LOFT TECHNICAL REPORT LTR 1144-38

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MASTER

ANALYSIS OF LOFT PRESSURIZER SPRAY AND SURGE NOZZLES TO INCLUDE A 450°F STEP TRANSIENT

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DEPARTMENT OF ENERGY

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IDAHO NATIONAL ENGINEERING LABORATORY
LOFT TECHNICAL REPORT
LOFT PROGRAM

TITLE	REPORT NO.
Analysis of LOFT Pressurizer Spray and Surge Nozzles to Include a 450°F Step Transient	RE-A-78-012
AUTHOR: M. E. Nitzel	GWA NO.
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ABSTRACT

This report presents the analysis of the LOFT pressurizer spray and surge nozzles to include a 450°F step thermal transient. Previous analysis performed under subcontract by Basic Technology Incorporated was utilized where applicable. The SAASIII finite element computer program was used to determine stress distributions in the nozzles due to the step transient. Computer results were then incorporated in the necessary additional calculations to ascertain that stress limitations were not exceeded. The results of the analysis described in this report indicate that both the spray and surge nozzles will be within stress allowables prescribed by subsubarticle NB-3220 of the 1974 edition of the ASME Boiler and Pressure Vessel Code when subjected to currently known design, normal operating, upset, emergency, and faulted condition loads.

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1.0 INTRODUCTION

The currently planned low power physics tests will result in an additional thermal transient being applied to the LOFT pressurizer spray and surge nozzles. This report describes the reanalysis of these nozzles to include the effects of this 450°F thermal step transient.

The spray and surge nozzle configurations shown in Aerojet Nuclear Company (ANC) drawing 204240, Revision C,[1] were analyzed by Basic Technology Incorporated (BTI)[2]. The overall configurations of these nozzles are shown in Figures 1 and 2. The reference 1 drawing shows additional detail.

Section III, Subsection NB[3] of the ASME Boiler and Pressure Vessel Code (hereafter referred to as "The Code") was used to define structural adequacy criteria. Design, normal operating, upset, emergency, and faulted conditions were considered in this analysis. As described in Section 2.0, the SAAS III computer program was used to analyze both nozzles for the 450°F step transient. The result of the SAAS III analysis were then combined with the BTI results to calculate new cumulative usage factors. Design conditions were specified to be P = 2500 psi and T = 683°F; while operating conditions were P = 2250 psi and T = 653°F. The spray nozzle is constructed of inconel (SB-167). The surge nozzle piping connection and thermal liner materials are inconel (SB-167), while the remainder of the surge nozzle is constructed of carbon steel (SA-105, GR II). A complete tabulation of the material properties used in this additional analysis is shown in Section 2.2.

It should be noted that the finite element models used in this analysis were developed by D. H. VanHaaften of the Thermal Analysis Branch in conjunction with the analysis reported in Reference 5.

The SAAS III computer run of the spray nozzle was completed by

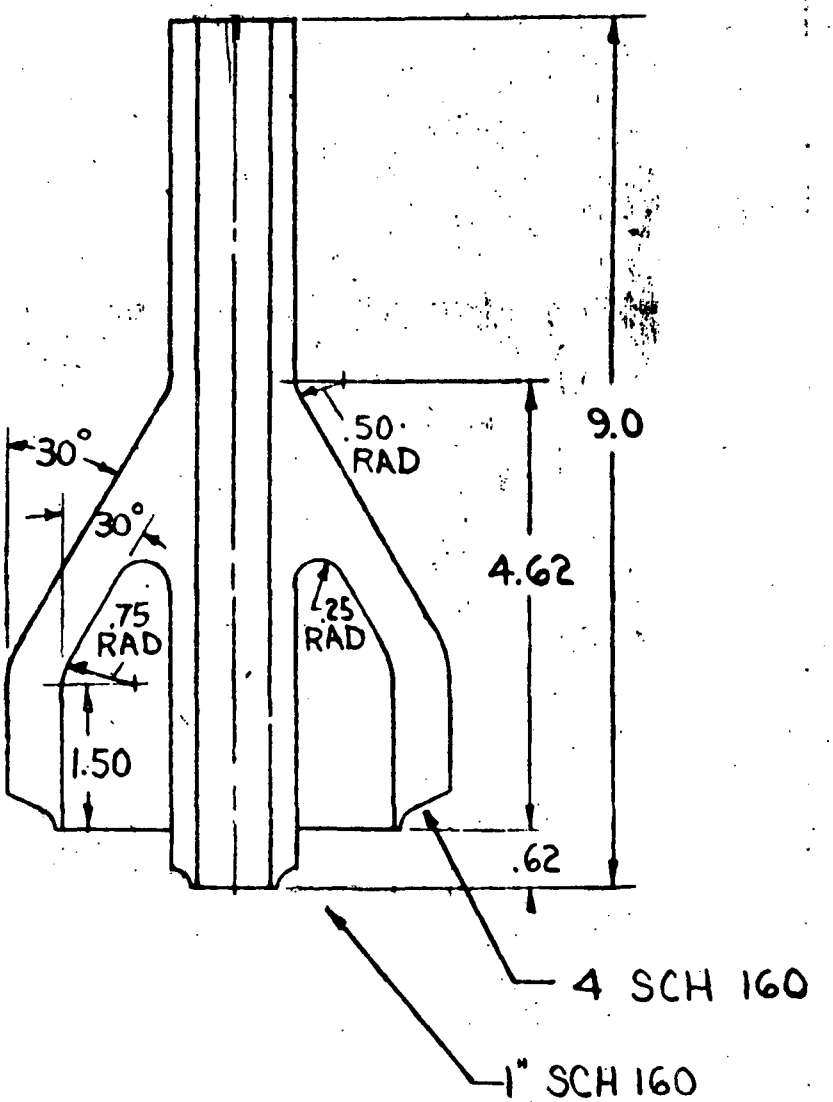


FIGURE 1

LOFT Pressurizer Spray Nozzle

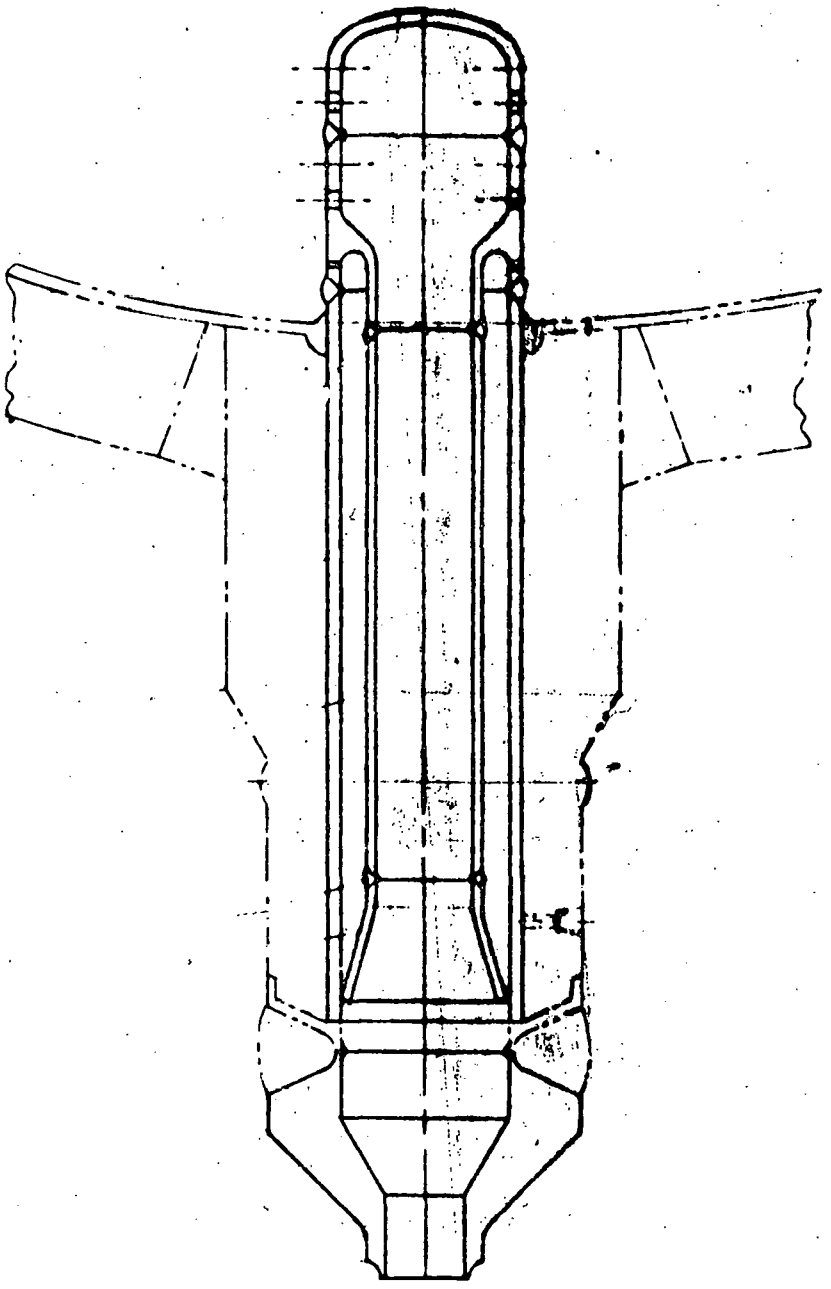


FIGURE 2

LOFT Pressurizer Surge Nozzle and
Thermal Shield Assembly

Mr. J. W. Muffett. All other original analysis shown in this report was completed by the author.

2.0 ANALYSIS

The following subsections describe all phases of the additional analysis performed on the LOFT pressurizer spray and surge nozzles. As previously noted, results from the BTI[2] analysis were used in conjunction with the additional analysis.

2.1 Structural Adequacy Criteria

Paragraph NB-3221[3] defines stress intensity limits for design conditions of Class 1 components. Paragraphs NB-3222, NB-3223, NB-3224, and NB-3225 define stress limits for normal operating, upset, emergency, and faulted conditions respectively. These guidelines were followed throughout the additional spray and surge nozzle analysis shown in this report.

2.2 Material Properties and Allowables

All material properties and allowable S_M values used in the additional analysis of the spray and surge nozzles are shown in Table I.

2.3 ASME Code Analysis

2.3.1 Design Conditions

Design conditions for the spray and surge nozzles are P = 2500 psi and T = 683°F. Paragraph NB-3221[3] was used to define structural adequacy criteria for both items. Any design condition calculations not previously completed in the BTI analysis are shown in Appendices A and B for the spray and surge nozzles, respectively.

2.3.2 Normal Conditions

The majority of the additional analysis necessitated

TABLE 1
LOFT SPRAY AND SURGE NOZZLE MATERIAL PROPERTIES

MATERIAL	PROPERTY	TEMPERATURE ~°F 100	200	400	600	650	700
STAINLESS STEEL (SA-182, F316L)	E	28.2	27.7	26.6	25.4	25.1	24.8
	α	9.16	9.34	9.59	9.82	9.87	9.93
	S_y	25.0	21.1	17.2	15.0	14.6	14.3
	S_M	16.6	16.6	15.5	13.5	13.2	12.8
INCONEL (SB-167)	E	31.5	30.9	30.0	29.2	28.9	28.6
	α	7.2	7.4	7.7	7.9	7.95	8.00
	S_y	25.0	23.0	21.0	19.8	19.7	19.7
	S_M	16.6	16.6	16.6	16.6	16.6	16.6
CARBON STEEL (A105 GR II)	E	27.8	27.7	27.0	25.7	25.25	24.8
	α	6.13	6.38	6.82	7.23	7.33	7.44
	S_y	36.0	32.8	30.8	26.6	26.1	25.9
	S_M	23.3	21.9	20.6	17.8	17.4	17.3
AIR (USED TO MODEL GAP BETWEEN SURGE NOZZLE AND THERMAL SHIELD)	E	1.0	1.0	1.0	1.0	1.0	1.0
	α	0.0	0.0	0.0	0.0	0.0	0.0
	S_y	0.0	0.0	0.0	0.0	0.0	0.0
	S_M	0.0	0.0	0.0	0.0	0.0	0.0

NOTE - UNITS ARE: E ~ 10^6 PSI, α ~ 10^{-6} IN./IN./°F, S_y ~ KSI, S_M ~ KSI

by the addition of the 450°F thermal step transient involved fatigue life calculations considering all transient load cases which are likely to occur during normal operating conditions. Paragraph NB-3222[3] was used to define stress limits for all normal operating condition stress categories and to define the procedure for cyclic analysis. The SAAS III finite element computer program was used with the results of the thermal analysis reported in Reference 5 to calculate the stress distribution in the spray and surge nozzles due to the 450°F step transient.

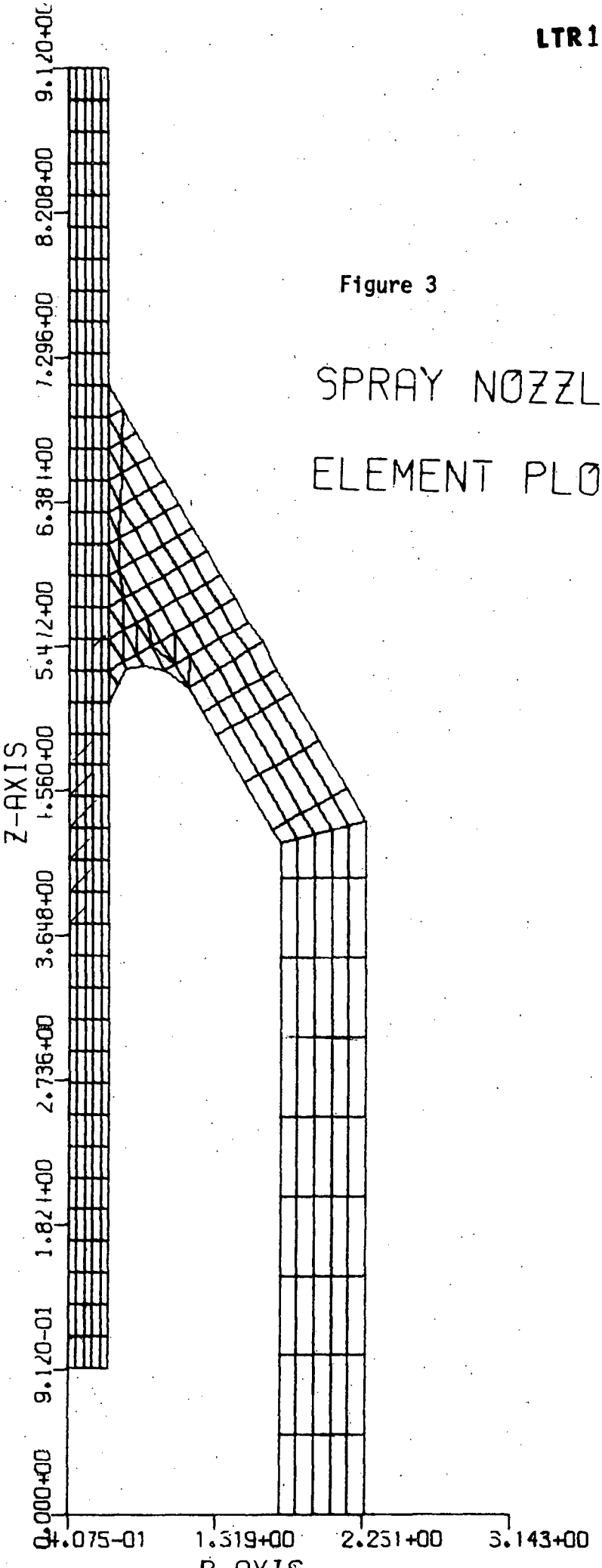
Simplified plots of the finite element mesh used for each of the spray and surge nozzles are shown in Figures 3 and 4.

The reader may refer to Appendices A and B (Spray and Surge Nozzle Calculations, respectively) for more detailed information concerning node and element numbering and other pertinent calculations. SAAS III spray nozzle output is shown in Appendix C, while a microfiche copy of the surge nozzle output is included in Appendix E. Results of the SAAS III analysis were used to ascertain that all normal condition stress requirements were satisfied. The computer program INTENS was used to calculate alternating stress intensities for all transient load set combinations as required for the cyclic analysis. Cumulative usage factors were calculated for each nozzle. As previously stated, calculations performed for the spray and surge nozzles, including the INTENS program output, are shown in Appendices A and B respectively. A complete listing of the INTENS computer program is shown in Appendix D. A microfiche copy of SAAS III

Figure 3

SPRAY NOZZLE

ELEMENT PLOT



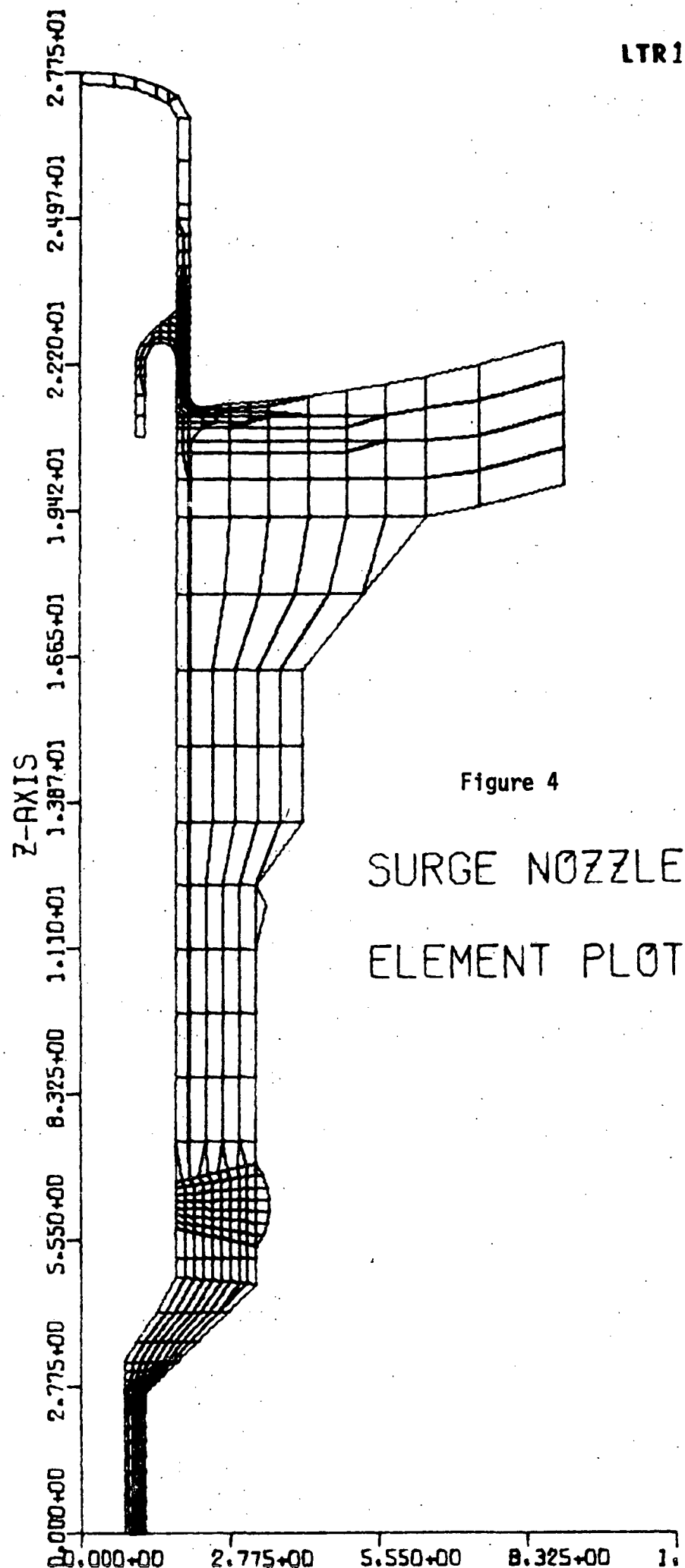


Figure 4

SURGE NOZZLE

ELEMENT PLOT

may be found in Appendix E.

2.3.3 Emergency Conditions

Paragraph NB-3224(3) defines stress limits to be used in the analysis of emergency conditions. Safe shutdown earthquake (SSE) loads were the only additional emergency condition loads considered. All calculations necessary for the satisfaction of stress limits in this section are shown in Appendices A and B for the spray and surge nozzles respectively.

2.3.4 Faulted Conditions

Paragraph NB-3225(3) defines stress limits and allowable procedures to be used in the analysis of faulted conditions. Loss of Coolant Accident (LOCA) plus SSE loads were considered to be faulted condition loads. Since LOCA loads were not reported in Reference 2 for the spray nozzle, Loss of Coolant Experiment (LOCE) loads were assumed to be equivalent to LOCA loads for analysis purposes. Thus, LOCE plus SSE loads were used for faulted conditions on the spray nozzle. Reference 6 is an example of previous piping analysis that has shown this procedure to be acceptable. All faulted condition calculations necessary for the satisfaction of stress limits are shown in Appendices A and B for the spray and surge nozzles respectively.

