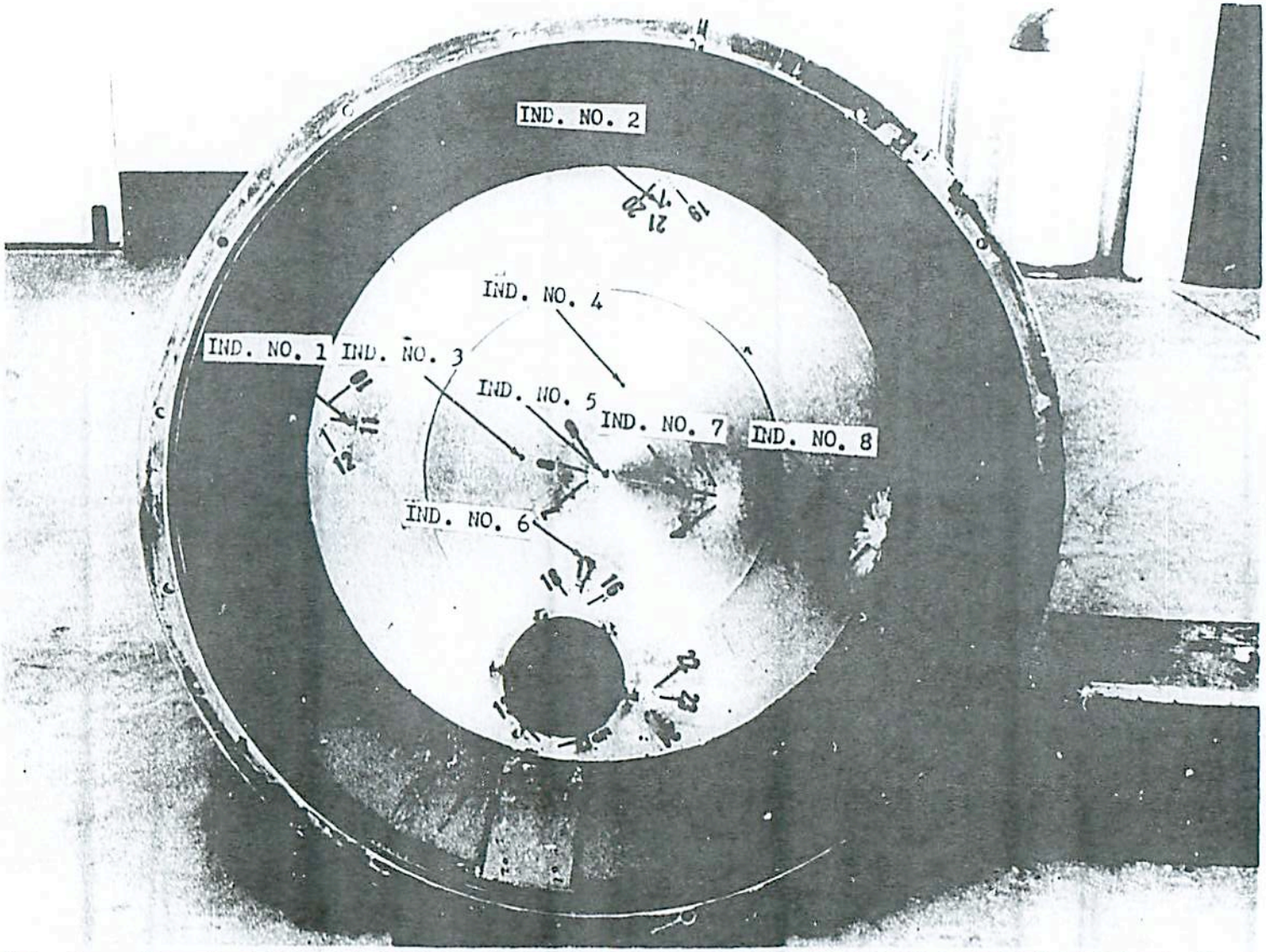


FIG. 2 -- STRAIN GAGE LOCATIONS AND DIAL INDICATOR LOCATIONS ON UNDERSIDE OF TX-41 NOSE FAIRING IN HYDROSTATIC OVERPRESSURE TEST OF TX-41 NOSE FAIRING.