3.0 RESULTS

The results of the analysis described in the preceeding pages shows that both the spray and surge nozzles are within allowable stress limits prescribed by the ASME code. Maximum stresses for the various operating conditions are summarized in Table 2. As can be seen from the table, the primary plus secondary stresses were above the allowable

TABLE 2

STRESS SUMMARY

NOZZLE	CONDITION	STRESS CATEGORY	MAX. STRESS	LIMIT
SPRAY	DESIGN	GENERAL PRIMARY MEMBRANE	5,215	S_M = 13,200
SURGE	DESIGN	↓ ↓ ↓	7,268	S_M = 16,600
SPRAY	NORMAL & UPSET	PRIMARY + SECONDARY	40,875	$3S_M$ = 39,600
SURGE	NORMAL & UPSET	↓ ↓	85,100	$3S_M$ = 49,800
SPRAY	EMERGENCY	GENERAL PRIMARY MEMBRANE	1,719	$1.2S_M$ = 15,340
SURGE	EMERGENCY	↓ ↓ ↓	6580	$1.2S_M$ = 19,920
SPRAY	FAULTED	↓ ↓ ↓	2,901	$2.4S_M$ = 31,680
SURGE	FAULTED	↓ ↓ ↓	8,540	$2.4S_M$ = 39,840

NOTE - STRESSES AND LIMITS IN PSI

limits for both nozzles for normal operating and upset conditions. As shown in Appendices A and B, a simplified elastic-plastic analysis was performed to show that both nozzles comply with code requirements. The normal and upset condition cyclic analysis yielded the following results:

Nozzle	Cumulative Usage Factor	Limit
Spray	0.0027	1.0
Surge	0.6095	1.0

4.0 CONCLUSIONS

The LOFT pressurizer spray and surge nozzles have been reanalyzed to include the effects of a 450°F step thermal transient. From the analysis presented above it can be concluded that both the spray and surge nozzles will comply with all requirements as set forth in subarticle NB-3220 of the ASME code.

5.0 REFERENCES

1. Aerojet Nuclear Company, Drawing 204240, Revision C, "Pressurizer Nozzles", April 10, 1972.

2. G. V. Thompson, et.al., "Stress Report on LOFT Pressurizer", Basic Technology Inc., BTI Report 72083, July 31, 1973.

3. American Society of Mechanical Engineers, ASME Boiler and Pressure Vessel Code, Section III, Division 1, "Nuclear Power Plant Components", Subsection NB, 1974 Edition plus Summer 1976 Addenda.

4. J. G. Crose and R. M. Jones, SAAS III, Finite Element Stress Analysis of Axisymmetric and Plane Solids with Different Orthotropic, Temperature Dependent Material Properties in Tension and Compression, The Aerospace Corporation, Aerospace Report No. TR-0059(56816-53)-1, June 22, 1971.

5. D. H. VanHaaften, "Steady State and Transient Thermal Analysis of the LOFT Pressurizer Surge and Spray Nozzles," LTR 1144-29, May 2, 1977.

6. J. W. Muffett, "LOFT Pressurizer Pressure Relief Piping System Stress Analysis and Fatigue Life Report," LTR 1144-26, to be published.

APPENDIX A

SPRAY NOZZLE CALCULATIONS

A1

THIS APPENDIX DESCRIBES IN DETAIL THE LOFT PRESSURIZER SPRAY NOZZLE COMPONENT ANALYSIS IN ACCORDANCE WITH SUBARTICLE NB-3200 OF SECTION III OF THE ASME CODE. IT SHOULD BE NOTED THAT ANY REFERENCES CITED IN THIS APPENDIX ARE TAKEN FROM THE MAIN LIST OF REFERENCES IN SECTION 5.0 OF THE BODY OF THE REPORT.

DESIGN CONDITIONS

DESIGN CONDITION STRESS ALLOWABLES ARE DEFINED BY PARAGRAPH NB-3221 OF THE ASME CODE. SINCE THE MAIN THRUST OF THIS ANALYSIS WAS THE INCLUSION OF THE 450°F STEP TRANSIENT IN THE FATIGUE CALCULATIONS, THE DESIGN CONDITION CALCULATIONS SHOWN IN THE BTI REPORT (REFERENCE 2) WERE ACCEPTED AS ADEQUATE. BTI REPORTED A GENERAL PRIMARY MEMBRANE STRESS VALUE OF 5215 PSI. THE ALLOWABLE STRESS VALUE, S_M, FOR SA 182, F316L STAINLESS STEEL AT 683°F IS APPROXIMATELY 13,040 PSI.

NORMAL CONDITIONS

NORMAL CONDITION STRESS ALLOWABLES ARE DEFINED BY PARAGRAPH NB-3222 OF THE ASME CODE. NORMAL OPERATING CONDITIONS ANALYZED CONSIST OF THE FOLLOWING MECHANICAL AND THERMAL LOADS:

MECHANICAL LOADS:

DEAD WEIGHT
POWER RELIEF OPERATING
POWER RELIEF AND SAFETY OPERATING
STEADY STATE OPERATION (OTP)
SPRAY OPERATING
SEISMIC (OBE)
LOCE

A2/

THERMAL LOADS:

450 °F STEP TRANSIENT
LOCE
STEP LOAD REJECTION
LOSS OF SITE POWER
HEAT-UP
COOL DOWN

FROM MATERIAL PRESENTED IN THE SPRAY NOZZLE THERMAL ANALYSIS (REFERENCE 5) IT CAN BE SEEN THAT THE MOST SEVERELY STRESSED AREA WILL BE THE CROTCH REGION AT THE INTERSECTION OF THE INNER SLEEVE AND THE OUTER SHELL. THUS, ONLY THIS REGION WILL BE EXAMINED. AS SHOWN IN THE BTI REPORT (REFERENCE 2), FIGURE 4.2.2-3, THIS INCLUDES ELEMENTS 33-36 AND 81 AND 82 OF THE BTI MODEL.

THE LOADS ON THE NOZZLE AREAS DOCUMENTED IN THE BTI REPORT WITH THE EXCEPTION OF LOCE (MECHANICAL) AND SEISMIC (OBE). THE STRESSES AT THE AREA OF INTEREST HAVE BEEN CALCULATED BY SAASIII FINITE ELEMENT ANALYSIS. THE LOADS FOR THE LOCE AND SEISMIC TRANSIENTS ARE AS CALCULATED FOR THE PIPING CONNECTION AND ARE DOCUMENTED IN REFERENCE 6. THE LOADS, USING THE BTI COORDINATE SYSTEM, ARE AS SHOWN BELOW:

	F_x (LB)	F_y (LB)	F_z (LB)	M_x (IN-LB)	M_y (IN-LB)	M_z (IN-LB)
LOCE (MECH.)	-112	772	84	-244	256	820
SEISMIC (OBE)	-185	467	121	-348	377	1308

THESE LOADS WERE OBTAINED AT A NODE POINT LOCATED 1.75 INCHES AWAY FROM THE AREA OF INTEREST. THUS, THEY MUST BE TRANSLATED. IT WAS ALSO FOUND THAT THE LOADS SHOWN IN FIGURE 4.2.2-1 OF THE BTI REPORT WERE NOT TRANSLATED CORRECTLY TO THE AREA OF INTEREST UNDER CONSIDERATION. THUS, THE FOLLOWING CALCULATIONS SHOW ALL NECESSARY LOAD TRANSLATIONS. THE EQUATIONS USED ARE:

$$M_y = M_y$$
$$F_y = F_y$$

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$$M_x = M_x - \ell F_z$$

$$M_z = M_z - \ell F_x$$

$\ell = 1.75$ (LOCE, SEISMIC)

$\ell = 11.937$ (D.W., ETC. FROM BTI)

TRANSLATED LOADS ARE:

LOAD	M_x (IN-LB)	M_y (IN-LB)	M_z (IN-LB)	F_y (LB)
LOCE	-391	256	1016	772
SEISMIC	-212	377	1632	467
DEAD WEIGHT	-126	-2677	1209	-217
POWER RELIEF OP.	3572	-2781	4939	-279
P.R. & SAFETY OP.	-5243	6723	-8979	99
STEADY STATE	5232	-2017	7354	-267
SPRAY OPERATING	-410	-948	-315	-12

STRESSES ARE CALCULATED AS FOLLOWS:

$$\sigma_{M_x} = M_x / Z_x$$

$$\sigma_{M_z} = M_z / Z_z$$

$$\sigma_{F_y} = F_y / A$$

$$\tau_y = M_y / Z_y$$

WHERE

$Z_x = Z_z = 3.826$ (INSIDE) IN^3.
$Z_x = Z_z = 1.305$ (OUTSIDE) IN^3
$Z_y = 7.665$ (INSIDE) IN^3
$Z_y = 2.611$ (OUTSIDE) IN^3.
$A = 3.931$ $IN.^3$

A4/

THIS RESULTS IN THE FOLLOWING STRESSES

TRANSIENT	σ_{M_x} (IN)	σ_{M_x} (OUT)	σ_{M_z} (IN)	σ_{M_z} (OUT)	σ_{F_y} (IN)	σ_{F_y} (OUT)
LOCE	± 102	± 300	± 266	± 779	196	196
SEISMIC	± 55	± 162	± 427	± 1251	119	119
DEADWEIGHT	± 33	± 97	± 316	± 926	-55	-55
P. R. OP.	± 934	± 2737	± 1291	± 3785	-71	-71
P. R. & S. OP.	± 1370	± 4018	± 2347	± 6880	25	25
STEADY STATE	± 1367	± 4009	± 1922	± 5635	-68	-68
SPRAY OP.	± 107	± 314	± 82	± 241	-3	-3

NOTE — ALL STRESSES IN PSI.

PIPING STRESS IS FOUND BY:

$$\sigma_b = \sigma_{F_y} + \sqrt{\sigma_{M_x}^2 + \sigma_{M_z}^2}$$

$$\tau_{yH} = M_y / Z_y$$

$$\sigma_T = \sigma_b/2 + \sqrt{(\sigma_b/2)^2 + \tau_y^2}$$

	σ_b (PSI)		τ_{yH} (PSI)		σ_T (PSI)	
TRANSIENT	INSIDE	OUTSIDE	INSIDE	OUTSIDE	INSIDE	OUTSIDE
LOCE	481	1031	33	98	483	1040
SEISMIC	550	1380	49	144	554	1395
DEAD WEIGHT	263	876	-349	-1025	504	1553
P.R. OP.	1522	4600	-363	-1065	1604	4835
P.R. & S. OP.	2743	7992	877	2575	2999	8750
STEADY STATE	2291	6848	-263	-772	2321	6934
SPRAY OP.	132	393	-124	-363	206	609

MAXIMUM THERMAL TRANSIENT LOADS SHOWN ON PAGES 4-526 TO 4-531 (FOR ELEMENTS 33-36, 81, AND 82) WERE LINEARIZED TO REMOVE PEAK EFFECTS. A SIMPLE LEAST SQUARES REGRESSION METHOD WAS USED AND, THUS, CALCULATIONS WILL NOT BE SHOWN.

TO COMPLETE THE PRIMARY PLUS SECONDARY STRESS CALCULATIONS AND OTHER REQUIREMENTS, THE SAAS III FINITE ELEMENT MODEL OF THE SPRAY NOZZLE WAS RUN WITH THE 450°F STEP TRANSIENT THERMAL LOADING. BOUNDARY CONDITIONS USED

CONSISTED OF AXIAL RESTRAINTS ON NODES 356-361. THE COMPLETE FINITE ELEMENT MODEL, INCLUDING THE NODE AND ELEMENT NUMBERING SCHEME, IS SHOWN IN SEVERAL SECTIONS IN FIGURE A1, PAGES A6-A9. THE AREA OF INTEREST IN THIS MODEL INCLUDES ELEMENTS 120-127, 146, 147, 166, AND 167. THE STRESS COMPONENTS THROUGH THIS SECTION ARE PLOTTED AND LINEARIZED AS SHOWN IN FIGURES A2-A5, PAGES A10-A13.

THE PRIMARY PLUS SECONDARY MAXIMUM STRESS MAY NOW BE CALCULATED USING THE FOLLOWING COMPONENTS:

INSIDE

TRANSIENT	LINEARIZED STRESS COMPONENTS (KSI) σ_x	σ_y	σ_H	τ_{xy}
DEADWEIGHT	0	.263	0	-.349
POWER RELIEF OP.	↓	1.52	↓	-.363
P.R. & SAFETY OP.		2.74		.877
STEADY STATE		2.29		-.260
SPRAY OPERATING		.130		-.120
LOCE - 195 SEC.	-3.93	-6.95	-9.51	-.11
LOCE - 55 SEC.	-3.5	-8.14	.90	-.14
STEP LOAD REJECTION	-4.42	-.12	8.07	.59
LOSS OF SITE POWER	-4.32	-.20	7.79	.57
HEAT-UP (3.38 HR - NO PRES.)	-1.22	6.84	16.51	.52
HEAT-UP (3.358 HR + OP. PRES.)	-4.82	4.05	18.28	.85
COOL DOWN (4.7 HR, NO. PRES.)	-2.41	5.74	12.97	.42
COOL DOWN (1.83 HR + OP. PRES.)	-4.92	2.22	14.88	.71
450°F STEP	13.4	6.4	43.3	-2.8

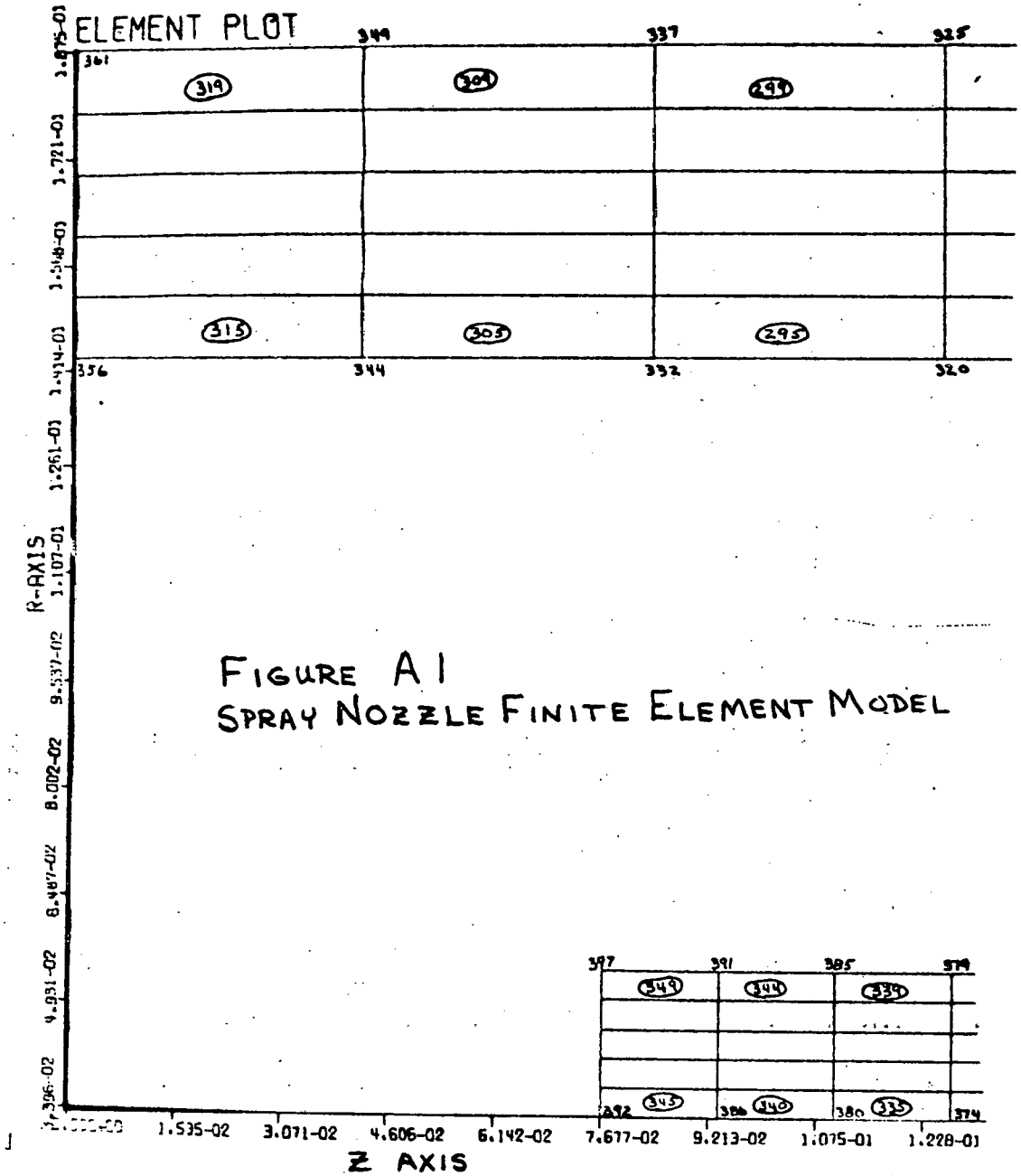


FIGURE A1
SPRAY NOZZLE FINITE ELEMENT MODEL

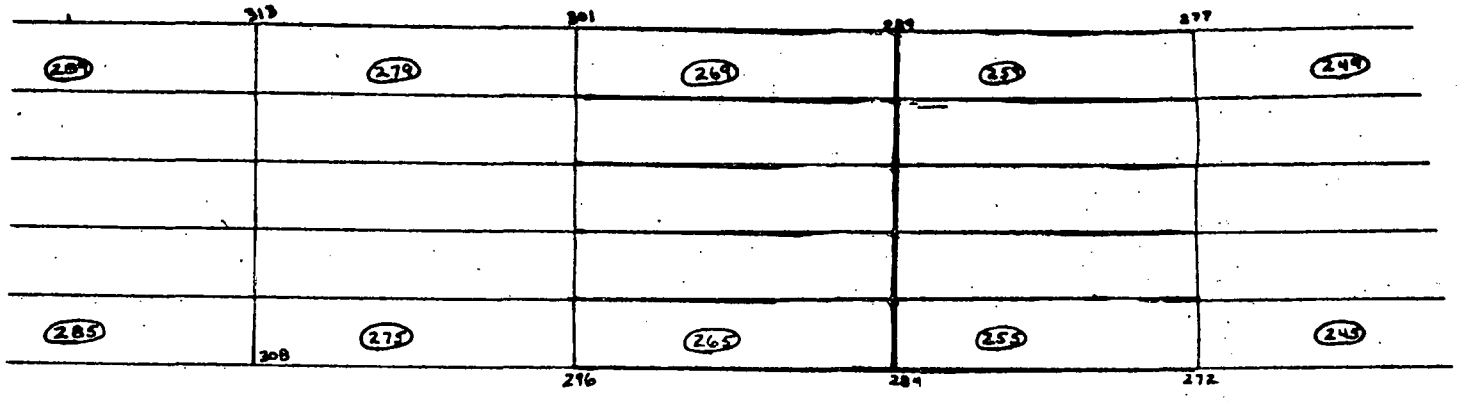
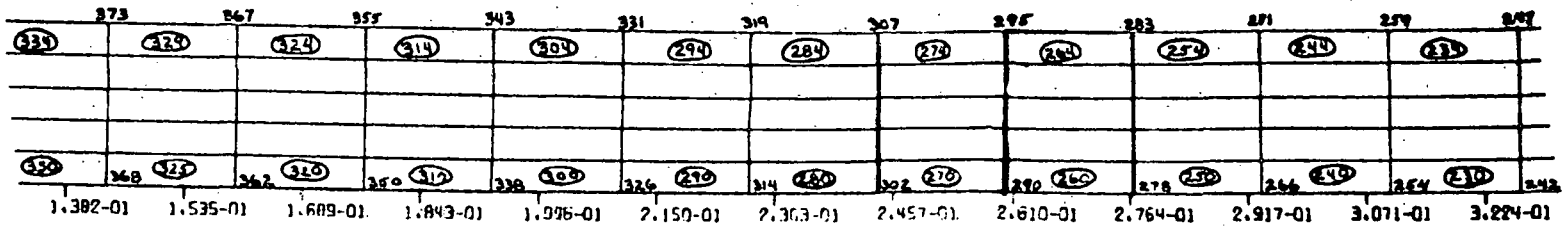


FIGURE A1 (CONT'D)



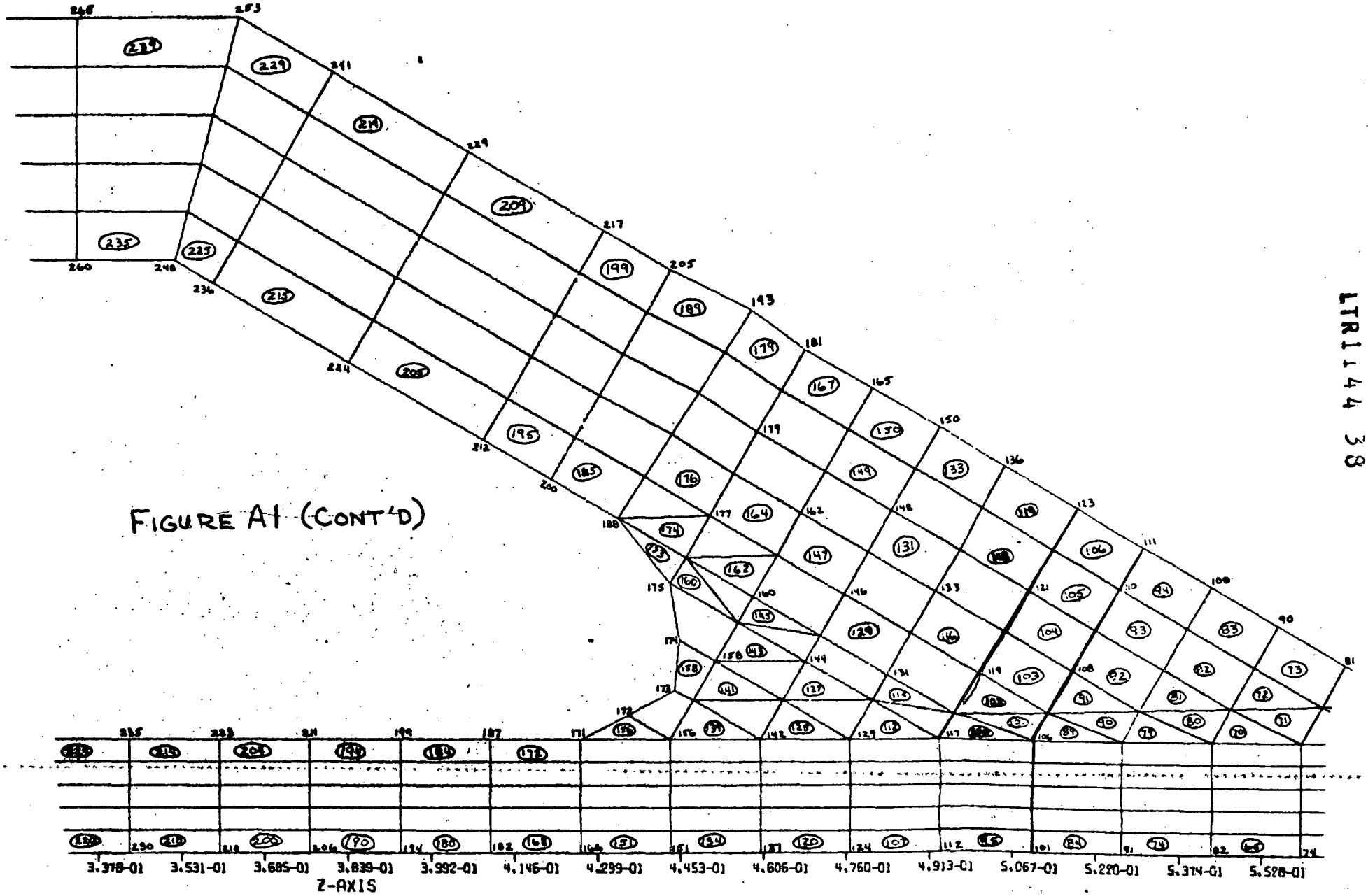


FIGURE A1 (CONT'D)

FIGURE A1 (CONT'D)

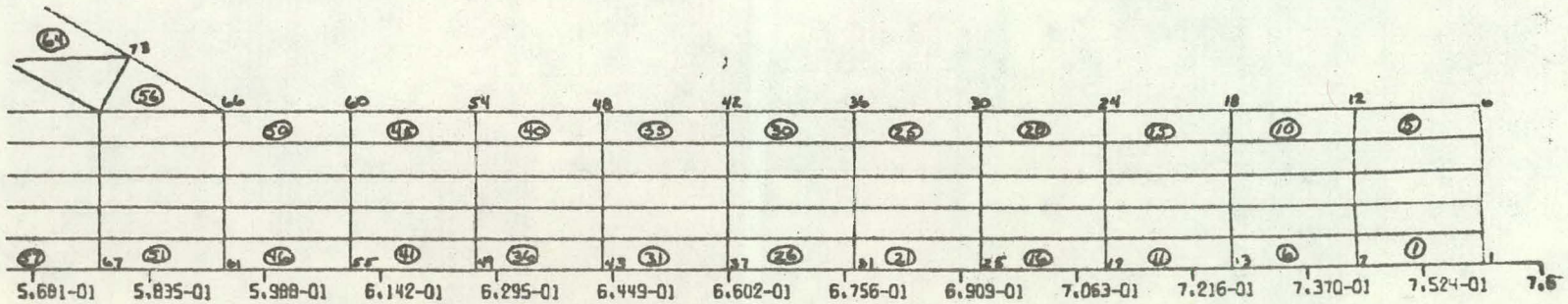


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FIGURE A2
LINEARIZED RADIAL STRESS
LOFT PRESSURIZER SPRAY NOZZLE
450°F STEP TRANSIENT
ELEMENTS 120-127, 146, 157, 166, 167

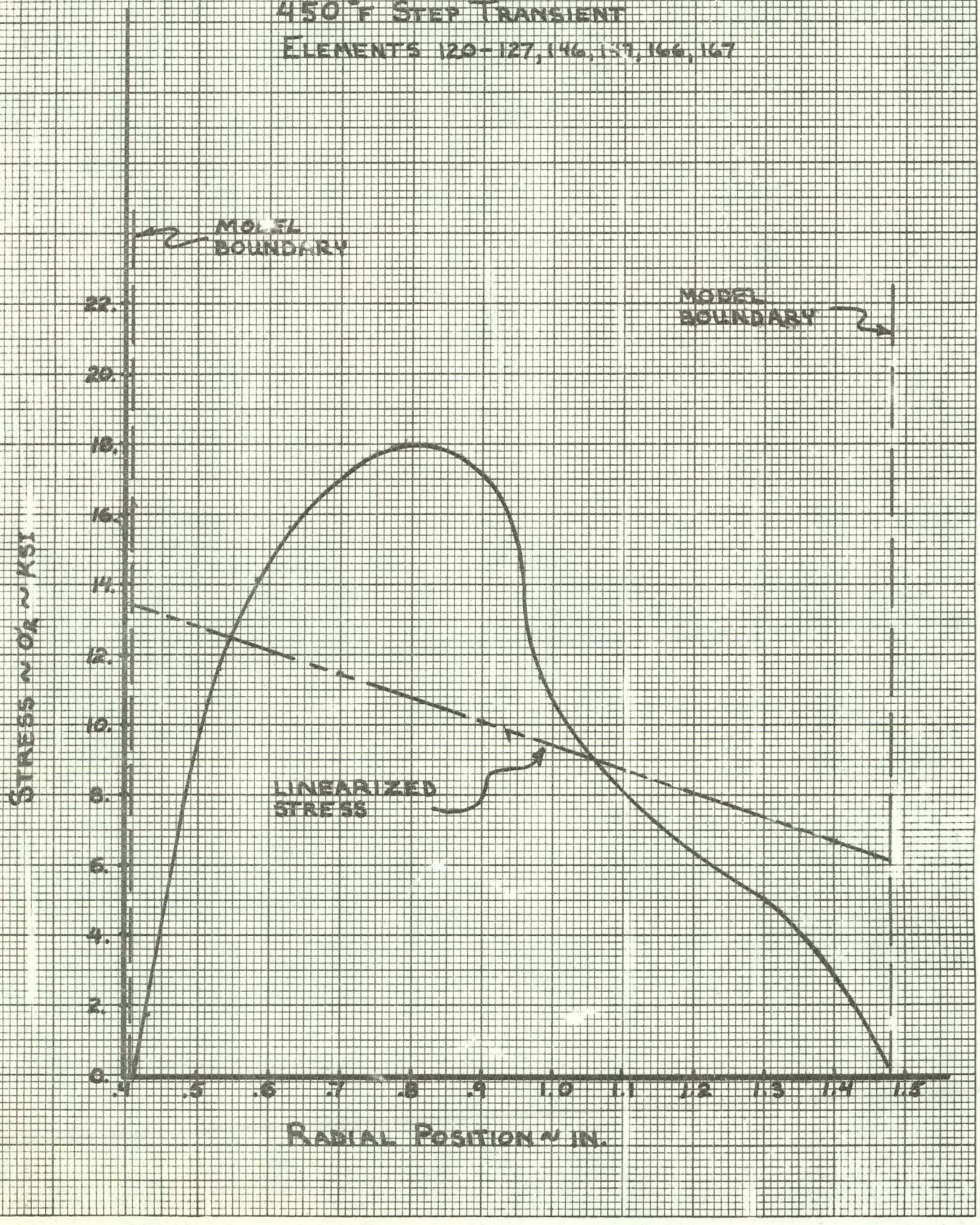

FIGURE A3
LINEARIZED AXIAL STRESS
LOFT PRESSURIZER SPRAY NOZZLE
450°F STEP TRANSIENT
ELEMENTS 120-127, 146, 147, 166, 167

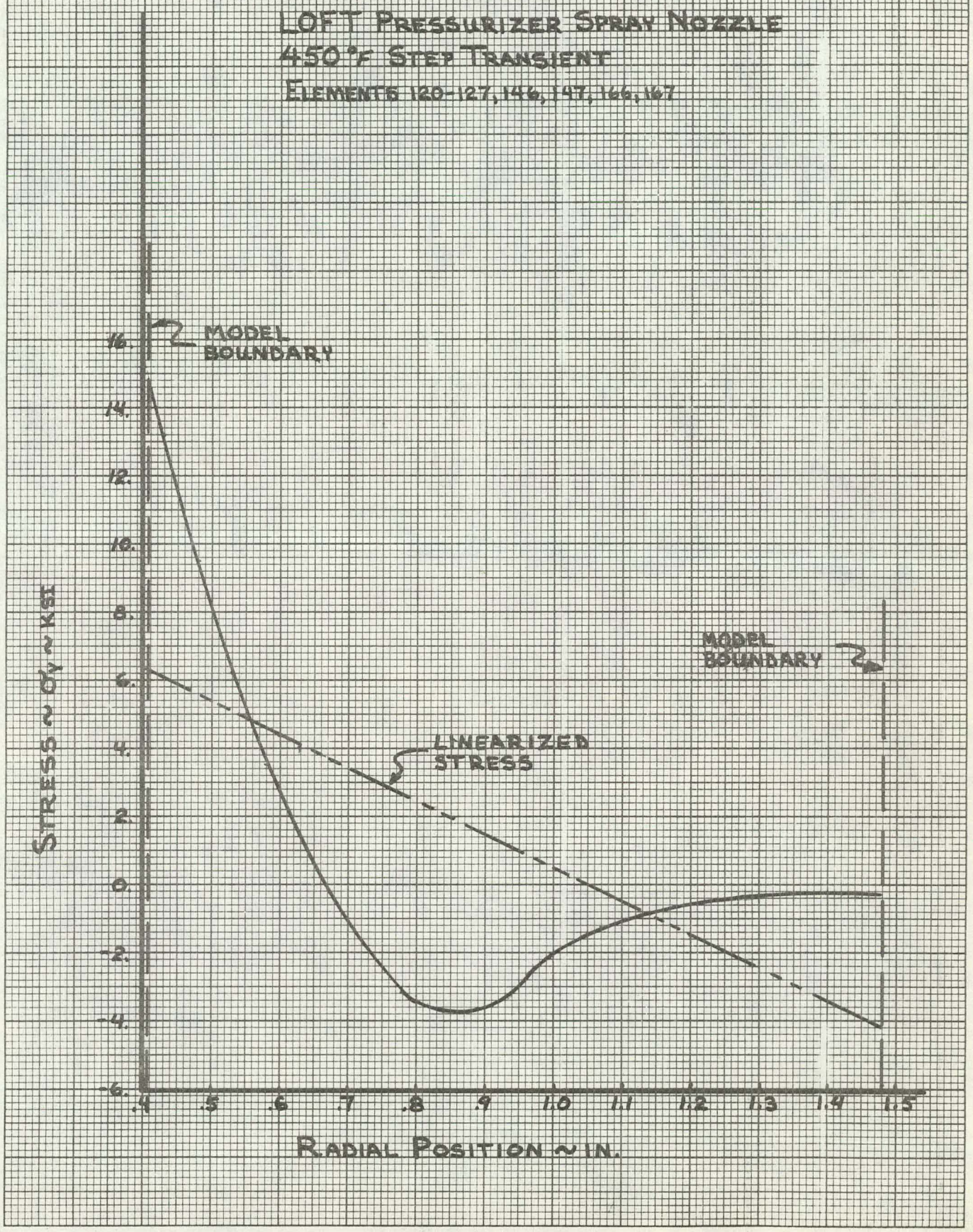

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FIGURE A4
LINEARIZED TANGENTIAL STRESS
LOFT PRESSURIZER SPRAY NOZZLE
450°F STEP TRANSIENT
ELEMENTS 120-127, 146, 147, 166, 167

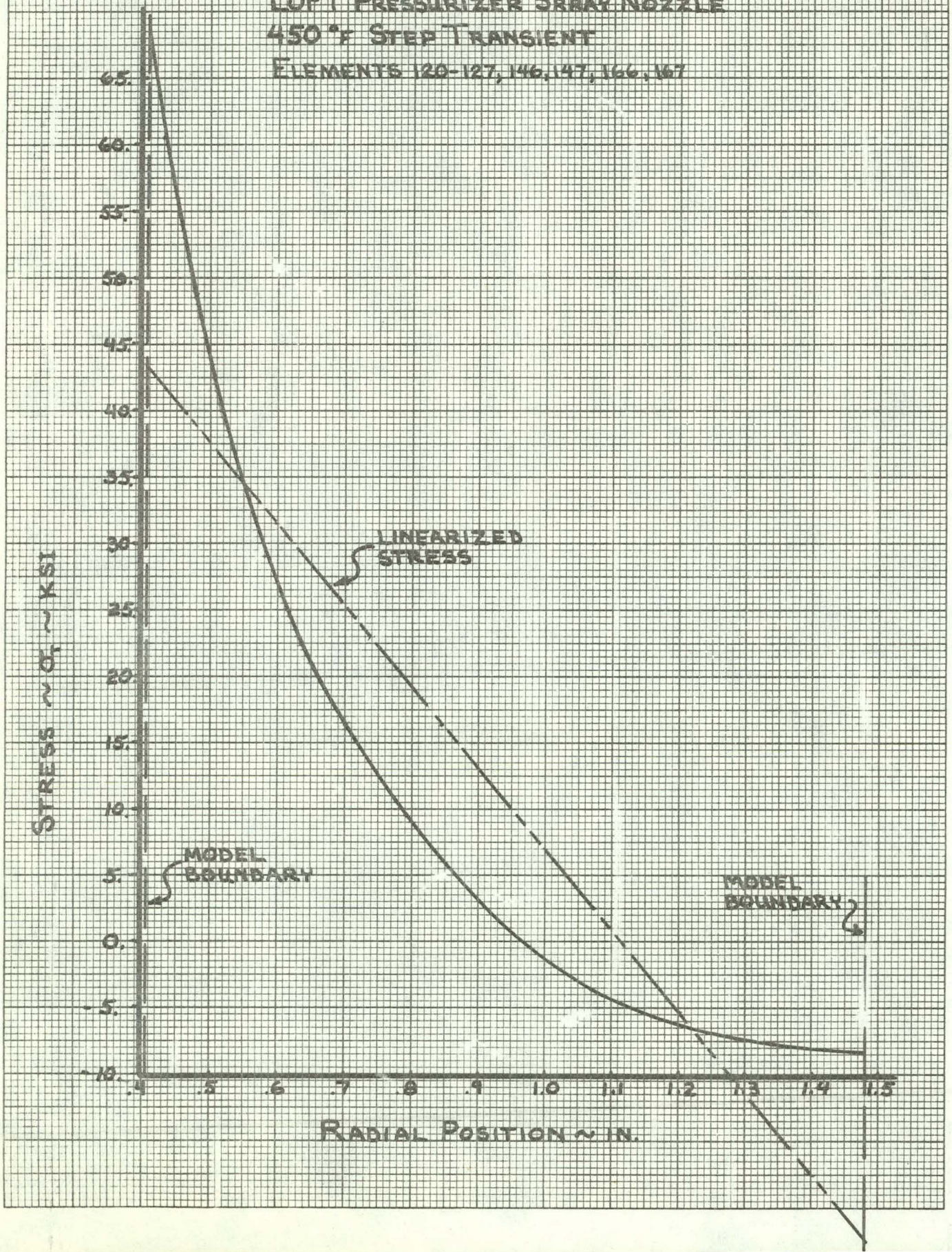

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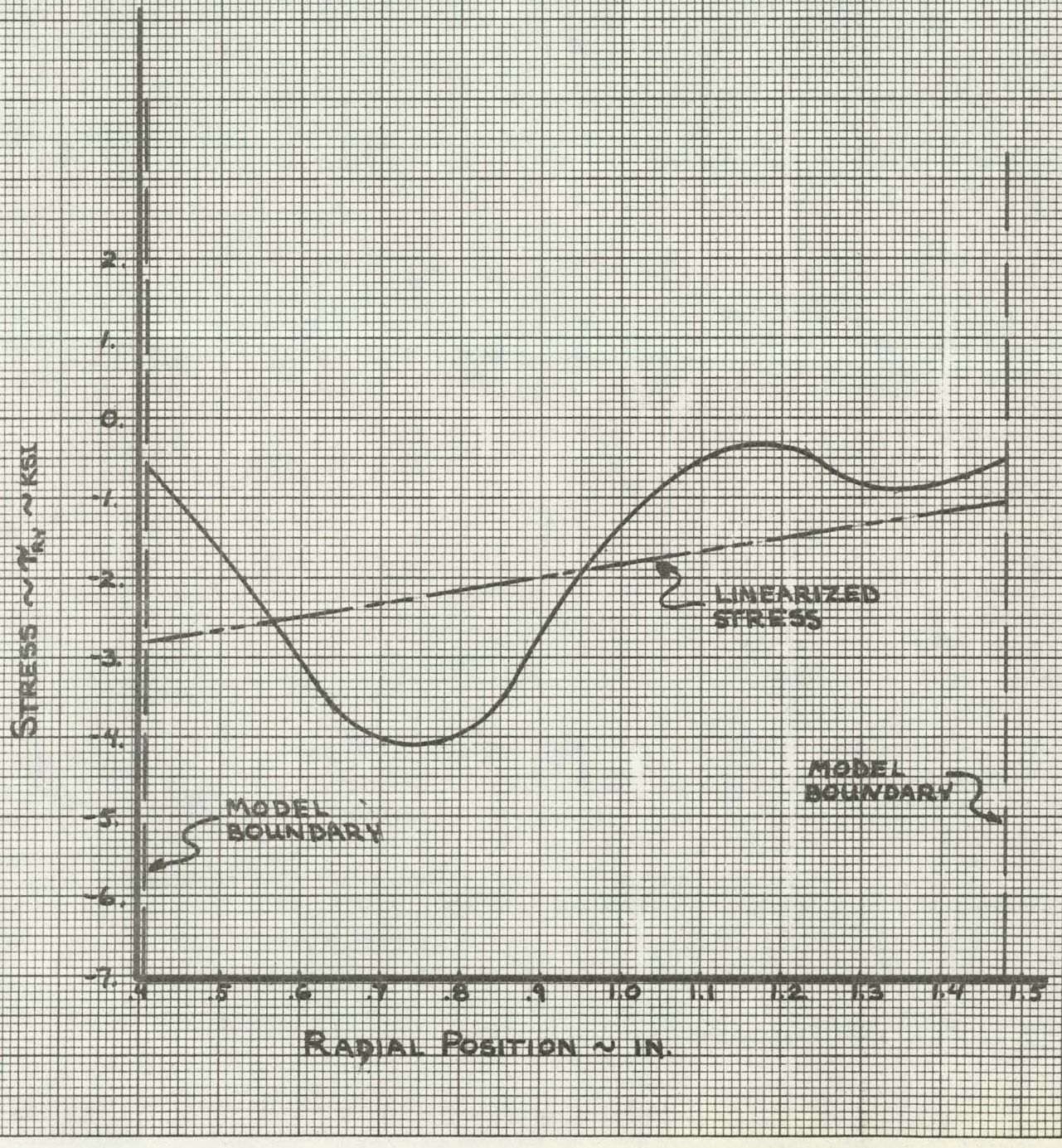
FIGURE A.5
LINEARIZED SHEAR STRESS
LOFT PRESSURIZER SPRAY NOZZLE
450°F STEP TRANSIENT
ELEMENTS 120-127, 146, 147, 166, 167



OUTSIDE

TRANSIENT	LINEARIZED STRESS COMPONENTS (KSI)			
	σ_x	σ_y	σ_H	τ_{xy}
DEADWEIGHT	0	.876	0	1.02
POWER RELIEF OP.	↓	4.60	↓	1.06
P.R. & SAFETY OP.		7.99		2.58
STEADY STATE		6.85		.77
SPRAY OP.		.39		.36
LOCE - 195 SEC	2.16	4.48	5.34	-1.01
LOCE - 55 SEC.	2.45	4.38	3.89	-.73
STEP LOAD REJECTION	8.49	-1.86	2.54	-.05
LOSS OF SITE POWER	8.22	-1.81	2.48	-.02
HEAT-UP (3.33 HR, NO PRES.)	10.37	-4.12	-1.05	.34
HEAT-UP (3.358 HR + OP. PRES.)	14.09	-4.64	1.63	.37
COOLDOWN (4.7 HR., NO PRES.)	12.31	-3.84	2.44	.30
COOLDOWN (1.83 HR + OP. PRES.)	12.62	-3.57	2.36	.33
450°F STEP	6.1	-4.2	-22.5	-1.05

FOR THIS SITUATION, THE TRIAXIAL PRINCIPAL STRESS EQUATION CAN BE WRITTEN AS:

$$\sigma^3 - (\sigma_x + \sigma_y + \sigma_H)\,\sigma^2 + (\sigma_x\sigma_y + \sigma_y\sigma_H + \sigma_x\sigma_H - \tau_{yH}^2)\,\sigma$$

$$- (\sigma_x\sigma_y\sigma_H - \sigma_H\tau_{yH}^2) = 0$$

THE SOLUTION OF THIS EQUATION YIELDS THE PRINCIPAL STRESSES. USING THE COMPONENTS OF STRESS LISTED IN THE TWO PREVIOUS TABLES, MAXIMUM PRIMARY PLUS SECONDARY STRESS INTENSITY AT THE INSIDE AND OUTSIDE SURFACES WAS CALCULATED. MAXIMUM PRIMARY PLUS SECONDARY STRESS INTENSITY RANGE AT THE INSIDE SURFACE OCCURS WHEN THE 450°F STEP TRANSIENT AND THE POWER RELIEF AND SAFETY OPERATING TRANSIENT ARE PAIRED. THE MAXIMUM PRIMARY PLUS SECONDARY STRESS INTENSITY RANGE AT THE OUTSIDE SURFACE OCCURS WHEN THE 450°F STEP TRANSIENT AND THE LOCE (195 SEC.) TRANSIENT ARE PAIRED. THE PRINCIPAL STRESSES FOR THESE CASES ARE AS FOLLOWS:

INSIDE

$\sigma_1 = 3.32$ KSI
$\sigma_2 = -15.1$ KSI
$\sigma_3 = -43.3$ KSI

OUTSIDE

$\sigma_1 = 27.8$ KSI
$\sigma_2 = 8.68$ KSI
$\sigma_3 = -3.94$ KSI

THUS, A MAXIMUM PRIMARY PLUS SECONDARY STRESS INTENSITY OF $|-43.3 + 2.4| = 40.9$ KSI OCCURS AT THE INSIDE SURFACE. FOR SA182, F316L, STAINLESS STEEL AT 650° ($T_{OP} = 653°F$), THE S_M VALUE IS 13.2 KSI. THE PRIMARY PLUS SECONDARY LIMIT IS $3S_M$; THUS:

$$3S_M = 3(13.2) = 39.6 \text{ KSI}$$

$$40.9 > 39.6$$

$\therefore$ EXCEED STRESS LIMIT

SINCE THE $3S_M$ LIMIT IS EXCEEDED, A SIMPLIFIED ELASTIC-PLASTIC ANALYSIS WILL BE PERFORMED IN ACCORDANCE WITH SUBPARAGRAPH NB-3228.3. TO CHECK PRIMARY PLUS SECONDARY MINUS THERMAL BENDING STRESS INTENSITY, FIGURES A2-A5 ARE USED. THE LINEARIZED STRESS COMPONENTS MINUS THERMAL BENDING ARE:

		σ_x	σ_y	σ_H	τ_{yH}
①	450° STEP	9.80	1.05	10.40	-1.93
②	P.R.&SAFETY OP.	0	2.74	0.0	.88
① - ②		9.80	-1.69	10.40	-2.81

SUBSTITUTING THE STRESS COMPONENT RANGES ABOVE INTO THE PREVIOUSLY SHOWN TRIAXIAL STRESS EQUATION YIELDS THE FOLLOWING PRINCIPAL STRESSES UPON SOLUTION:

$\sigma_1 = -2.35$
$\sigma_2 = 9.53$
$\sigma_3 = 11.3$

THIS YIELDS A STRESS INTENSITY OF 13.65 KSI. THIS VALUE OF STRESS INTENSITY IS LESS THAN THE 39.6 KSI $3S_M$ LIMIT; THUS, THE REMAINDER OF THE SIMPLIFIED ELASTIC-PLASTIC ANALYSIS IS COMPLETED AS FOLLOWS:

$m = 1.7$
$n = .3$

$S_n = 40.9$ KSI

$3mS_M = 3(1.7)(13.2) = 63.32$ KSI

$$\Rightarrow K_e = 1.0 + \frac{1-n}{n(m-1)}\left(\frac{S_n}{3S_m} - 1\right)$$

$$= 1.0 + \frac{.7}{.3(.7)}\left(\frac{40.9}{39.6} - 1\right)$$

$$= 1.0 + 3.33\,(1.03 - 1)$$

$$= 1.0 + .10$$

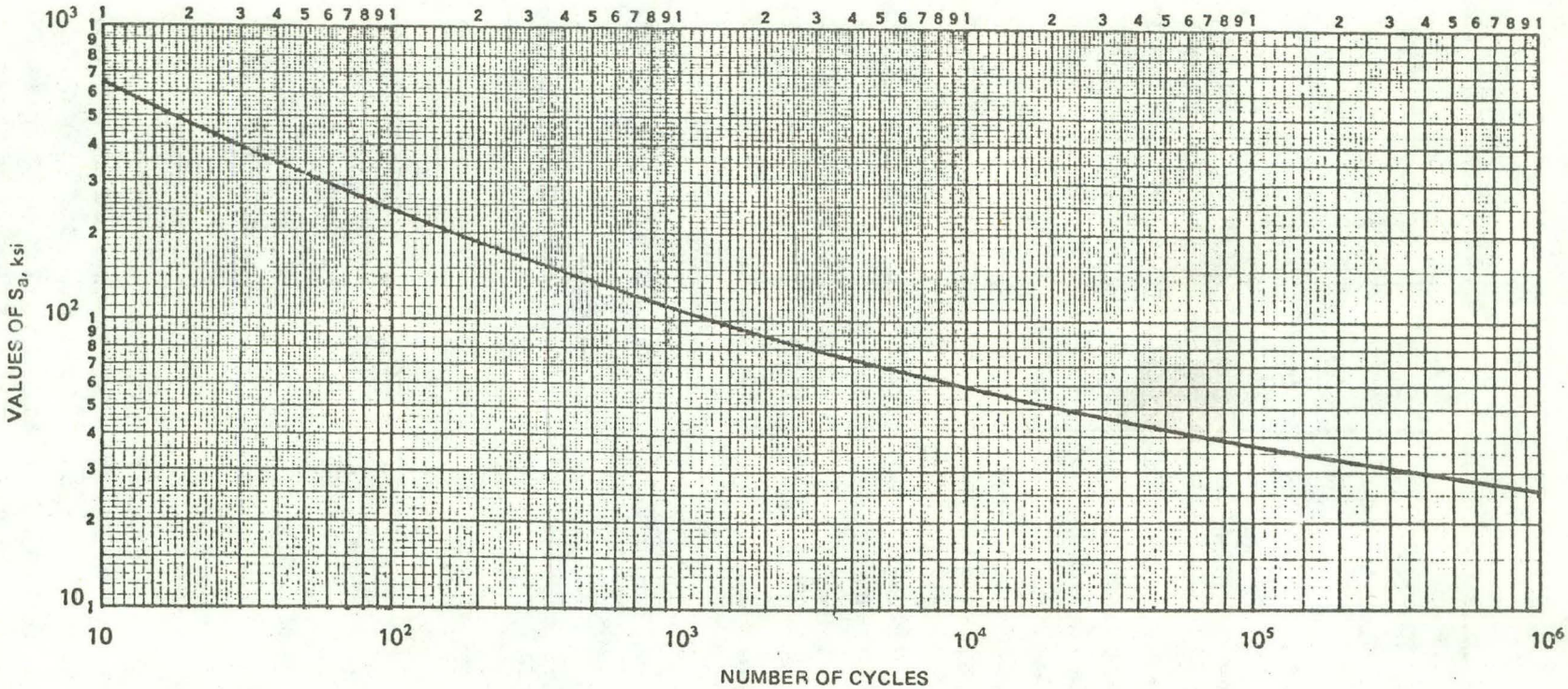
$$\underline{K_e = 1.10}$$

THUS, THE ALTERNATING STRESS INTENSITY FOR THIS PAIR MUST BE MULTIPLIED BY 1.10 WHEN USED IN THE FATIGUE CALCULATIONS. THIS SATISFIES ALL PRIMARY PLUS SECONDARY STRESS REQUIREMENTS.

THE FATIGUE ANALYSIS WAS PERFORMED IN ACCORDANCE WITH SUB PARAGRAPH NB-3222.4. THE PEAK STRESSES USED IN THESE CALCULATIONS WERE AS LISTED IN THE FATIGUE ANALYSIS SHOWN IN THE BTI REPORT WITH THE EXCEPTION OF THE 450°F STEP TRANSIENT. THE PEAK STRESS VALUES FOR THE 450°F STEP TRANSIENT WERE TAKEN FROM FIGURES A2-A5, PAGES A10-A13. THE TRANSIENTS ANALYZED AND THE PEAK STRESSES USED ARE SHOWN IN THE FOLLOWING TABLE.

TRANSIENT	NO. CYCLES	σ_R (KSI)	σ_z (KSI)	σ_H (KSI)	τ_{rz} (KSI)
1. POWER RELIEF OP.	370	0	4.835	0	0
2. P. R. & SAFETY OP.	370	↓	8.750	↓	↓
3. STEADY STATE FLUCTUATION	1500	↓	6.934	↓	↓
4. SPRAY OP.	10^6	↓	0.609	↓	↓
5. SEISMIC (OBE)	100	↓	1.395	↓	↓
6. LOCE (MECHANICAL)	2600	↓	1.040	↓	↓
7. 450°F STEP THERMAL	500	18.0	14.80	69.50	-4.10
8. LOCE (55 SEC.)	260	-2.886	-6.582	1.39	.447
9. LOCE (195 SEC.)	260	-1.191	-6.143	-8.33	.549
10. STEP LOAD REJECTION	360	-2.724	.507	10.295	.450
11. LOSS OF SITE POWER	360	-2.677	.379	9.909	.435
12. HEAT-UP (3.36 HR)	1500	-.891	6.604	19.213	.669
13. HEAT-UP (+PRESSURE)(3.33HR)	1500	-3.036	4.849	22.132	.891
14. HEAT-UP (+PRESSURE)(3.36 HR)	1500	-3.063	4.849	21.861	.875
15. COOLDOWN (+PRESSURE)	1500	-3.064	2.721	17.958	.711
16. COOLDOWN (.83 HR)	1500	-.620	4.965	14.980	.479
17. COOLDOWN (.67 HR)	1500	-.622	5.759	16.361	.540
18. COOLDOWN (.70 HR)	1500	-.598	5.860	16.397	.547
19. LEAK	260	-2.987	-2.742	3.640	.284
20. O.T.P.	10^6	-2.445	-2.244	2.978	.231

THE APPLIED MECHANICS BRANCH COMPUTER PROGRAM INTENS WAS USED TO CALCULATE ALTERNATING STRESS INTENSITIES FOR ALL POSSIBLE PAIRINGS OF THE TRANSIENTS LISTED ABOVE. THE FINAL TABLE OF OUTPUT FROM THIS PROGRAM LISTS ALTERATING STRESS INTENSITIES IN DECREASING ORDER SUCH THAT THE APPROPRIATE FATIGUE LIFE CURVE MAY BE USED TO CALCULATE ALLOWABLE NUMBERS OF CYCLES AND THE CUMULATIVE USAGE FACTOR. FIGURE I-9.2 AS SHOWN ON PAGE 159 OF SUBSECTION NA OF THE 1974 EDITION OF THE ASME CODE WAS USED TO DETERMINE ALLOWABLE NUMBERS OF CYCLES. THIS CURVE IS REPRODUCED IN FIGURE A6, PAGE A18. COMPUTER PROGRAM INTENS OUTPUT IS SHOWN ON PAGES A19 - A41. THE CUMULATIVE USAGE FACTOR CALCULATION IS SHOWN ON PAGE A37. IT WILL BE NOTED THAT THE CUMULATIVE USAGE FACTOR IS 0.0027. THIS WILL MEET ALL FATIGUE LIFE REQUIREMENTS.



NOTE:
E = 26.0 X 10^6 psi

FIGURE A6

DESIGN FATIGUE CURVE FOR AUSTENITIC STEELS, NICKEL-CHROMIUM-IRON ALLOY, NICKEL-IRON-CHROMIUM ALLOY AND NICKEL-COPPER ALLOY

* * PROGRAM - - INTENS - - CALCULATION OF TRANSIENT STRESS INTENSITIES * *

NO. OF PROBLEMS OR POINTS TO BE ANALYZED IS 1

PROBLEM NO. 1
NO. OF TRANSIENTS 20
STRESS CONCENTRATION FACTOR = 1.000
ELASTIC MODULUS RATIO = 0.965

* * TRANSIENT STRESS DATA * *

* * NOTE THAT STRESSES ARE IN KSI * *

TRANS	NO. CYCLES	SIGMA X	SIGMA Y	SIGMA Z	TAU XY	TAU XZ	TAU YZ
1	370	0.0	4.835	0.0	0.0	0.0	0.0
2	370	0.0	8.750	0.0	0.0	0.0	0.0
3	1500	0.0	6.934	0.0	0.0	0.0	0.0
4	1000000	0.0	0.609	0.0	0.0	0.0	0.0
5	100	0.0	1.395	0.0	0.0	0.0	0.0
6	2600	0.0	1.040	0.0	0.0	0.0	0.0
7	500	18.000	14.800	69.500	-4.100	0.0	0.0
8	260	-2.886	-6.582	1.390	-0.447	0.0	0.0
9	260	-1.191	-6.143	-8.330	-0.549	0.0	0.0
10	360	-2.724	0.507	10.295	0.450	0.0	0.0
11	360	-2.667	0.379	9.909	0.435	0.0	0.0
12	1500	-0.891	6.604	19.213	0.669	0.0	0.0
13	1500	-3.036	4.849	22.132	0.891	0.0	0.0
14	1500	-3.063	4.849	21.861	0.875	0.0	0.0
15	1500	-3.064	2.721	17.958	0.711	0.0	0.0
16	1500	-0.620	4.965	14.980	0.479	0.0	0.0
17	1500	-0.622	5.759	16.361	0.540	0.0	0.0
18	1500	-0.598	5.860	16.397	0.547	0.0	0.0
19	260	-2.987	-2.742	3.640	0.284	0.0	0.0
20	1000000	-2.445	-2.244	2.978	0.231	0.0	0.0

* * STRESS COMPONENT RANGES - NOTE THAT A TRANSIENT NUMBER OF ZERO IMPLIES NULL CONDITIONS * *

* * THESE VALUES FOUND BY SUBTRACTING COMPONENTS OF THE TRANSIENT PAIRS

* * NOTE THAT IF AXISYMMETRIC STRESS DATA IS USED-SUCH AS SAAS3 OUTPUT-STRESS COLUMNS X,Y,Z, AND XY CORRESPOND TO R,Z,T, AND RZ STRESSES, RESPECTIVELY

TRAN.	PAIR	SIG X	SIG Y	SIG Z	TAU XY	TAU XZ	TAU YZ
1	0	0.0	4.835	0.0	0.0	0.0	0.0
2	0	0.0	8.750	0.0	0.0	0.0	0.0
3	0	0.0	6.934	0.0	0.0	0.0	0.0
4	0	0.0	0.609	0.0	0.0	0.0	0.0
5	0	0.0	1.395	0.0	0.0	0.0	0.0
6	0	0.0	1.040	0.0	0.0	0.0	0.0
7	0	18.000	14.800	69.500	-4.100	0.0	0.0
8	0	-2.886	-6.582	1.390	-0.447	0.0	0.0
9	0	-1.191	-6.143	-8.330	-0.549	0.0	0.0
10	0	-2.724	0.507	10.295	0.450	0.0	0.0
11	0	-2.667	0.379	9.909	0.435	0.0	0.0
12	0	-0.891	6.604	19.213	0.669	0.0	0.0
13	0	-3.036	4.849	22.132	0.891	0.0	0.0
14	0	-3.063	4.849	21.861	0.875	0.0	0.0
15	0	-3.064	2.721	17.958	0.711	0.0	0.0
16	0	-0.620	4.965	14.980	0.479	0.0	0.0
17	0	-0.622	5.759	16.361	0.540	0.0	0.0
18	0	-0.598	5.860	16.397	0.547	0.0	0.0
19	0	-2.987	-2.742	3.640	0.284	0.0	0.0
20	0	-2.445	-2.244	2.978	0.231	0.0	0.0
1	2	0.0	-3.915	0.0	0.0	0.0	0.0
1	3	0.0	-2.099	0.0	0.0	0.0	0.0
1	4	0.0	4.226	0.0	0.0	0.0	0.0
1	5	0.0	3.440	0.0	0.0	0.0	0.0
1	6	0.0	3.795	0.0	0.0	0.0	0.0
1	7	-18.000	-9.965	-69.500	4.100	0.0	0.0
1	8	2.886	11.417	-1.390	0.447	0.0	0.0
1	9	1.191	10.978	8.330	0.549	0.0	0.0
1	10	2.724	4.328	-10.295	-0.450	0.0	0.0
1	11	2.667	4.456	-9.909	-0.435	0.0	0.0
1	12	0.891	-1.769	-19.213	-0.669	0.0	0.0
1	13	3.036	-0.014	-22.132	-0.891	0.0	0.0
1	14	3.063	-0.014	-21.861	-0.875	0.0	0.0
1	15	3.064	2.114	-17.958	-0.711	0.0	0.0
1	16	0.620	-0.130	-14.980	-0.479	0.0	0.0
1	17	0.622	-0.924	-16.361	-0.540	0.0	0.0
1	18	0.598	-1.025	-16.397	-0.547	0.0	0.0
1	19	2.987	7.577	-3.640	-0.284	0.0	0.0
1	20	2.445	7.079	-2.978	-0.231	0.0	0.0
2	3	0.0	1.816	0.0	0.0	0.0	0.0
2	4	0.0	8.141	0.0	0.0	0.0	0.0
2	5	0.0	7.355	0.0	0.0	0.0	0.0
2	6	0.0	7.710	0.0	0.0	0.0	0.0
2	7	-18.000	-6.050	-69.500	4.100	0.0	0.0
2	8	2.886	15.332	-1.390	0.447	0.0	0.0
2	9	1.191	14.893	8.330	0.549	0.0	0.0

* * STRESS COMPONENT RANGES - NOTE THAT A TRANSIENT NUMBER OF ZERO IMPLIES NULL CONDITIONS * *

* * THESE VALUES FOUND BY SUBTRACTING COMPONENTS OF THE TRANSIENT PAIRS

* * NOTE THAT IF AXISYMMETRIC STRESS DATA IS USED-SUCH AS SAAS3 OUTPUT-STRESS COLUMNS X,Y,Z, AND XY CORRESPOND TO R,Z,T, AND RZ STRESSES, RESPECTIVELY

TRAN.	PAIR	SIG X	SIG Y	SIG Z	TAU XY	TAU XZ	TAU YZ
2	10	2.724	8.243	-10.295	-0.450	0.0	0.0
2	11	2.667	8.371	-9.909	-0.435	0.0	0.0
2	12	0.891	2.146	-19.213	-0.669	0.0	0.0
2	13	3.036	3.901	-22.132	-0.891	0.0	0.0
2	14	3.063	3.901	-21.861	-0.875	0.0	0.0
2	15	3.064	6.029	-17.958	-0.711	0.0	0.0
2	16	0.620	3.785	-14.980	-0.479	0.0	0.0
2	17	0.622	2.991	-16.361	-0.540	0.0	0.0
2	18	0.598	2.890	-16.397	-0.547	0.0	0.0
2	19	2.987	11.492	-3.640	-0.284	0.0	0.0
2	20	2.445	10.994	-2.978	-0.231	0.0	0.0
3	4	0.0	6.325	0.0	0.0	0.0	0.0
3	5	0.0	5.539	0.0	0.0	0.0	0.0
3	6	0.0	5.894	0.0	0.0	0.0	0.0
3	7	-18.000	-7.866	-69.500	4.100	0.0	0.0
3	8	2.886	13.516	-1.390	0.447	0.0	0.0
3	9	1.191	13.077	8.330	0.549	0.0	0.0
3	10	2.724	6.427	-10.295	-0.450	0.0	0.0
3	11	2.667	6.555	-9.909	-0.435	0.0	0.0
3	12	0.891	0.330	-19.213	-0.669	0.0	0.0
3	13	3.036	2.085	-22.132	-0.891	0.0	0.0
3	14	3.063	2.085	-21.861	-0.875	0.0	0.0
3	15	3.064	4.213	-17.958	-0.711	0.0	0.0
3	16	0.620	1.969	-14.980	-0.479	0.0	0.0
3	17	0.622	1.175	-16.361	-0.540	0.0	0.0
3	18	0.598	1.074	-16.397	-0.547	0.0	0.0
3	19	2.987	9.676	-3.640	-0.284	0.0	0.0
3	20	2.445	9.178	-2.978	-0.231	0.0	0.0
4	5	0.0	-0.786	0.0	0.0	0.0	0.0
4	6	0.0	-0.431	0.0	0.0	0.0	0.0
4	7	-18.000	-14.191	-69.500	4.100	0.0	0.0
4	8	2.886	7.191	-1.390	0.447	0.0	0.0
4	9	1.191	6.752	8.330	0.549	0.0	0.0
4	10	2.724	0.102	-10.295	-0.450	0.0	0.0
4	11	2.667	0.230	-9.909	-0.435	0.0	0.0
4	12	0.891	-5.995	-19.213	-0.669	0.0	0.0
4	13	3.036	-4.240	-22.132	-0.891	0.0	0.0
4	14	3.063	-4.240	-21.861	-0.875	0.0	0.0
4	15	3.064	-2.112	-17.958	-0.711	0.0	0.0
4	16	0.620	-4.356	-14.980	-0.479	0.0	0.0
4	17	0.622	-5.150	-16.361	-0.540	0.0	0.0
4	18	0.598	-5.251	-16.397	-0.547	0.0	0.0
4	19	2.987	3.351	-3.640	-0.284	0.0	0.0
4	20	2.445	2.853	-2.978	-0.231	0.0	0.0
5	6	0.0	0.355	0.0	0.0	0.0	0.0
5	7	-18.000	-13.405	-69.500	4.100	0.0	0.0

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* * STRESS COMPONENT RANGES - NOTE THAT A TRANSIENT NUMBER OF ZERO IMPLIES NULL CONDITIONS * *