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REF. SYM: 1612 (699)
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TABLE I

LOAD-STRAIN DATA IN HYDROSTATIC OVERPRESSURE TEST OF TX-41 NOSE FAIRING

Strain (Microinches per Inch)

| Load (psi) | Gage Nos. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.2 | -30 | -100 | -20 | +60 | +60 | +65 | +70 | +80 | +30 | -15 | -60 | -20 |
| 6.4 | -60 | -190 | -40 | +120 | +120 | +135 | +140 | +165 | +160 | -30 | -145 | -40 |
| 9.6 | -80 | -280 | -70 | +200 | +190 | +210 | +230 | +260 | +255 | -40 | -210 | -60 |
| 12.8 | -100 | -370 | -90 | +270 | +270 | +300 | +310 | +360 | +340 | -80 | -290 | -80 |
| 16.0 | -135 | -470 | -110 | +350 | +360 | +380 | +410 | +475 | +440 | -70 | -360 | -110 |
| 17.6 | -145 | -510 | -120 | +390 | +390 | +430 | +450 | +525 | +490 | -80 | -400 | -120 |
| 19.2 | -160 | -550 | -140 | +440 | +450 | +480 | +510 | +590 | +550 | -90 | -430 | -130 |
| 20.0 | -170 | -580 | -140 | +450 | +460 | +500 | +530 | +620 | +575 | -90 | -450 | -140 |
| 22.0 | -190 | -630 | -150 | +500 | +510 | +550 | +585 | +680 | +630 | -100 | -490 | -150 |
| 26.6 | -240 | -720 | -190 | +620 | +640 | +690 | +710 | +860 | +780 | -130 | -580 | -190 |
| 27.5 | -250 | -780 | -200 | +650 | +670 | +720 | +740 | +890 | +800 | -140 | -600 | -200 |
| 30.3 | -280 | -840 | -210 | +720 | +760 | +810 | +820 | +980 | +880 | -140 | -650 | -210 |
| 0 | 0 | -10 | 0 | 0 | 0 | 0 | -20 | +5 | -20 | 0 | 0 | 0 |
| 33.0 | -300 | -910 | -240 | +800 | +850 | +890 | +900 | +1080 | +970 | -160 | -710 | -240 |
| 34.4 | -320 | -940 | -250 | +840 | +890 | +940 | +940 | +1140 | +1030 | -170 | -730 | -250 |
| 37.3 | -340 | -1010 | -270 | +950 | +1010 | +1060 | +1050 | +1260 | +1120 | -180 | -780 | -270 |
| 44.0 | -360 | -1080 | -290 | +1000 | +1170 | +1220 | +1160 | +1420 | +1200 | | | |

Strain (Microinches per Inch)

| Load (psi) | Gage Nos. 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.2 | -20 | -30 | -30 | +60 | +70 | -10 | -15 | -80 | -20 | +90 | 0 | +100 |
| 6.4 | -50 | -70 | -75 | +120 | +150 | -20 | -45 | -170 | -50 | +190 | -10 | -220 |
| 9.6 | -100 | -100 | -130 | +190 | +240 | -30 | -80 | -260 | -80 | +295 | -10 | -340 |
| 12.8 | -130 | -140 | -180 | +280 | +325 | -40 | -110 | -350 | -110 | +400 | -10 | -460 |
| 16.0 | -210 | -180 | -255 | +320 | +390 | -50 | -140 | -430 | -145 | +510 | -10 | -570 |
| 17.6 | -240 | -190 | -270 | +370 | +470 | -50 | -150 | -480 | -160 | +570 | -10 | -630 |
| 19.2 | -270 | -200 | -300 | +400 | +530 | -55 | -170 | -520 | -180 | +630 | -10 | -690 |
| 20.0 | -290 | -210 | -320 | +420 | +550 | -55 | -180 | -550 | -185 | +660 | -10 | -710 |
| 22.0 | -330 | -220 | -350 | +460 | +610 | -55 | -200 | -590 | -210 | +720 | -10 | -780 |
| 26.6 | -440 | -270 | -460 | +560 | +760 | -60 | -250 | -720 | -250 | +910 | -10 | -920 |
| 27.5 | -460 | -280 | -470 | +590 | +730 | -50 | -250 | -720 | -260 | +940 | 0 | -955 |
| 30.3 | -510 | -320 | -540 | +630 | +860 | -50 | -270 | -790 | -280 | +1010 | 0 | -1000 |
| 0 | 0 | -10 | -10 | +10 | +25 | 0 | 0 | +5 | 0 | +10 | 0 | -20 |
| 33.0 | -590 | -420 | -670 | +710 | +970 | -50 | -300 | -860 | -310 | +1140 | 0 | -1120 |
| 34.4 | -630 | -450 | -710 | +740 | +1000 | -50 | -320 | -890 | -330 | +1210 | 0 | -1160 |
| 37.3 | -730 | -550 | -840 | +830 | +1120 | -30 | -340 | -960 | -390 | +1350 | +10 | -1240 |
| 44.0 | | | | | | | | | | | | |