* * THESE VALUES FOUND BY SUBTRACTING COMPONENTS OF THE TRANSIENT PAIRS

* * NOTE THAT IF AXISYMMETRIC STRESS DATA IS USED-SUCH AS SAAS3 OUTPUT-STRESS COLUMNS X,Y,Z, AND XY CORRESPOND TO R,Z,T, AND RZ STRESSES, RESPECTIVELY

TRAN.	PAIR	SIG X	SIG Y	SIG Z	TAU XY	TAU XZ	TAU YZ
5	8	2.886	7.977	-1.390	0.447	0.0	0.0
5	9	1.191	7.538	8.330	0.549	0.0	0.0
5	10	2.724	0.888	-10.295	-0.450	0.0	0.0
5	11	2.667	1.016	-9.909	-0.435	0.0	0.0
5	12	0.891	-5.209	-19.213	-0.669	0.0	0.0
5	13	3.036	-3.454	-22.132	-0.891	0.0	0.0
5	14	3.063	-3.454	-21.861	-0.875	0.0	0.0
5	15	3.064	-1.326	-17.958	-0.711	0.0	0.0
5	16	0.620	-3.570	-14.980	-0.479	0.0	0.0
5	17	0.622	-4.364	-16.361	-0.540	0.0	0.0
5	18	0.598	-4.465	-16.397	-0.547	0.0	0.0
5	19	2.987	4.137	-3.640	-0.284	0.0	0.0
5	20	2.445	3.639	-2.978	-0.231	0.0	0.0
6	7	-18.000	-13.760	-69.500	4.100	0.0	0.0
6	8	2.886	7.622	-1.390	0.447	0.0	0.0
6	9	1.191	7.183	8.330	0.549	0.0	0.0
6	10	2.724	0.533	-10.295	-0.450	0.0	0.0
6	11	2.667	0.661	-9.909	-0.435	0.0	0.0
6	12	0.891	-5.564	-19.213	-0.669	0.0	0.0
6	13	3.036	-3.809	-22.132	-0.891	0.0	0.0
6	14	3.063	-3.809	-21.861	-0.875	0.0	0.0
6	15	3.064	-1.681	-17.958	-0.711	0.0	0.0
6	16	0.620	-3.925	-14.980	-0.479	0.0	0.0
6	17	0.622	-4.719	-16.361	-0.540	0.0	0.0
6	18	0.598	-4.820	-16.397	-0.547	0.0	0.0
6	19	2.987	3.782	-3.640	-0.284	0.0	0.0
6	20	2.445	3.284	-2.978	-0.231	0.0	0.0
7	8	20.886	21.382	68.110	-3.653	0.0	0.0
7	9	19.191	20.943	77.830	-3.551	0.0	0.0
7	10	20.724	14.293	59.205	-4.550	0.0	0.0
7	11	20.667	14.421	59.591	-4.535	0.0	0.0
7	12	18.891	8.196	50.287	-4.769	0.0	0.0
7	13	21.036	9.951	47.368	-4.991	0.0	0.0
7	14	21.063	9.951	47.639	-4.975	0.0	0.0
7	15	21.064	12.079	51.542	-4.811	0.0	0.0
7	16	18.620	9.835	54.520	-4.579	0.0	0.0
7	17	18.622	9.041	53.139	-4.640	0.0	0.0
7	18	18.598	8.940	53.103	-4.647	0.0	0.0
7	19	20.987	17.542	65.860	-4.384	0.0	0.0
7	20	20.445	17.044	66.522	-4.331	0.0	0.0
8	9	-1.695	-0.439	9.720	0.102	0.0	0.0
8	10	-0.162	-7.089	-8.905	-0.897	0.0	0.0
8	11	-0.219	-6.961	-8.519	-0.882	0.0	0.0
8	12	-1.995	-13.186	-17.823	-1.116	0.0	0.0
8	13	0.150	-11.431	-20.742	-1.338	0.0	0.0
8	14	0.177	-11.431	-20.471	-1.322	0.0	0.0

* * STRESS COMPONENT RANGES - NOTE THAT A TRANSIENT NUMBER OF ZERO IMPLIES NULL CONDITIONS * *

* * THESE VALUES FOUND BY SUBTRACTING COMPONENTS OF THE TRANSIENT PAIRS

* * NOTE THAT IF AXISYMMETRIC STRESS DATA IS USED-SUCH AS SAAS3 OUTPUT-STRESS COLUMNS X,Y,Z, AND XY CORRESPOND TO R,Z,T, AND RZ STRESSES, RESPECTIVELY

TRAN.	PAIR	SIG X	SIG Y	SIG Z	TAU XY	TAU XZ	TAU YZ
8	15	0.178	-9.303	-16.568	-1.158	0.0	0.0
8	16	-2.266	-11.547	-13.590	-0.926	0.0	0.0
8	17	-2.264	-12.341	-14.97[illegible]	-0.987	0.0	0.0
8	18	-2.268	-12.442	-15.007	-0.994	0.0	0.0
8	19	0.101	-3.840	-2.250	-0.731	0.0	0.0
8	20	-0.441	-4.338	-1.588	-0.678	0.0	0.0
9	10	1.533	-6.650	-18.625	-0.999	0.0	0.0
9	11	1.476	-6.522	-18.239	-0.984	0.0	0.0
9	12	-0.300	-12.747	-27.543	-1.218	0.0	0.0
9	13	1.845	-10.992	-30.462	-1.440	0.0	0.0
9	14	1.872	-10.992	-30.191	-1.424	0.0	0.0
9	15	1.873	-8.864	-26.288	-1.260	0.0	0.0
9	16	-0.571	-11.108	-23.310	-1.028	0.0	0.0
9	17	-0.569	-11.902	-24.691	-1.089	0.0	0.0
9	18	-0.593	-12.003	-24.727	-1.096	0.0	0.0
9	19	1.796	-3.401	-11.970	-0.833	0.0	0.0
9	20	1.254	-3.899	-11.308	-0.780	0.0	0.0
10	11	-0.057	0.128	0.386	0.015	0.0	0.0
10	12	-1.833	-6.097	-8.918	-0.219	0.0	0.0
10	13	0.312	-4.342	-11.837	-0.441	0.0	0.0
10	14	0.339	-4.342	-11.566	-0.425	0.0	0.0
10	15	0.340	-2.214	-7.663	-0.261	0.0	0.0
10	16	-2.104	-4.458	-4.685	-0.029	0.0	0.0
10	17	-2.102	-5.252	-6.066	-0.090	0.0	0.0
10	18	-2.126	-5.353	-6.102	-0.097	0.0	0.0
10	19	0.263	3.249	6.655	0.166	0.0	0.0
10	20	-0.279	2.751	7.317	0.219	0.0	0.0
11	12	-1.776	-6.225	-9.304	-0.234	0.0	0.0
11	13	0.369	-4.470	-12.223	-0.456	0.0	0.0
11	14	0.396	-4.470	-11.952	-0.440	0.0	0.0
11	15	0.397	-2.342	-8.049	-0.276	0.0	0.0
11	16	-2.047	-4.566	-5.071	-0.044	0.0	0.0
11	17	-2.045	-5.280	-6.452	-0.105	0.0	0.0
11	18	-2.069	-5.481	-6.488	-0.112	0.0	0.0
11	19	0.320	3.121	6.269	0.151	0.0	0.0
11	20	-0.222	2.623	6.931	0.204	0.0	0.0
12	13	2.145	1.755	-2.919	-0.222	0.0	0.0
12	14	2.172	1.755	-2.648	-0.206	0.0	0.0
12	15	2.173	3.883	1.255	-0.042	0.0	0.0
12	16	-0.271	1.639	4.253	0.190	0.0	0.0
12	17	-0.269	0.845	2.852	0.129	0.0	0.0
12	18	-0.293	0.744	2.816	0.122	0.0	0.0
12	19	2.096	9.346	15.573	0.385	0.0	0.0
12	20	1.554	8.848	16.235	0.438	0.0	0.0
13	14	0.027	0.0	0.271	0.016	0.0	0.0
13	15	0.028	2.128	4.174	0.180	0.0	0.0

* * STRESS COMPONENT RANGES - NOTE THAT A TRANSIENT NUMBER OF ZERO IMPLIES NULL CONDITIONS * *

* * THESE VALUES FOUND BY SUBTRACTING COMPONENTS OF THE TRANSIENT PAIRS

* * NOTE THAT IF AXISYMMETRIC STRESS DATA IS USED-SUCH AS SAAS3 OUTPUT-STRESS COLUMNS X,Y,Z, AND XY CORRESPOND TO R,Z,T, AND RZ STRESSES, RESPECTIVELY

TRAN.	PAIR	SIG X	SIG Y	SIG Z	TAU XY	TAU XZ	TAU YZ
13	16	-2.416	-0.116	7.152	0.412	0.0	0.0
13	17	-2.414	-0.910	5.771	0.351	0.0	0.0
13	18	-2.438	-1.011	5.736	0.344	0.0	0.0
13	19	-0.049	7.591	18.492	0.607	0.0	0.0
13	20	-0.591	7.093	19.154	0.660	0.0	0.0
14	15	0.001	2.128	3.903	0.164	0.0	0.0
14	16	-2.443	-0.116	6.881	0.396	0.0	0.0
14	17	-2.441	-0.910	5.500	0.335	0.0	0.0
14	18	-2.465	-1.011	5.464	0.328	0.0	0.0
14	19	-0.076	7.591	18.221	0.591	0.0	0.0
14	20	-0.618	7.093	18.883	0.644	0.0	0.0
15	16	-2.444	-2.244	2.978	0.232	0.0	0.0
15	17	-2.442	-3.038	1.597	0.171	0.0	0.0
15	18	-2.466	-3.139	1.561	0.164	0.0	0.0
15	19	-0.077	5.463	14.318	0.427	0.0	0.0
15	20	-0.619	4.965	14.980	0.480	0.0	0.0
16	17	0.002	-0.794	-1.381	-0.061	0.0	0.0
16	18	-0.022	-0.895	-1.417	-0.068	0.0	0.0
16	19	2.367	7.707	11.340	0.195	0.0	0.0
16	20	1.825	7.209	12.002	0.248	0.0	0.0
17	18	-0.024	-0.101	-0.036	-0.007	0.0	0.0
17	19	2.365	8.501	12.721	0.256	0.0	0.0
17	20	1.823	8.003	13.383	0.309	0.0	0.0
18	19	2.389	8.602	12.757	0.263	0.0	0.0
18	20	1.847	8.104	13.419	0.316	0.0	0.0
19	20	-0.542	-0.498	0.662	0.053	0.0	0.0

* * COEFICIENTS FOR TRIAXIAL STRESS EQUATION - CORRELATE COLUMN HEADINGS TO FORM AX**3+BX**2+CX+D=0

TRAN.	PAIR	A	B	C	D
1	0	1.000	-0.4835D 01	0.0	0.0
2	0	1.000	-0.8750D 01	0.0	0.0
3	0	1.000	-0.6934D 01	0.0	0.0
4	0	1.000	-0.6090D 00	0.0	0.0
5	0	1.000	-0.1395D 01	0.0	0.0
6	0	1.000	-0.1040D 01	0.0	0.0
7	0	1.000	-0.1023D 03	0.2529D 04	-0.1735D 05
8	0	1.000	0.8078D 01	0.5635D 01	-0.2613D 02
9	0	1.000	0.1566D 02	0.6811D 02	0.5843D 02
10	0	1.000	-0.8078D 01	-0.2441D 02	0.1630D 02
11	0	1.000	-0.7621D 01	-0.2387D 02	0.1189D 02
12	0	1.000	-0.2493D 02	0.1034D 03	0.1217D 03
13	0	1.000	-0.2395D 02	0.2461D 02	0.3434D 03
14	0	1.000	-0.2365D 02	0.2343D 02	0.3414D 03
15	0	1.000	-0.1762D 02	-0.1503D 02	0.1588D 03
16	0	1.000	-0.1933D 02	0.6178D 02	0.4955D 02
17	0	1.000	-0.2150D 02	0.8017D 02	0.6338D 02
18	0	1.000	-0.2166D 02	0.8248D 02	0.6237D 02
19	0	1.000	0.2089D 01	-0.1274D 02	-0.2952D 02
20	0	1.000	0.1711D 01	-0.8531D 01	-0.1616D 02
1	2	1.000	0.3915D 01	0.0	0.0
1	3	1.000	0.2099D 01	0.0	0.0
1	4	1.000	-0.4226D 01	0.0	0.0
1	5	1.000	-0.3440D 01	0.0	0.0
1	6	1.000	-0.3795D 01	0.0	0.0
1	7	1.000	0.9747D 02	0.2109D 04	0.1130D 05
1	8	1.000	-0.1291D 02	0.1287D 02	0.4552D 02
1	9	1.000	-0.2050D 02	0.1141D 03	-0.1064D 03
1	10	1.000	0.3243D 01	-0.6101D 02	0.1193D 03
1	11	1.000	0.2786D 01	-0.5889D 02	0.1159D 03
1	12	1.000	0.2009D 02	0.1485D 02	-0.3888D 02
1	13	1.000	0.1911D 02	-0.6772D 02	-0.1351D 02
1	14	1.000	0.1881D 02	-0.6746D 02	-0.1767D 02
1	15	1.000	0.1278D 02	-0.8701D 02	0.1072D 03
1	16	1.000	0.1449D 02	-0.7650D 01	-0.4644D 01
1	17	1.000	0.1666D 02	0.4075D 01	-0.1417D 02
1	18	1.000	0.1682D 02	0.6089D 01	-0.1496D 02
1	19	1.000	-0.6924D 01	-0.1590D 02	0.8209D 02
1	20	1.000	-0.6546D 01	-0.1111D 02	0.5138D 02
2	3	1.000	-0.1816D 01	0.0	0.0
2	4	1.000	-0.8141D 01	0.0	0.0
2	5	1.000	-0.7355D 01	0.0	0.0
2	6	1.000	-0.7710D 01	0.0	0.0
2	7	1.000	0.9355D 02	0.1764D 04	0.6400D 04
2	8	1.000	-0.1683D 02	0.1873D 02	0.6123D 02
2	9	1.000	-0.2441D 02	0.1514D 03	-0.1452D 03

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* * COEFICIENTS FOR TRIAXIAL STRESS EQUATION - CORRELATE COLUMN HEADINGS TO FORM AX**3+BX**2+CX+D=C

TRAN.	PAIR	A	B	C	D
2	10	1.000	-0.6720D 00	-0.9065D 02	0.2291D 03
2	11	1.000	-0.1129D 01	-0.8724D 02	0.2193D 03
2	12	1.000	0.1618D 02	-0.5669D 02	0.2814D 02
2	13	1.000	0.1520D 02	-0.1425D 03	0.2445D 03
2	14	1.000	0.1490D 02	-0.1411D 03	0.2445D 03
2	15	1.000	0.8865D 01	-0.1453D 03	0.3227D 03
2	16	1.000	0.1058D 02	-0.6387D 02	0.3172D 02
2	17	1.000	0.1275D 02	-0.5754D 02	0.2567D 02
2	18	1.000	0.1291D 02	-0.5576D 02	0.2343D 02
2	19	1.000	-0.1084D 02	-0.1846D 02	0.1247D 03
2	20	1.000	-0.1046D 02	-0.1319D 02	0.7989D 02
3	4	1.000	-0.6325D 01	0.0	0.0
3	5	1.000	-0.5539D 01	0.0	0.0
3	6	1.000	-0.5894D 01	0.0	0.0
3	7	1.000	0.9537D 02	0.1922D 04	0.8672D 04
3	8	1.000	-0.1501D 02	0.1601D 02	0.5394D 02
3	9	1.000	-0.2260D 02	0.1341D 03	-0.1272D 03
3	10	1.000	0.1144D 01	-0.7690D 02	0.1782D 03
3	11	1.000	0.6870D 00	-0.7409D 02	0.1714D 03
3	12	1.000	0.1799D 02	-0.2361D 02	-0.2950D 01
3	13	1.000	0.1701D 02	-0.1078D 03	0.1225D 03
3	14	1.000	0.1671D 02	-0.1069D 03	0.1229D 03
3	15	1.000	0.1068D 02	-0.1193D 03	0.2227D 03
3	16	1.000	0.1239D 02	-0.3779D 02	0.1485D 02
3	17	1.000	0.1456D 02	-0.2896D 02	0.7187D 01
3	18	1.000	0.1473D 02	-0.2707D 02	0.5525D 01
3	19	1.000	-0.9023D 01	-0.1727D 02	0.1049D 03
3	20	1.000	-0.8645D 01	-0.1223D 02	0.6667D 02
4	5	1.000	0.7860D 00	0.0	0.0
4	6	1.000	0.4310D 00	0.0	0.0
4	7	1.000	0.1017D 03	0.2476D 04	0.1658D 05
4	8	1.000	-0.8687D 01	0.6546D 01	0.2857D 02
4	9	1.000	-0.1627D 02	0.7391D 02	-0.6448D 02
4	10	1.000	0.7469D 01	-0.2902D 02	0.7757D 00
4	11	1.000	0.7012D 01	-0.2826D 02	0.4203D 01
4	12	1.000	0.2432D 02	0.9227D 02	-0.1112D 03
4	13	1.000	0.2334D 02	0.1298D 02	-0.3025D 03
4	14	1.000	0.2304D 02	0.1199D 02	-0.3006D 03
4	15	1.000	0.1701D 02	-0.2407D 02	-0.1253D 03
4	16	1.000	0.1872D 02	0.5304D 02	-0.4389D 02
4	17	1.000	0.2089D 02	0.7059D 02	-0.5718D 02
4	18	1.000	0.2105D 02	0.7286D 02	-0.5639D 02
4	19	1.000	-0.2698D 01	-0.1314D 02	0.3614D 02
4	20	1.000	-0.2320D 01	-0.8855D 01	0.2061D 02
5	6	1.000	-0.3550D 00	0.0	0.0
5	7	1.000	0.1009D 03	0.2407D 04	0.1560D 05

* * COEFICIENTS FOR TRIAXIAL STRESS EQUATION - CORRELATE COLUMN HEADINGS TO FORM AX**3+BX**2+CX+D=0

TRAN.	PAIR	A	B	C	D
5	8	1.000	-0.9473D 01	0.7722D 01	0.3172D 02
5	9	1.000	-0.1706D 02	0.8139D 02	-0.7227D 02
5	10	1.000	0.6883D 01	-0.3497D 02	0.2282D 02
5	11	1.000	0.6226D 01	-0.3397D 02	0.2498D 02
5	12	1.000	0.2353D 02	0.7787D 02	-0.9777D 02
5	13	1.000	0.2255D 02	-0.2029D 01	-0.2497D 03
5	14	1.000	0.2225D 02	-0.2798D 01	-0.2480D 03
5	15	1.000	0.1622D 02	-0.3578D 02	-0.8204D 02
5	16	1.000	0.1793D 02	0.4175D 02	-0.3659D 02
5	17	1.000	0.2010D 02	0.5822D 02	-0.4918D 02
5	18	1.000	0.2026D 02	0.6044D 02	-0.4869D 02
5	19	1.000	-0.3484D 01	-0.1365D 02	0.4469D 02
5	20	1.000	-0.3106D 01	-0.9274D 01	0.2634D 02
6	7	1.000	0.1013D 03	0.2498D 04	0.1605D 05
6	8	1.000	-0.9118D 01	0.7191D 01	0.3030D 02
6	9	1.000	-0.1670D 02	0.7801D 02	-0.6875D 02
6	10	1.000	0.7038D 01	-0.3228D 02	0.1286D 02
6	11	1.000	0.6581D 01	-0.3140D 02	0.1559D 02
6	12	1.000	0.2389D 02	0.6438D 02	-0.1038D 03
6	13	1.000	0.2291D 02	0.4750D 01	-0.2735D 03
6	14	1.000	0.2261D 02	0.3876D 01	-0.2718D 03
6	15	1.000	0.1658D 02	-0.3049D 02	-0.1016D 03
6	16	1.000	0.1829D 02	0.4685D 02	-0.3989D 02
6	17	1.000	0.2046D 02	0.6350D 02	-0.5279D 02
6	18	1.000	0.2062D 02	0.6605D 02	-0.5217D 02
6	19	1.000	-0.3129D 01	-0.1342D 02	0.4083D 02
6	20	1.000	-0.2751D 01	-0.9085D 01	0.2375D 02
7	8	1.000	-0.1104D 03	0.3312D 04	-0.2951D 05
7	9	1.000	-0.1180D 03	0.3513D 04	-0.3030D 05
7	10	1.000	-0.9422D 02	0.2349D 04	-0.1631D 05
7	11	1.000	-0.9468D 02	0.2368D 04	-0.1653D 05
7	12	1.000	-0.7737D 02	0.1494D 04	-0.6642D 04
7	13	1.000	-0.7836D 02	0.1652D 04	-0.8736D 04
7	14	1.000	-0.7865D 02	0.1662D 04	-0.8806D 04
7	15	1.000	-0.8469D 02	0.1940D 04	-0.1192D 05
7	16	1.000	-0.8298D 02	0.1714D 04	-0.8941D 04
7	17	1.000	-0.8082D 02	0.1617D 04	-0.7803D 04
7	18	1.000	-0.8064D 02	0.1607D 04	-0.7682D 04
7	19	1.000	-0.1044D 03	0.2886D 04	-0.2298D 05
7	20	1.000	-0.1040D 03	0.2824D 04	-0.2193D 05
8	9	1.000	-0.7586D 01	-0.2001D 02	-0.7132D 01
8	10	1.000	0.1616D 02	0.6491D 02	0.3062D 01
8	11	1.000	0.1570D 02	0.6191D 02	0.6360D 01
8	12	1.000	0.3300D 02	0.2956D 03	0.4467D 03
8	13	1.000	0.3202D 02	0.2305D 03	-0.7270D 02
8	14	1.000	0.3173D 02	0.2266D 03	-0.7720D 02

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* * COEFICIENTS FOR TRIAXIAL STRESS EQUATION - CORRELATE COLUMN HEADINGS TC FORM AX**3+BX**2+CX+D=0

TRAN.	PAIR	A	B	C	D
8	15	1.000	0.2569D 02	0.1482D 03	-0.4965D 02
8	16	1.000	0.2740D 02	0.2130D 03	0.3439D 03
8	17	1.000	0.2958D 02	0.2456D 03	0.4037D 03
8	18	1.000	0.2974D 02	0.2485D 03	0.4124D 03
8	19	1.000	0.5989D 01	0.7491D 01	-0.2075D 01
8	20	1.000	0.6367D 01	0.9042D 01	0.2308D 01
9	10	1.000	0.2374D 02	0.8411D 02	-0.2085D 03
9	11	1.000	0.2329D 02	0.8144D 02	-0.1932D 03
9	12	1.000	0.4059D 02	0.3617D 03	0.6447D 02
9	13	1.000	0.3961D 02	0.2563D 03	-0.6809D 03
9	14	1.000	0.3931D 02	0.2527D 03	-0.6825D 03
9	15	1.000	0.3328D 02	0.1656D 03	-0.4782D 03
9	16	1.000	0.3499D 02	0.2775D 03	0.1232D 03
9	17	1.000	0.3716D 02	0.3135D 03	0.1379D 03
9	18	1.000	0.3732D 02	0.3174D 03	0.1463D 03
9	19	1.000	0.1358D 02	0.1241D 02	-0.8142D 02
9	20	1.000	0.1395D 02	0.2441D 02	-0.6217D 02
10	11	1.000	-0.4570D 00	0.1988D-01	0.2903D-02
10	12	1.000	0.1685D 02	0.8185D 02	0.9924D 02
10	13	1.000	0.1587D 02	0.4615D 02	-0.1834D 02
10	14	1.000	0.1557D 02	0.4465D 02	-0.1911D 02
10	15	1.000	0.9537D 01	0.1354D 02	-0.6290D 01
10	16	1.000	0.1125D 02	0.4012D 02	0.4394D 02
10	17	1.000	0.1342D 02	0.5564D 02	0.6692D 02
10	18	1.000	0.1358D 02	0.5701D 02	0.6939D 02
10	19	1.000	-0.1017D 02	0.2420D 02	-0.5503D 01
10	20	1.000	-0.9789D 01	0.1727D 02	0.5967D 01
11	12	1.000	0.1731D 02	0.8544D 02	0.1024D 03
11	13	1.000	0.1632D 02	0.4827D 02	-0.2270D 02
11	14	1.000	0.1603D 02	0.4673D 02	-0.2347D 02
11	15	1.000	0.9994D 01	0.1465D 02	-0.8097D 01
11	16	1.000	0.1170D 02	0.4302D 02	0.4759D 02
11	17	1.000	0.1388D 02	0.5890D 02	0.7091D 02
11	18	1.000	0.1404D 02	0.6031D 02	0.7349D 02
11	19	1.000	-0.9710D 01	0.2255D 02	-0.6118D 01
11	20	1.000	-0.9332D 01	0.1602D 02	0.4324D 01
12	13	1.000	-0.9810D 00	-0.7669D 01	0.1084D 02
12	14	1.000	-0.1279D 01	-0.6629D 01	0.9981D 01
12	15	1.000	-0.7311D 01	0.1604D 02	-0.1059D 02
12	16	1.000	-0.5601D 01	0.5310D 01	0.2033D 01
12	17	1.000	-0.3428D 01	0.1399D 01	0.6957D 00
12	18	1.000	-0.3267D 01	0.1037D 01	0.6558D 00
12	19	1.000	-0.2702D 02	0.1976D 03	-0.3028D 03
12	20	1.000	-0.2664D 02	0.1824D 03	-0.2201D 03
13	14	1.000	-0.2980D 00	0.7061D-02	0.6938D-04
13	15	1.000	-0.6330D 01	0.9026D 01	-0.1155D 00

* * COEFICIENTS FOR TRIAXIAL STRESS EQUATION - CORRELATE COLUMN HEADINGS TO FORM AX**3+BX**2+CX+D=0

TRAN.	PAIR	A	B	C	D
13	16	1.000	-0.4620D 01	-0.1800D 02	-0.7904D 00
13	17	1.000	-0.2447D 01	-0.1711D 02	-0.1197D 02
13	18	1.000	-0.2286D 01	-0.1743D 02	-0.1346D 02
13	19	1.000	-0.2603D 02	0.1387D 03	0.1369D 02
13	20	1.000	-0.2566D 02	0.1199D 03	0.8864D 02
14	15	1.000	-0.6032D 01	0.8285D 01	0.9667D-01
14	16	1.000	-0.4322D 01	-0.1748D 02	-0.8709D 00
14	17	1.000	-0.2149D 01	-0.1632D 02	-0.1160D 02
14	18	1.000	-0.1988D 01	-0.1661D 02	-0.1303D 02
14	19	1.000	-0.2574D 02	0.1360D 03	0.1689D 02
14	20	1.000	-0.2536D 02	0.1175D 03	0.9060D 02
15	16	1.000	0.1710D 01	-0.8530D 01	-0.1617D 02
15	17	1.000	0.3883D 01	-0.1362D 01	-0.1180D 02
15	18	1.000	0.4044D 01	-0.1036D 01	-0.1204D 02
15	19	1.000	-0.1970D 02	0.7651D 02	0.8633D 01
15	20	1.000	-0.1933D 02	0.6180D 02	0.4949D 02
16	17	1.000	0.2173D 01	0.1088D 01	-0.7332D-02
16	18	1.000	0.2334D 01	0.1314D 01	0.2135D-01
16	19	1.000	-0.2141D 02	0.1324D 03	-0.2064D 03
16	20	1.000	-0.2104D 02	0.1215D 03	-0.1572D 03
17	18	1.000	0.1610D 00	0.6875D-02	0.6550D-04
17	19	1.000	-0.2359D 02	0.1583D 03	-0.2549D 03
17	20	1.000	-0.2321D 02	0.1460D 03	-0.1940D 03
18	19	1.000	-0.2375D 02	0.1607D 03	-0.2613D 03
18	20	1.000	-0.2337D 02	0.1484D 03	-0.1995D 03
19	20	1.000	0.3780D 00	-0.4214D 00	-0.1768D 00

* * PRINCIPAL STRESSES, MAXIMUM STRESS INTENSITY AND ALTERNATING STRESS INTENSITY FOLLOW* *

* * NOTE THAT ALL STRESSES IN THIS PROGRAM ARE IN KSI * *

* NOTE THAT ALTERNATING STRESS INTENSITY HAS BEEN MULTIPLIED BY STRESS CONCENTRATION FACTOR AND E RATIO * *

TRAN.	PAIR	SIGMA 1	SIGMA 2	SIGMA 3	S INT	ALT S.I.
1	0	0.0	4.835	0.0	4.835	2.334
2	0	0.0	8.750	0.0	8.750	4.224
3	0	0.0	6.934	0.0	6.934	3.347
4	0	0.0	0.609	0.000	0.609	0.294
5	0	0.0	1.395	0.0	1.395	0.673
6	0	0.0	1.040	0.0	1.040	0.502
7	0	69.500	20.801	11.999	57.501	27.756
8	0	1.390	-2.833	-6.635	8.025	3.874
9	0	-1.131	-6.203	-8.330	7.199	3.475
10	0	10.295	0.569	-2.786	13.081	6.314
11	0	9.909	0.440	-2.728	12.637	6.100
12	0	19.213	6.663	-0.950	20.163	9.733
13	0	22.132	4.948	-3.135	25.267	12.197
14	0	21.861	4.945	-3.159	25.020	12.077
15	0	17.958	2.807	-3.150	21.108	10.189
16	0	14.980	5.006	-0.661	15.641	7.550
17	0	16.361	5.804	-0.667	17.028	8.220
18	0	16.397	5.906	-0.644	17.041	8.226
19	0	3.640	-2.555	-3.174	6.814	3.289
20	0	2.978	-2.093	-2.596	5.574	2.691
1	2	0.0	0.0	-3.915	3.915	1.890
1	3	0.0	0.0	-2.099	2.099	1.013
1	4	0.0	4.226	0.000	4.226	2.040
1	5	0.0	3.440	0.0	3.440	1.660
1	6	0.0	3.795	0.0	3.795	1.832
1	7	-8.242	-19.723	-69.500	61.258	29.569
1	8	11.440	2.863	-1.390	12.830	6.193
1	9	11.009	8.330	1.160	9.848	4.754
1	10	4.446	2.606	-10.295	14.741	7.115
1	11	4.556	2.567	-9.909	14.465	6.982
1	12	1.050	-1.928	-19.213	20.263	9.781
1	13	3.277	-0.255	-22.132	25.409	12.265
1	14	3.294	-0.245	-21.861	25.155	12.143
1	15	3.444	1.734	-17.958	21.402	10.331
1	16	0.853	-0.363	-14.980	15.833	7.643
1	17	0.792	-1.094	-16.361	17.153	8.280
1	18	0.765	-1.192	-16.397	17.162	8.284
1	19	7.595	2.969	-3.640	11.235	5.423
1	20	7.090	2.434	-2.978	10.068	4.860
2	3	0.0	1.816	0.0	1.816	0.877
2	4	0.0	8.141	0.000	8.141	3.930
2	5	0.0	7.355	0.000	7.355	3.550
2	6	0.0	7.710	0.0	7.710	3.722
2	7	-4.779	-19.271	-69.500	64.721	31.241
2	8	15.348	2.870	-1.390	16.738	8.079
2	9	14.915	8.330	1.169	13.746	6.635

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* NOTE THAT ALTERNATING STRESS INTENSITY HAS BEEN MULTIPLIED BY STRESS CONCENTRATION FACTOR AND E RATIO * *

TRAN.	PAIR	SIGMA 1	SIGMA 2	SIGMA 3	S INT	ALT S.I.
2	10	8.279	2.688	-10.295	18.574	8.966
2	11	8.404	2.634	-9.909	18.313	8.840
2	12	2.436	0.601	-19.213	21.649	10.450
2	13	4.459	2.478	-22.132	26.591	12.835
2	14	4.452	2.512	-21.861	26.313	12.701
2	15	6.191	2.902	-17.958	24.149	11.657
2	16	3.856	0.549	-14.980	18.836	9.092
2	17	3.108	0.505	-16.361	19.469	9.398
2	18	3.014	0.474	-16.397	19.411	9.370
2	19	11.501	2.978	-3.640	15.141	7.309
2	20	11.000	2.439	-2.978	13.978	6.747
3	4	0.0	6.325	0.000	6.325	3.053
3	5	0.0	5.539	0.000	5.539	2.674
3	6	0.0	5.894	0.000	5.894	2.845
3	7	-6.415	-19.451	-69.500	63.085	30.451
3	8	13.535	2.867	-1.390	14.925	7.204
3	9	13.102	8.330	1.166	11.937	5.762
3	10	6.481	2.670	-10.295	16.776	8.098
3	11	6.603	2.619	-9.909	16.512	7.970
3	12	1.336	-0.115	-19.213	20.549	9.919
3	13	3.570	1.551	-22.132	25.702	12.407
3	14	3.576	1.572	-21.861	25.437	12.279
3	15	4.553	2.724	-17.958	22.511	10.866
3	16	2.122	0.467	-14.980	17.102	8.255
3	17	1.505	0.292	-16.361	17.866	8.624
3	18	1.433	0.239	-16.397	17.830	8.606
3	19	9.688	2.975	-3.640	13.328	6.433
3	20	9.186	2.437	-2.978	12.164	5.872
4	5	0.0	0.0	-0.786	0.786	0.379
4	6	0.0	-0.000	-0.431	0.431	0.208
4	7	-11.575	-20.616	-69.500	57.925	27.961
4	8	7.237	2.840	-1.390	8.627	4.164
4	9	8.330	6.806	1.137	7.193	3.472
4	10	2.799	0.027	-10.295	13.094	6.321
4	11	2.742	0.155	-9.909	12.651	6.107
4	12	0.955	-6.059	-19.213	20.168	9.735
4	13	3.144	-4.348	-22.132	25.276	12.200
4	14	3.166	-4.343	-21.861	25.027	12.081
4	15	3.160	-2.208	-17.958	21.118	10.194
4	16	0.666	-4.402	-14.980	15.646	7.552
4	17	0.672	-5.200	-16.361	17.033	8.222
4	18	0.649	-5.302	-16.397	17.046	8.228
4	19	-3.640	3.506	2.832	7.146	3.450
4	20	-2.978	2.957	2.341	5.935	2.865
5	6	0.0	0.355	0.0	0.355	0.171
5	7	-11.003	-20.402	-69.500	58.497	28.237

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TRAN.	PAIR	SIGMA 1	SIGMA 2	SIGMA 3	S INT	ALT S.I.
5	8	8.016	2.847	-1.390	9.406	4.540
5	9	8.330	7.585	1.144	7.186	3.469
5	10	2.828	0.784	-10.295	13.123	6.335
5	11	2.775	0.908	-9.909	12.684	6.122
5	12	0.964	-5.282	-19.213	20.177	9.739
5	13	3.156	-3.574	-22.132	25.288	12.207
5	14	3.178	-3.569	-21.861	25.039	12.087
5	15	3.176	-1.438	-17.958	21.134	10.202
5	16	0.674	-3.624	-14.980	15.654	7.556
5	17	0.680	-4.422	-16.361	17.041	8.226
5	18	0.656	-4.523	-16.397	17.053	8.232
5	19	4.203	2.921	-3.640	7.843	3.786
5	20	3.682	2.402	-2.978	6.660	3.215
6	7	-11.264	-20.496	-69.500	58.236	28.110
6	8	7.664	2.844	-1.390	9.054	4.370
6	9	8.330	7.233	1.141	7.189	3.470
6	10	2.813	0.444	-10.295	13.108	6.327
6	11	2.757	0.571	-9.909	12.666	6.114
6	12	0.960	-5.633	-19.213	20.173	9.737
6	13	3.150	-3.923	-22.132	25.282	12.204
6	14	3.173	-3.919	-21.861	25.034	12.084
6	15	3.168	-1.785	-17.958	21.126	10.198
6	16	0.670	-3.975	-14.980	15.650	7.554
6	17	0.676	-4.773	-16.361	17.037	8.224
6	18	0.653	-4.875	-16.397	17.050	8.230
6	19	3.873	2.896	-3.640	7.513	3.627
6	20	3.343	2.386	-2.978	6.321	3.051
7	8	68.110	24.795	17.473	50.637	24.443
7	9	77.830	23.724	16.410	61.420	29.648
7	10	59.205	23.080	11.937	47.268	22.816
7	11	59.591	23.050	12.038	47.553	22.954
7	12	50.287	20.709	6.378	43.909	21.195
7	13	47.368	22.952	8.035	39.333	18.986
7	14	47.639	22.965	8.049	39.590	19.110
7	15	51.542	23.154	9.989	41.553	20.058
7	16	54.520	20.573	7.882	46.638	22.512
7	17	53.139	20.501	7.162	45.977	22.193
7	18	53.103	20.471	7.067	46.036	22.221
7	19	65.860	23.975	14.554	51.306	24.765
7	20	66.522	23.397	14.092	52.430	25.308
8	9	9.720	-0.431	-1.703	11.423	5.514
8	10	-0.048	-7.203	-8.905	8.857	4.275
8	11	-0.106	-7.074	-8.519	8.413	4.061
8	12	-1.885	-13.296	-17.823	15.938	7.693
8	13	0.303	-11.584	-20.742	21.045	10.158
8	14	0.326	-11.580	-20.471	20.797	10.039

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TRAN.	PAIR	SIGMA 1	SIGMA 2	SIGMA 3	S INT	ALT S.I.
8	15	0.317	-9.442	-16.568	16.885	8.151
8	16	-2.175	-11.638	-13.590	11.415	5.510
8	17	-2.168	-12.437	-14.971	12.803	6.180
8	18	-2.192	-12.538	-15.007	12.815	6.186
8	19	0.232	-2.250	-3.971	4.203	2.029
8	20	-0.326	-1.588	-4.453	4.126	1.992
9	10	1.653	-6.770	-18.625	20.278	9.788
9	11	1.595	-6.641	-18.239	19.834	9.574
9	12	-0.182	-12.865	-27.543	27.361	13.207
9	13	2.005	-11.152	-30.462	32.467	15.672
9	14	2.028	-11.148	-30.191	32.219	15.552
9	15	2.019	-9.010	-26.288	28.307	13.664
9	16	-0.472	-11.207	-23.310	22.838	11.024
9	17	-0.465	-12.006	-24.691	24.226	11.694
9	18	-0.489	-12.107	-24.727	24.238	11.700
9	19	1.926	-3.531	-11.970	13.896	6.708
9	20	1.369	-4.014	-11.308	12.677	6.119
10	11	0.386	0.129	-0.058	0.444	0.214
10	12	-1.822	-6.108	-8.918	7.096	3.425
10	13	0.353	-4.383	-11.837	12.190	5.884
10	14	0.377	-4.380	-11.566	11.943	5.765
10	15	0.366	-2.240	-7.663	8.029	3.876
10	16	-2.104	-4.458	-4.685	2.581	1.246
10	17	-2.099	-5.255	-6.066	3.967	1.915
10	18	-2.123	-5.356	-6.102	3.979	1.921
10	19	6.655	3.258	0.254	6.401	3.090
10	20	7.317	2.767	-0.295	7.612	3.674
11	12	-1.764	-6.237	-9.304	7.540	3.640
11	13	0.412	-4.513	-12.223	12.635	6.099
11	14	0.435	-4.509	-11.952	12.387	5.979
11	15	0.425	-2.370	-8.049	8.474	4.090
11	16	-2.046	-4.587	-5.071	3.025	1.460
11	17	-2.042	-5.383	-6.452	4.410	2.129
11	18	-2.065	-5.485	-6.488	4.423	2.135
11	19	6.269	3.129	0.312	5.957	2.876
11	20	6.931	2.638	-0.237	7.168	3.460
12	13	2.245	1.655	-2.919	5.164	2.493
12	14	-2.648	2.257	1.670	4.905	2.367
12	15	3.884	2.172	1.255	2.629	1.269
12	16	4.233	1.658	-0.290	4.523	2.183
12	17	2.852	0.860	-0.284	3.136	1.514
12	18	2.816	0.758	-0.307	3.123	1.508
12	19	15.573	9.366	2.076	13.497	6.515
12	20	16.235	8.874	1.528	14.707	7.099
13	14	0.271	0.034	-0.007	0.278	0.134
13	15	4.174	2.143	0.013	4.161	2.009

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TRAN.	PAIR	SIGMA 1	SIGMA 2	SIGMA 3	S INT	ALT S.I.
13	16	7.152	-0.044	-2.488	9.640	4.653
13	17	5.771	-0.832	-2.492	8.263	3.988
13	18	5.735	-0.932	-2.517	8.252	3.983
13	19	18.492	7.639	-0.097	18.589	8.973
13	20	19.154	7.149	-0.647	19.801	9.558
14	15	3.903	2.141	-0.012	3.915	1.890
14	16	6.881	-0.050	-2.509	9.390	4.532
14	17	5.500	-0.840	-2.511	8.011	3.867
14	18	5.464	-0.940	-2.536	8.000	3.861
14	19	18.221	7.636	-0.121	18.342	8.854
14	20	18.883	7.146	-0.671	19.554	9.439
15	16	2.978	-2.091	-2.597	5.575	2.691
15	17	1.597	-2.396	-3.084	4.681	2.259
15	18	1.561	-2.428	-3.177	4.738	2.287
15	19	14.318	5.496	-0.110	14.428	6.964
15	20	14.980	5.006	-0.660	15.640	7.549
16	17	0.007	-0.799	-1.381	1.388	0.670
16	18	-0.017	-0.900	-1.417	1.400	0.676
16	19	11.340	7.714	2.360	8.980	4.335
16	20	12.002	7.220	1.814	10.188	4.918
17	18	-0.101	-0.023	-0.037	0.079	0.038
17	19	12.721	8.512	2.354	10.367	5.004
17	20	13.383	8.018	1.808	11.575	5.587
18	19	12.757	8.613	2.378	10.379	5.010
18	20	13.419	8.120	1.831	11.588	5.593
19	20	0.662	-0.463	-0.577	1.239	0.598