+ denotes tension.
- denotes compression.

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TABLE II

COMPUTED MAXIMUM AND MINIMUM STRESSES IN
HYDROSTATIC OVERPRESSURE OF TX-41 NOSE FAIRING

| Load (psi) | Rosette 1 Gages 1,2,3 Su | Rosette 1 Gages 1,2,3 Sv | Rosette 2 Gages 4,5,6 Su | Rosette 2 Gages 4,5,6 Sv | Rosette 3 Gages 7,8,9 Su | Rosette 3 Gages 7,8,9 Sv | Rosette 4 Gages 10,11,12 Su | Rosette 4 Gages 10,11,12 Sv |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.2 | 143 | -964 | 998 | 943 | 1219 | 1110 | 55 | -598 |
| 6.4 | 300 | -1852 | 2061 | 1898 | 2467 | 2191 | 301 | -1383 |
| 9.6 | 408 | -2737 | 3304 | 3062 | 3930 | 3600 | 453 | -2005 |
| 12.8 | 634 | -3584 | 4528 | 4263 | 5338 | 4754 | 368 | -2852 |
| 16.0 | 764 | -4568 | 5789 | 5546 | 6999 | 6199 | 678 | -3473 |
| 17.6 | 839 | -4953 | 6583 | 6149 | 7746 | 6849 | 752 | -3858 |
| 19.2 | 739 | -5397 | 7314 | 6971 | 8714 | 7744 | 750 | -4166 |
| 20.8 | 854 | -5667 | 7599 | 7152 | 9124 | 8033 | 799 | -4361 |
| 22.0 | 891 | -6170 | 8375 | 7928 | 10015 | 8851 | 864 | -4746 |
| 26.6 | 538 | -7215 | 10462 | 9878 | 12439 | 10646 | 744 | -5713 |
| 27.5 | 766 | -7753 | 10928 | 10344 | 12904 | 11007 | 665 | -5944 |
| 30.3 | 766 | -8374 | 12225 | 11531 | 14221 | 12175 | 934 | -6369 |
| 0 | 77 | -77 | 0 | 0 | -119 | -502 | 0 | 0 |
| 33.0 | 720 | -9195 | 13467 | 12773 | 15661 | 13374 | 817 | -7028 |
| 34.4 | 604 | -9454 | 14202 | 13436 | 16531 | 14057 | 738 | -7259 |
| 37.8 | 676 | -10148 | 16028 | 15181 | 18215 | 15478 | 776 | -7763 |
| 44.0 | 749 | -10841 | 18445 | 17422 | 20168 | 16475 | Gage Out | |