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* * ALTERNATING STRESS INTENSITIES ORDERED FROM MAX TO MIN

* * NOTE THAT ZERO TRANSIENT NUMBER INDICATES NULL CONDITIONS

TRAN.	PAIR	SPECIFIED NO. CYCLES	ALT. S.I.	N	U	TRAN.	CYCLES REMAINING	TRAN	CYCLES REMAINING	TRAN. ELIMINATED
				2×10^5	.0012	2	0	7	130	2
2	7	370	31.241	3.4×10^5	.0015	3	1000	7	0	7
3	7	500	30.451							
7	9	260	29.648							
1	7	370	29.569							
5	7	100	28.237							
6	7	500	28.110							
4	7	500	27.961							
7	0	500	27.756							
7	20	500	25.308							
7	19	260	24.765							
7	8	260	24.443							
7	11	360	22.954							
7	10	360	22.816							
7	16	500	22.512							
7	18	500	22.221							
7	17	500	22.193							
7	12	500	21.195							
7	15	500	20.058							
7	14	500	19.110							
7	13	500	18.986							
9	13	260	15.672							
9	14	260	15.552							
9	15	260	13.664							
9	12	260	13.207							
2	13	370	12.835							
2	14	370	12.701							
3	13	1500	12.407							
3	14	1500	12.279							
1	13	370	12.265							
5	13	100	12.207							
6	13	1500	12.204							
4	13	1500	12.200							
13	0	1500	12.197							
1	14	370	12.143							
5	14	100	12.087							
6	14	1500	12.084							
4	14	1500	12.081							
14	0	1500	12.077							
9	18	260	11.700							
9	17	260	11.694							
2	15	370	11.657							
9	16	260	11.024							
3	15	1500	10.866							
2	12	370	10.450							
1	15	370	10.331							
5	15	100	10.202							

$\Sigma U = .0027$

NO FURTHUR USAGE BELOW 26.0 KSI

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* * ALTERNATING STRESS INTENSITIES ORDERED FROM MAX TO MIN

* * NOTE THAT ZERO TRANSIENT NUMBER INDICATES NULL CONDITIONS

TRAN.	PAIR	SPECIFIED NO. CYCLES	ALT. S.I.
6	15	1500	10.198
4	15	1500	10.194
15	0	1500	10.189
8	13	260	10.158
8	14	260	10.039
3	12	1500	9.919
9	10	260	9.788
1	12	370	9.781
5	12	100	9.739
6	12	1500	9.737
4	12	1500	9.735
12	0	1500	9.733
9	11	260	9.574
13	20	1500	9.558
14	20	1500	9.439
2	17	370	9.398
2	18	370	9.370
2	16	370	9.092
13	19	260	8.973
2	10	360	8.966
14	19	260	8.854
2	11	360	8.840
3	17	1500	8.624
3	18	1500	8.606
1	18	370	8.284
1	17	370	8.280
3	16	1500	8.255
5	18	100	8.232
6	18	1500	8.230
4	18	1500	8.228
18	0	1500	8.226
5	17	100	8.226
6	17	1500	8.224
4	17	1500	8.222
17	0	1500	8.220
8	15	260	8.151
3	10	360	8.098
2	8	260	8.079
3	11	360	7.970
8	12	260	7.693
1	16	370	7.643
5	16	100	7.556
6	16	1500	7.554
4	16	1500	7.552
16	0	1500	7.550
15	20	1500	7.549

* * ALTERNATING STRESS INTENSITIES ORDERED FROM MAX TO MIN

* * NOTE THAT ZERO TRANSIENT NUMBER INDICATES NULL CONDITIONS

TRAN.	PAIR	SPECIFIED NO. CYCLES	ALT. S.I.
2	19	260	7.309
3	8	260	7.204
1	10	360	7.115
12	20	1500	7.099
1	11	360	6.982
15	19	260	6.964
2	20	370	6.747
9	19	260	6.708
2	9	260	6.635
12	19	260	6.515
3	19	260	6.433
5	10	100	6.335
6	10	360	6.327
4	10	360	6.321
10	0	360	6.314
1	8	260	6.193
8	18	260	6.186
8	17	260	6.180
5	11	100	6.122
9	20	260	6.119
6	11	360	6.114
4	11	360	6.107
11	0	360	6.100
11	13	360	6.099
11	14	360	5.979
10	13	360	5.884
3	20	1500	5.872
10	14	360	5.765
3	9	260	5.762
18	20	1500	5.593
17	20	1500	5.587
8	9	260	5.514
8	16	260	5.510
1	19	260	5.423
18	19	260	5.010
17	19	260	5.004
16	20	1500	4.918
1	20	370	4.860
1	9	260	4.754
13	16	1500	4.653
5	8	100	4.540
14	16	1500	4.532
6	8	260	4.370
16	19	260	4.335
8	10	260	4.275
2	0	370	4.224

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* * ALTERNATING STRESS INTENSITIES ORDERED FROM MAX TO MIN

* * NOTE THAT ZERO TRANSIENT NUMBER INDICATES NULL CONDITIONS

TRAN.	PAIR	SPECIFIED NO. CYCLES	ALT. S.I.
4	3	260	4.164
11	15	360	4.090
8	11	260	4.061
13	17	1500	3.988
13	18	1500	3.983
2	4	370	3.930
10	15	360	3.876
8	0	260	3.874
14	17	1500	3.867
14	18	1500	3.861
5	19	100	3.786
2	6	370	3.722
10	20	360	3.674
11	12	360	3.640
6	19	260	3.627
2	5	100	3.550
9	0	260	3.475
4	9	260	3.472
6	9	260	3.470
5	9	100	3.469
11	20	360	3.460
4	19	260	3.450
10	12	360	3.425
3	0	1500	3.347
19	0	260	3.289
5	20	100	3.215
10	19	260	3.090
3	4	1500	3.053
6	20	2600	3.051
11	19	260	2.876
4	20	1000000	2.865
3	6	1500	2.845
15	16	1500	2.691
20	0	1000000	2.691
3	5	100	2.674
12	13	1500	2.493
12	14	1500	2.367
1	0	370	2.334
15	18	1500	2.287
15	17	1500	2.259
12	16	1500	2.183
11	18	360	2.135
11	17	360	2.129
1	4	370	2.040
8	19	260	2.029
13	15	1500	2.009

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* * ALTERNATING STRESS INTENSITIES ORDERED FROM MAX TO MIN

* * NOTE THAT ZERO TRANSIENT NUMBER INDICATES NULL CONDITIONS

TRAN.	PAIR	SPECIFIED NO. CYCLES	ALT. S.I.
8	20	260	1.992
10	18	360	1.921
10	17	360	1.915
1	2	370	1.890
14	15	1500	1.890
1	6	370	1.832
1	5	100	1.660
12	17	1500	1.514
12	18	1500	1.508
11	16	360	1.460
12	15	1500	1.269
10	16	360	1.246
1	3	370	1.013
2	3	370	0.877
16	18	1500	0.676
5	0	100	0.673
16	17	1500	0.670
19	20	260	0.598
6	0	2600	0.502
4	5	100	0.379
4	0	1000000	0.294
10	11	360	0.214
4	6	2600	0.208
5	6	100	0.171
13	14	1500	0.134
17	18	1500	0.038

UPSET CONDITIONS

AS EXPRESSED IN PARAGRAPH NB-3223, UPSET CONDITIONS ARE ANALYZED AS NORMAL CONDITIONS.

EMERGENCY CONDITIONS

PARAGRAPH NB-3224 DEFINES STRESS LIMITS FOR EMERGENCY CONDITIONS. SAFE SHUTDOWN EARTHQUAKE (SSE) IS THE EMERGENCY LOAD WHICH MUST BE CONSIDERED. THE SSE LOADS ARE TWICE THE OBE LOADS AS PREVIOUSLY LISTED. THUS, THE NECESSARY LOADS AFTER BEING TRANSLATED TO THE AREA OF INTEREST ARE:

$M_x = -907.75$ IN-LB
$M_y = 754$ IN-LB
$M_z = 1632$ IN-LB
$F_y = 934$ LB.

USING THE SAME CALCULATIONS AS PREVIOUSLY SHOWN, THE PIPING STRESS DUE TO SSE IS FOUND AS FOLLOWS:

$$\sigma_{M_x} = M_x/Z_x = 908/1.305 = \pm 696 \text{ PSI}$$

$$\sigma_{M_z} = M_z/Z_z = 1632/1.305 = \pm 1251 \text{ PSI}$$

$$\sigma_{F_y} = F_y/A = 934/3.931 = 238 \text{ PSI}$$

$$\tau = M_y/Z_y = T_y/J = 754/2.611 = 289 \text{ PSI}$$

$$\sigma_b = \sigma_{F_y} + \sqrt{\sigma_{M_x}^2 + \sigma_{M_z}^2}$$

$$= 238 + \sqrt{(696)^2 + (1251)^2}$$

$$= 238 + 1432$$

$$\sigma_b = 1670 \text{ PSI}$$

$$\sigma_T = \sigma_0/2 + \sqrt{(\sigma_0/2)^2 + \tau_y^2}$$

$$= 835 + \sqrt{(835)^2 + (289)^2}$$

$$= 835 + 884$$

$$\sigma_T = 1719 \text{ PSI}$$

THE PRIMARY STRESS LIMIT FOR EMERGENCY CONDITIONS IS $1.2 S_M$

$S_M = 13{,}200$ PSI @ 650 °F

$1.2 (13200) = 15840$

$1719 < 15840$

THUS EMERGENCY CONDITION REQUIREMENTS ARE MET.

FAULTED CONDITIONS

AS LISTED IN APPENDIX F, PAGE 483, OF THE ASME CODE, THE PRIMARY STRESS LIMITS FOR FAULTED CONDITIONS ARE $2.4 S_M$ OR $0.7 S_u$, WHICHEVER IS LESS. AS WAS DONE IN THE REFERENCE 6 PIPING REPORT, LOCE AND SSE WILL BE COMBINED TO FORM THE FAULTED CONDITION LOADING. ORDINARILY, LOSS OF COOLANT ACCIDENT (LOCA) + SSE LOADS WOULD BE USED; HOWEVER, LOCA LOADS WERE NOT AVAILABLE SO LOCE + SSE LOADS WERE USED. AT THE AREA OF INTEREST THE LOADS ARE:

SSE:
$M_x = -908$ IN-LB
$M_y = 754$ "
$M_z = 1632$ "
$F_y = 934$ LB

LOCE:
$M_x = -391$ IN-LB
$M_y = 256$ "
$M_z = 1016$ "
$F_y = 772$ LB

USING CALCULATIONS SIMILAR TO THOSE SHOWN PREVIOUSLY:

$$\sigma_{M_x} = \pm 995 \text{ PSI}$$

$$\sigma_{M_z} = \pm 2029 \text{ PSI}$$

$$\sigma_{F_y} = 434 \text{ PSI}$$

$$\sigma_{M_y} = \pm 774 \text{ PSI}$$

$$\sigma_b = \sigma_{F_y} + \sqrt{\sigma_{M_x}^2 + \sigma_{M_z}^2}$$

$$= 434 + \sqrt{(995)^2 + (2029)^2}$$

$$= 434 + 2260$$

$$\sigma_b = 2694 \text{ PSI}$$

$$\sigma_T = \sigma_b/2 + \sqrt{(\sigma_b/2)^2 + \tau^2}$$

$$= 1347 + \sqrt{(1347)^2 + (774)^2}$$

$$= 1347 + 1554$$

$$\sigma_T = 2901 \text{ PSI}$$

$2.4\,S_M = 2.4(13{,}200) = 31{,}680$ PSI @ 650°F FOR SA 182

$.7\,S_y = .7(57{,}200) = 40{,}040$ PSI @ 650°F

$$2{,}901 < 31{,}680$$

THUS, FAULTED CONDITION REQUIREMENTS ARE MET.

APPENDIX B

SURGE NOZZLE CALCULATIONS

THIS APPENDIX DESCRIBES IN DETAIL THE LOFT PRESSURIZER SURGE NOZZLE COMPONENT ANALYSIS IN ACCORDANCE WITH SUBARTICLE NB-3200 OF SECTION III OF THE ASME CODE. IT SHOULD BE NOTED THAT ANY REFERENCES CITED IN THIS APPENDIX ARE TAKEN FROM THE MAIN LIST OF REFERENCES IN SECTION 5.0 OF THE MAIN BODY OF THE REPORT.

DESIGN CONDITIONS

DESIGN CONDITION STRESS ALLOWABLES ARE DEFINED BY PARAGRAPH NB-3221 OF THE ASME CODE. SINCE THE EMPHASIS OF THIS REPORT IS THE INCLUSION OF THE 450°F STEP TRANSIENT IN THE FATIGUE CALCULATIONS, THE DESIGN CONDITION CALCULATIONS SHOWN IN THE BTI REPORT (REFERENCE 2) WERE REVIEWED AND ACCEPTED AS ADEQUATE. BTI CALCULATED A GENERAL PRIMARY MEMBRANE STRESS VALUE OF 7,268 PSI AT THE PIPING CONNECTION AND 4,767 PSI IN THE NOZZLE SHELL. THE ALLOWABLE STRESS VALUES FOR THESE AREAS ARE 16,600 PSI AND 17,330 PSI, RESPECTIVELY.

NORMAL CONDITIONS

NORMAL CONDITION STRESS ALLOWABLES ARE DEFINED BY PARAGRAPH NB-3222 OF THE ASME CODE. NORMAL OPERATING CONDITIONS ANALYZED CONSIST OF THE FOLLOWING MECHANICAL AND THERMAL LOADS:

MECHANICAL LOADS:

- DEADWEIGHT
- STEADY STATE OPERATION
- SEISMIC (OBE)
- LOCE (MECH.)

THERMAL LOADS:

- 450°F STEP TRANSIENT
- LOCE

STEADY STATE FLUCTUATIONS
PLANT LOADING
HEAT - UP
COOLDOWN
OPERATING TEMP.

SINCE THE METHOD USED TO CALCULATE PRIMARY PLUS SECONDARY STRESSES FOR THE SPRAY NOZZLE VERIFIED BTI'S CALCULATION METHOD WITHIN REASONABLE LIMITS; THE BTI PROCEDURE WILL BE USED TO CALCULATE PRIMARY PLUS SECONDARY STRESSES FOR THE SURGE NOZZLE. BRIEFLY, THE BTI METHOD CALCULATES STRESS RANGES USING THE PRINCIPAL STRESS DIFFERENCES FOR EACH LOAD CASE. A MORE COMPLETE DESCRIPTION OF THIS PROCEDURE CAN BE SEEN IN THE BTI REPORT (REFERENCE 2).

TO COMPLETE ALL NECESSARY EVALUATION OF THE SURGE NOZZLE, THE SAAS III FINITE ELEMENT MODEL OF THE SURGE NOZZLE AND THERMAL SHIELD WAS RUN WITH THE 450 °F STEP THERMAL TRANSIENT. A PLOT OF THE FINITE ELEMENT MESH SHOWING NODE AND ELEMENT NUMBERING SCHEMES IS SHOWN IN SEVERAL SECTIONS IN FIGURE B1, PAGES, B3-B5. PRESSURE LOADS WERE USED TO CALCULATE AN EQUIVALENT END PRESSURE OF 6704 PSI AT THE PIPING CONNECTION, WHILE PRESSURIZER SHELL STRESSES WERE USED AS BOUNDARY CONDITIONS ALONG THE MODEL BOUNDARY IN THE SHELL. DATA PRESENTED IN REFERENCE 5 WAS USED TO DETERMINE CRITICAL TIME STEPS FOR SEVERAL PROFILES THROUGH THE MODEL. THE SAAS III RUN SHOWED THAT FOR ALL TIME STEPS THE AREAS OF MAXIMUM STRESS WERE THE TWO INCH END OF THE END FITTING (ELEMENTS 67-72, FIG. B1, PAGE B5) AND THE BI-METALLIC WELD CONNECTING THE END FITTING TO THE NOZZLE (ELEMENTS 150-159, FIGURE B1, PAGE B4). THUS, THESE TWO AREAS WILL BE THE SUBJECT OF THE REMAINING DISCUSSION. THE COMPLETE OUTPUT FROM THE SAASIII COMPUTER RUN IS SHOWN IN MICROFICHE FORM IN APPENDIX C. THE FOUR STRESS COMPONENTS RESULTING FROM THE SAAS III ANALYSIS ARE PLOTTED AND LINEARIZED IN FIGURES B2-B5, PAGES B6-B9, FOR PROFILE 1 (ELEMENTS 67-72) AND FIGURES B6-B9, PAGES B10-B13, FOR PROFILE 2 (ELEMENTS 150-159).

FIGURE B1
SAAS III

ELEMENT PLOT

SURGE NOZZLE 450 DEGREE STEP TRANSIENT

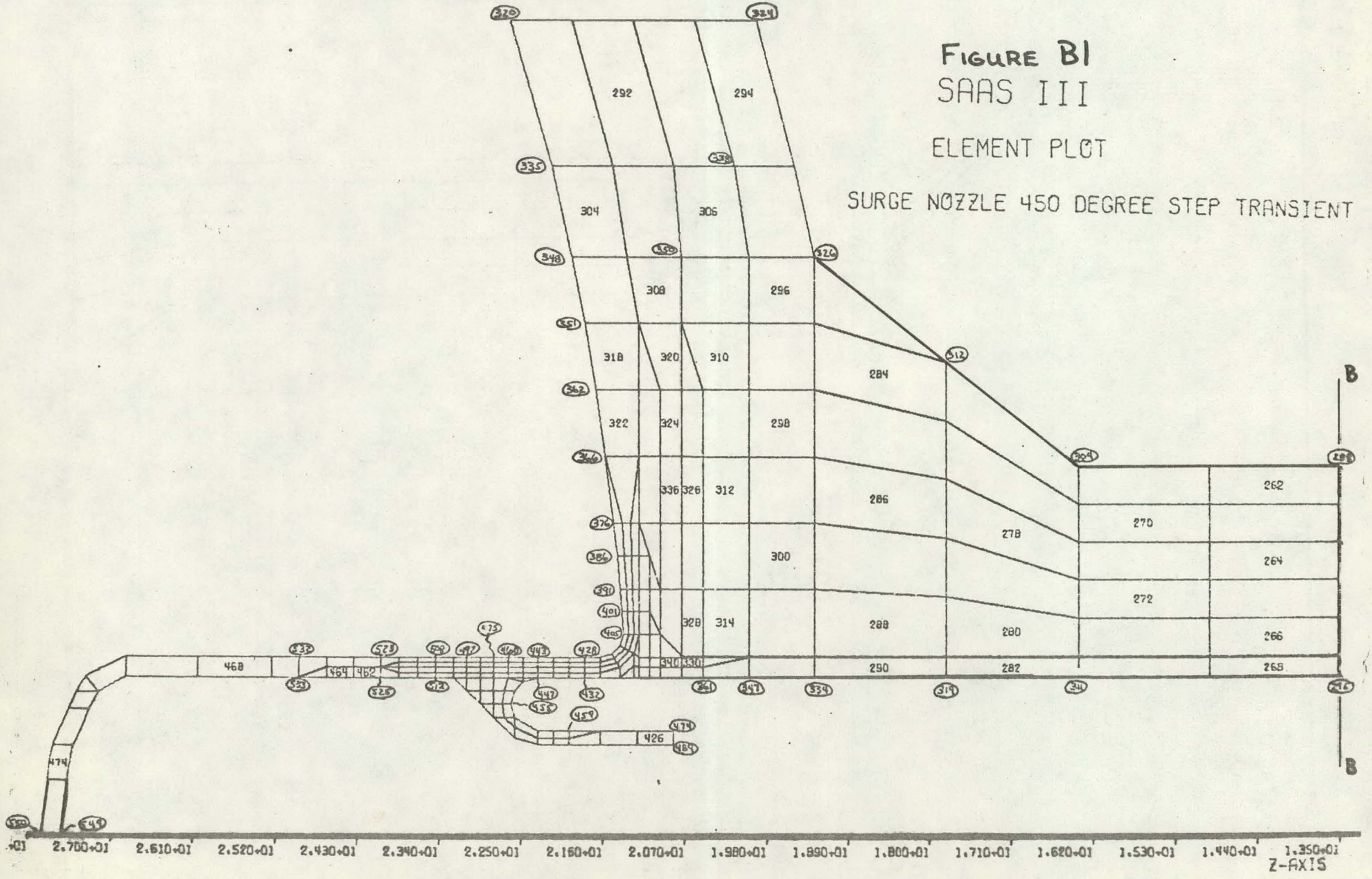

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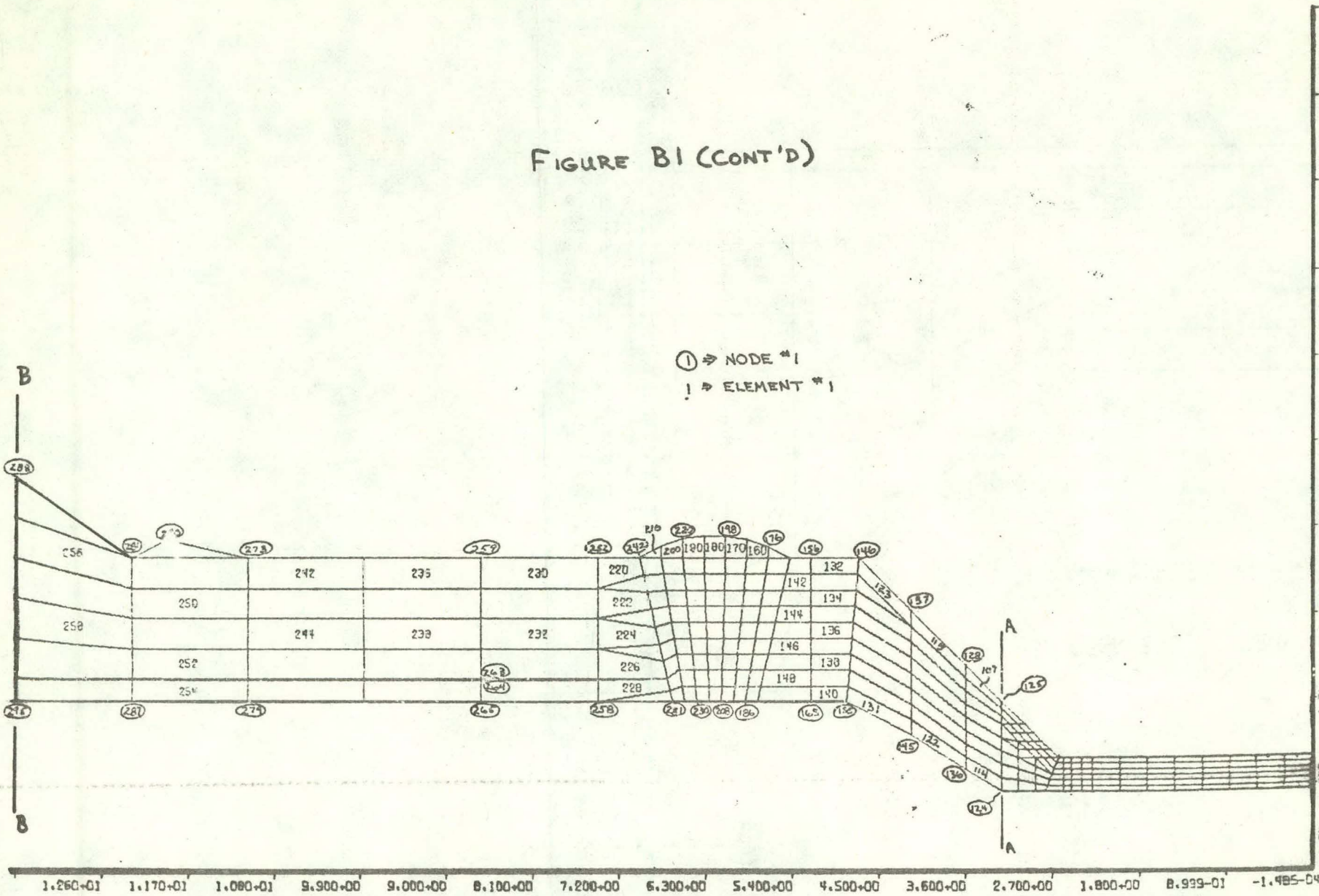
FIGURE B1 (CONT'D)