| Load (psi) | Rosette 5 Gages 13,14,15 Su | Rosette 5 Gages 13,14,15 Sv | Rosette 6 Gages 16,17,18 Su | Rosette 6 Gages 16,17,18 Sv | Rosette 7 Gages 19,20,21 Su | Rosette 7 Gages 19,20,21 Sv | Rosette 8 Gages 22,23,24 Su | Rosette 8 Gages 22,23,24 Sv |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3.2 | -334 | -442 | 825 | -49 | 203 | -751 | 2204 | 746 |
| 6.4 | -359 | -1082 | 1712 | -160 | 202 | -1677 | 1339 | -1805 |
| 9.6 | -1623 | -1948 | 2731 | -247 | 138 | -2622 | 2037 | -2786 |
| 12.8 | -2183 | -2630 | 3357 | -131 | 132 | -3548 | 2835 | -3766 |
| 16.0 | -3172 | -4048 | 4512 | -319 | -8 | -4417 | 3677 | -4609 |
| 17.6 | -3448 | -4471 | 5355 | -386 | 85 | -4899 | 4137 | -5069 |
| 19.2 | -3764 | -5087 | 5927 | -570 | -72 | -5363 | 4597 | -5528 |
| 20.8 | -3994 | -5473 | 6188 | -521 | -16 | -5651 | 4865 | -5641 |
| 22.0 | -4356 | -6202 | 6840 | -552 | -231 | -6135 | 5286 | -6219 |
| 26.6 | -5605 | -8360 | 8458 | -694 | -279 | -7485 | 6939 | -7093 |
| 27.5 | -5801 | -8639 | 8743 | -514 | -394 | -7525 | 7148 | -7381 |
| 30.3 | -6576 | -9728 | 4186 | -14744 | -321 | -8219 | 7733 | -7628 |
| 0 | -23 | -132 | 236 | -90 | 38 | -38 | 44 | -199 |
| 33.0 | -8143 | -11421 | 10830 | -583 | -430 | -8991 | 8319 | -8509 |
| 34.4 | -9689 | -12117 | 11221 | -508 | -714 | -9378 | 9476 | -8619 |
| 37.8 | -10434 | -14254 | 12640 | -219 | -1192 | -10233 | 10739 | -9981 |
| 44.0 | Gage Out | | Gage Out | | Gage Out | | Gage Out | |

+ denotes tension
- denotes compression

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TABLE III

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LOAD-DEFLECTION DATA IN HYDROSTATIC OVERPRESSURE TEST OF TX-41 NOSE FAIRING

| Load (psi) | Deflection (Inches) Dial Indicator Nos.* 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 0 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| 3.2 | .001 | .000 | .012 | .014 | .031 | .020 | .004 | .000 |
| 6.4 | .012 | .000 | .021 | .050 | .064 | .052 | .034 | .000 |
| 9.6 | .026 | .001 | .035 | .080 | .103 | .088 | .068 | .009 |
| 12.8 | .033 | .003 | .036 | .111 | .140 | .121 | .099 | .010 |
| 16.0 | .047 | .007 | .119 | .143 | .176 | .154 | .132 | .019 |
| 17.6 | .047 | .008 | .135 | .160 | .196 | .173 | .148 | .021 |
| 19.2 | .050 | .010 | .149 | .180 | .218 | .196 | .169 | .030 |
| 20.8 | .053 | .010 | .157 | .188 | .228 | .201 | .176 | .030 |
| 22.0 | .059 | .012 | .177 | .206 | .247 | .221 | .193 | .040 |
| 26.6 | .077 | .023 | .227 | .254 | .304 | .272 | .194 | .051 |
| 27.6 | .078 | .023 | .234 | .264 | .315 | .279 | .194 | .051 |
| 30.3 | .088 | .025 | .260 | .298 | .348 | .308 | .222 | .061 |
| 0 | -.012 | -.018 | -.008 | .030 | .009 | .022 | -.041 | .054 |
| 33.0 | .100 | .035 | .281 | .324 | .379 | .347 | .252 | .070 |
| 34.4 | .105 | .036 | .299 | .341 | .397 | .362 | .266 | .070 |
| 37.3 | .114 | .041 | .331 | .378 | .439 | .399 | .304 | .080 |
| 0 | .008 | -.016 | .000 | .028 | .028 | .064 | -.063 | .098 |

* Dial indicator locations are shown in Fig. 2.

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