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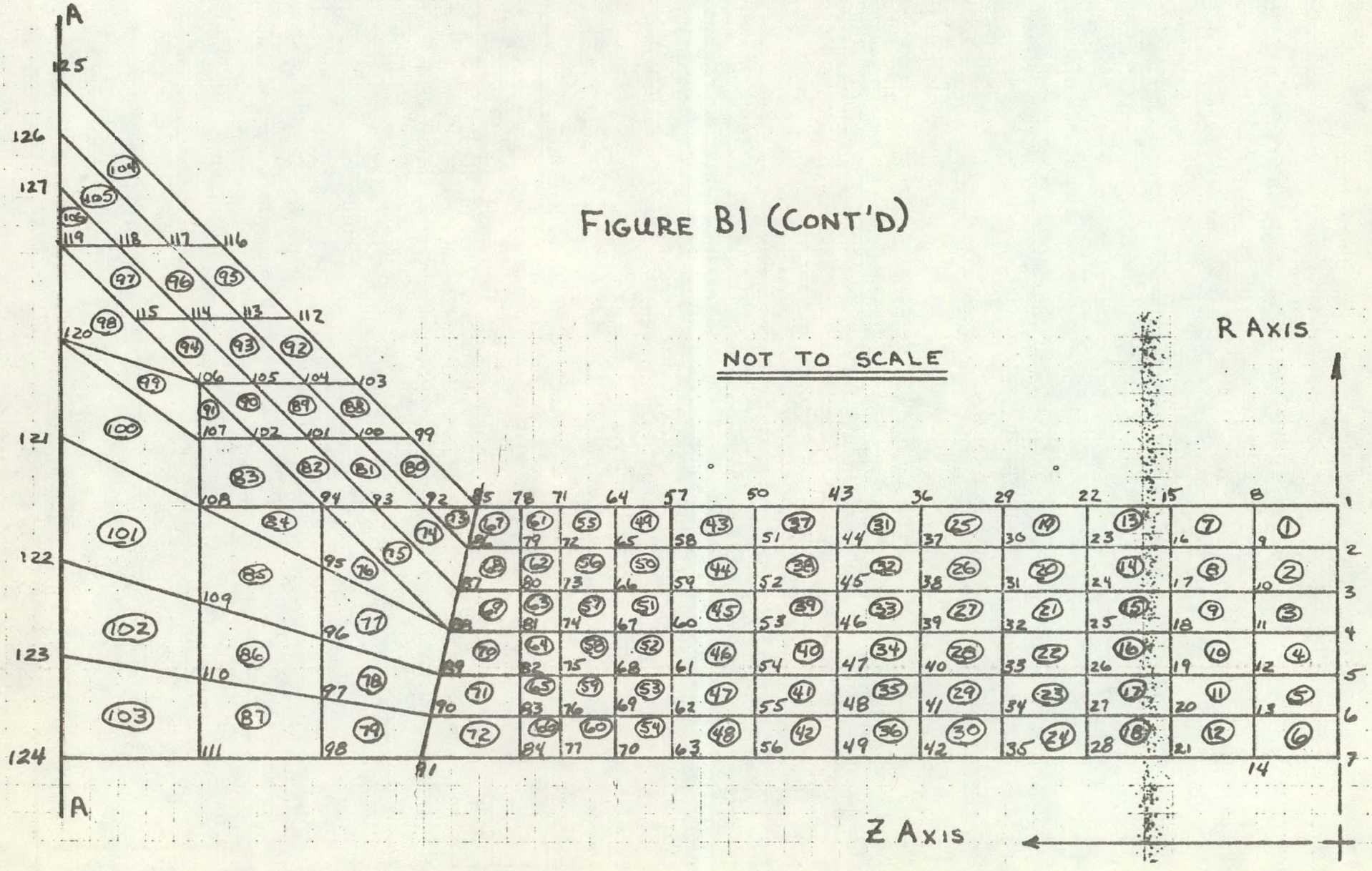

FIGURE B1 (CONT'D)

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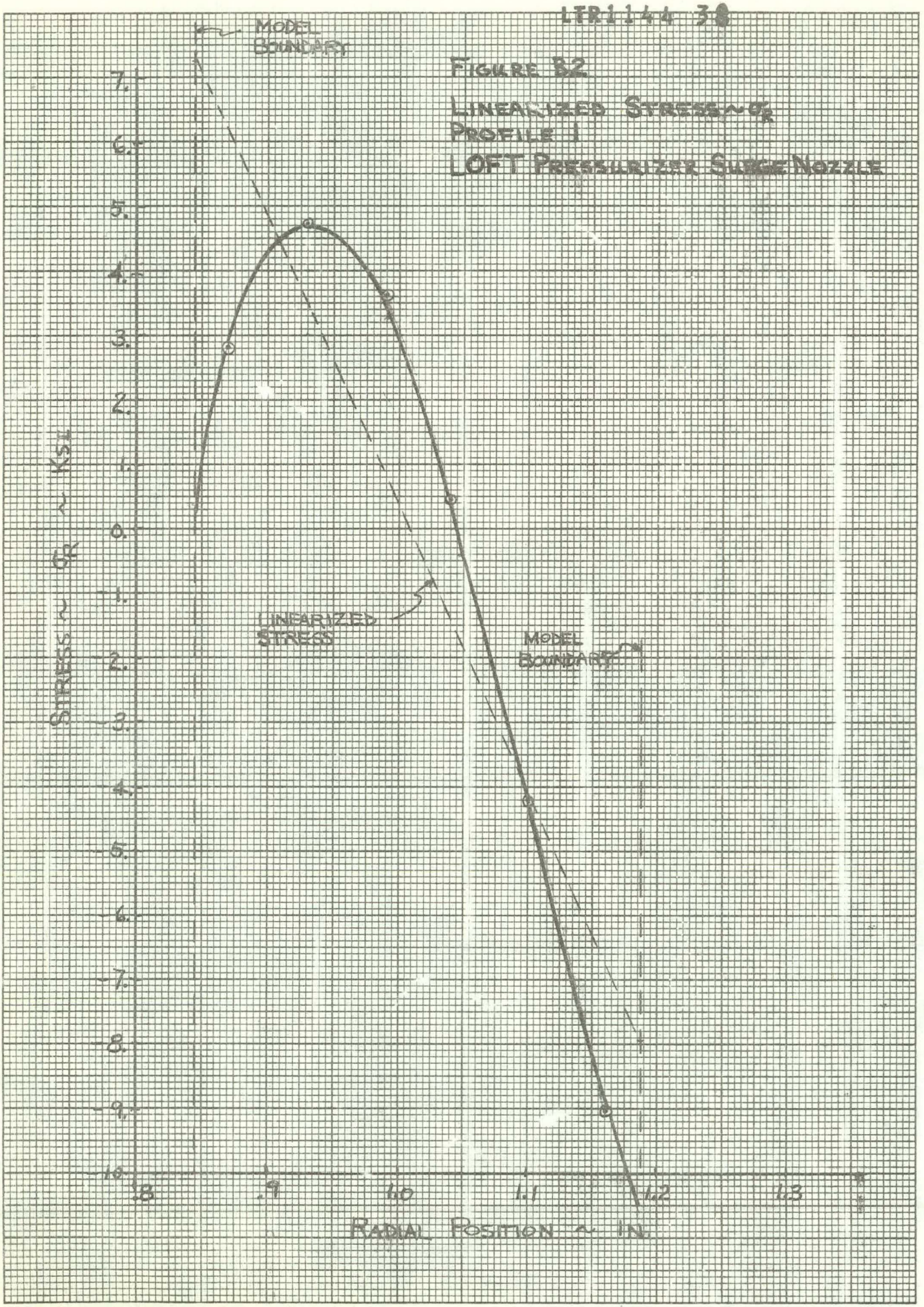
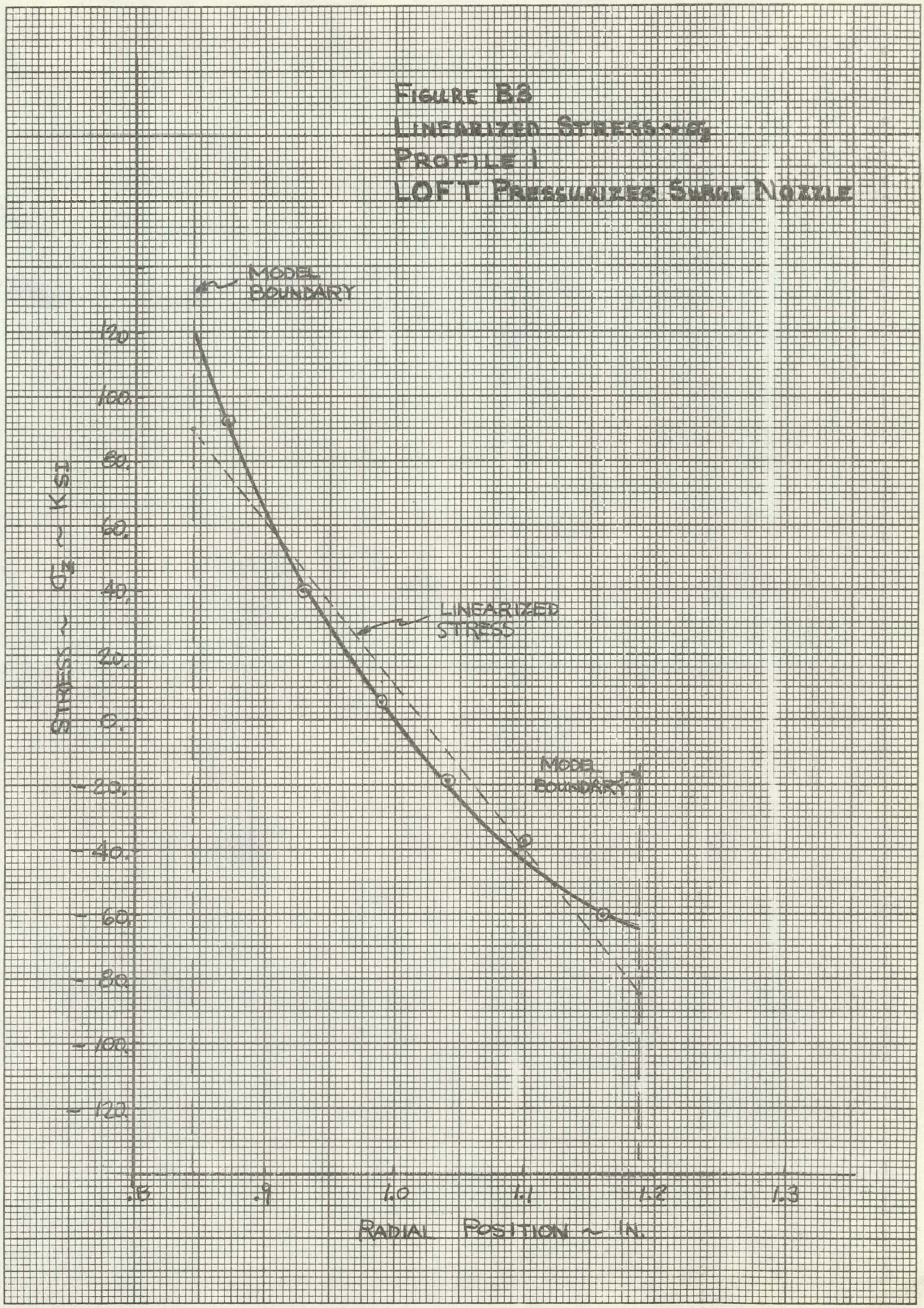


FIGURE B2.

LINEARIZED STRESS ~ σ_R
PROFILE 1
LOFT PRESSURIZER SURGE NOZZLE

FIGURE B8
LINEARIZED STRESS σ_{ij}
PROFILE 1
LOFT PRESSURIZER SURGE NOZZLE



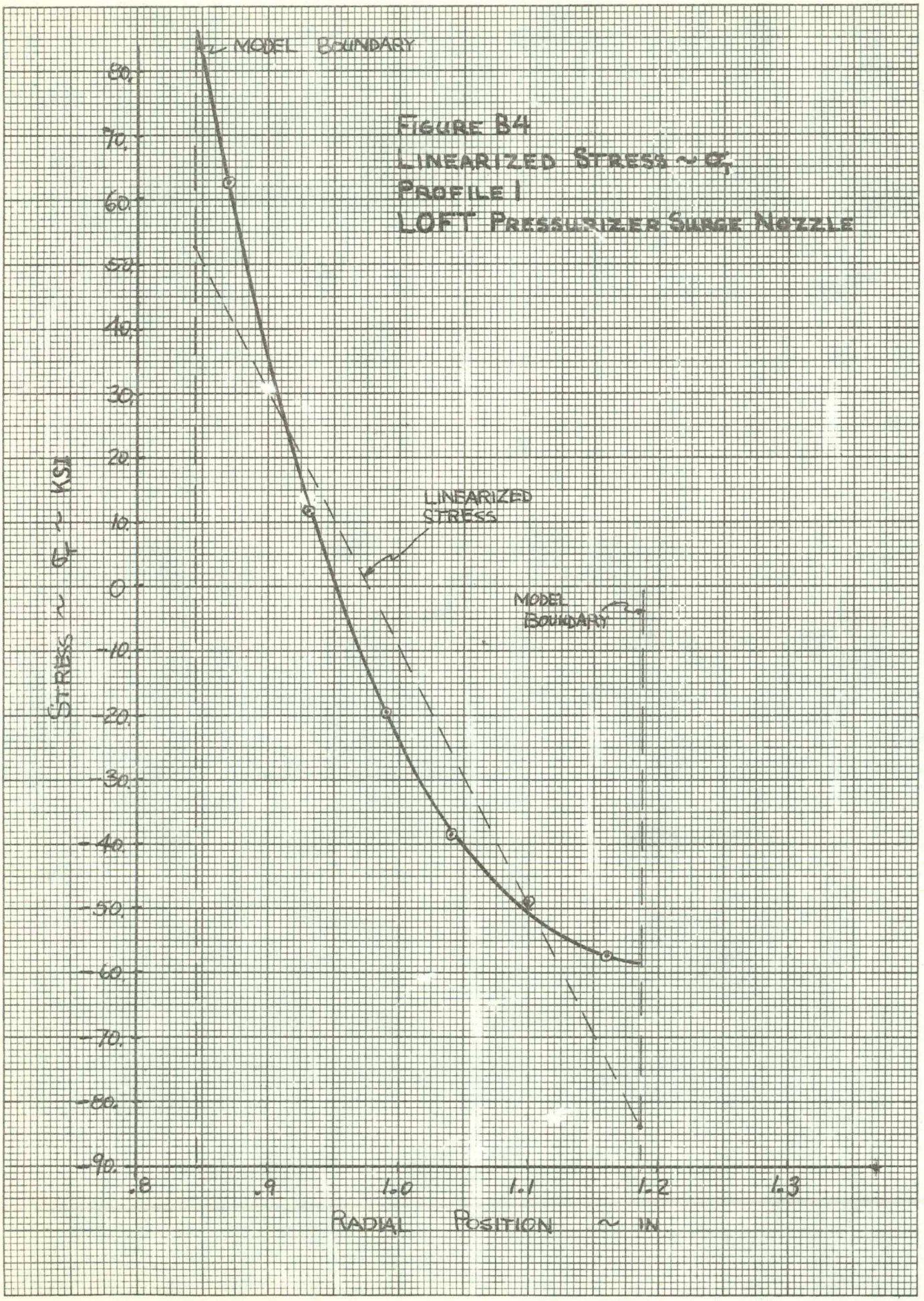


FIGURE B4
LINEARIZED STRESS ~ σ_t
PROFILE I
LOFT PRESSURIZER SURGE NOZZLE

FIGURE B5
LINEARIZED STRESS ~ T_{RZ}
PROFILE 1
LOFT PRESSURIZER SURGE NOZZLE

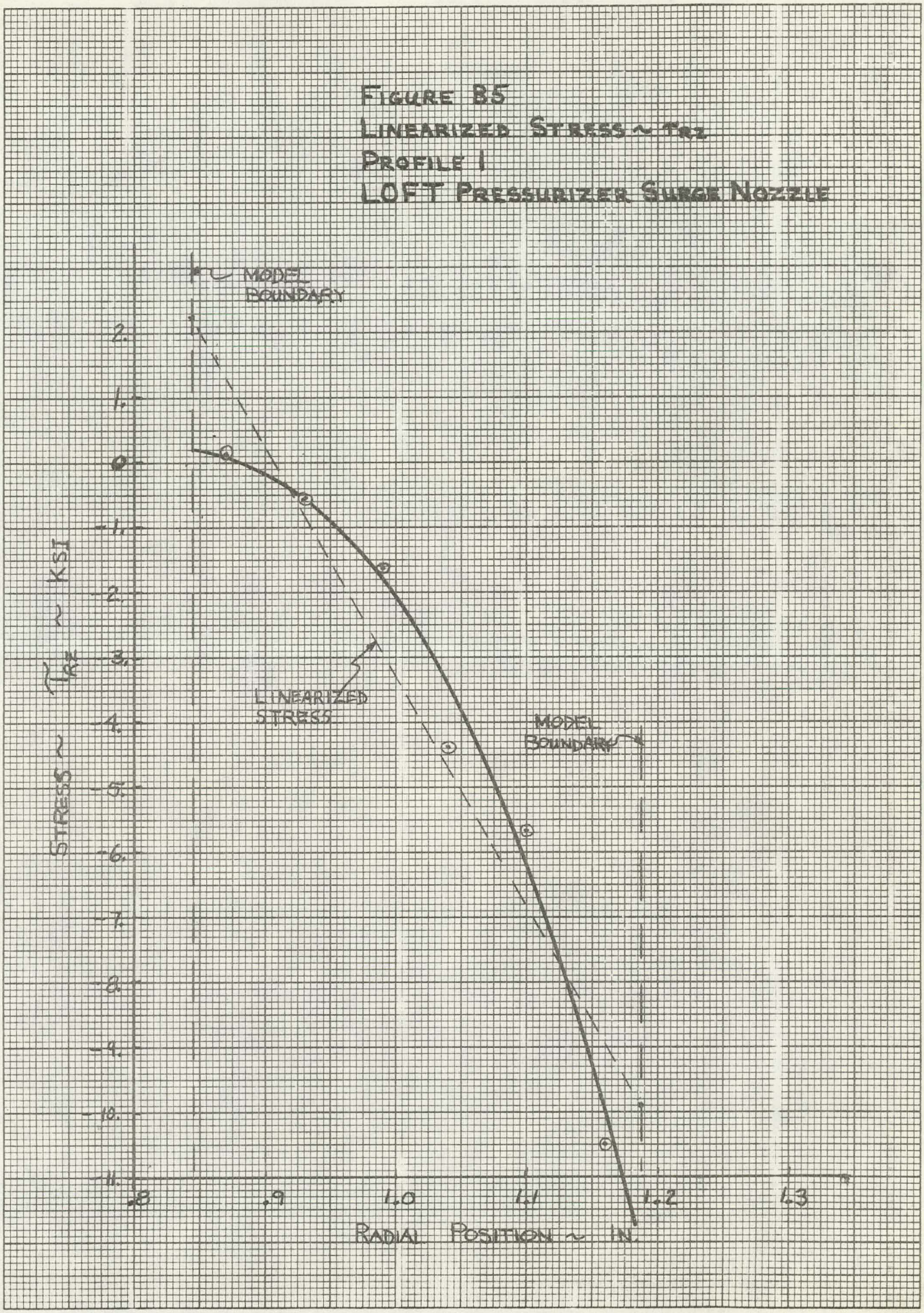
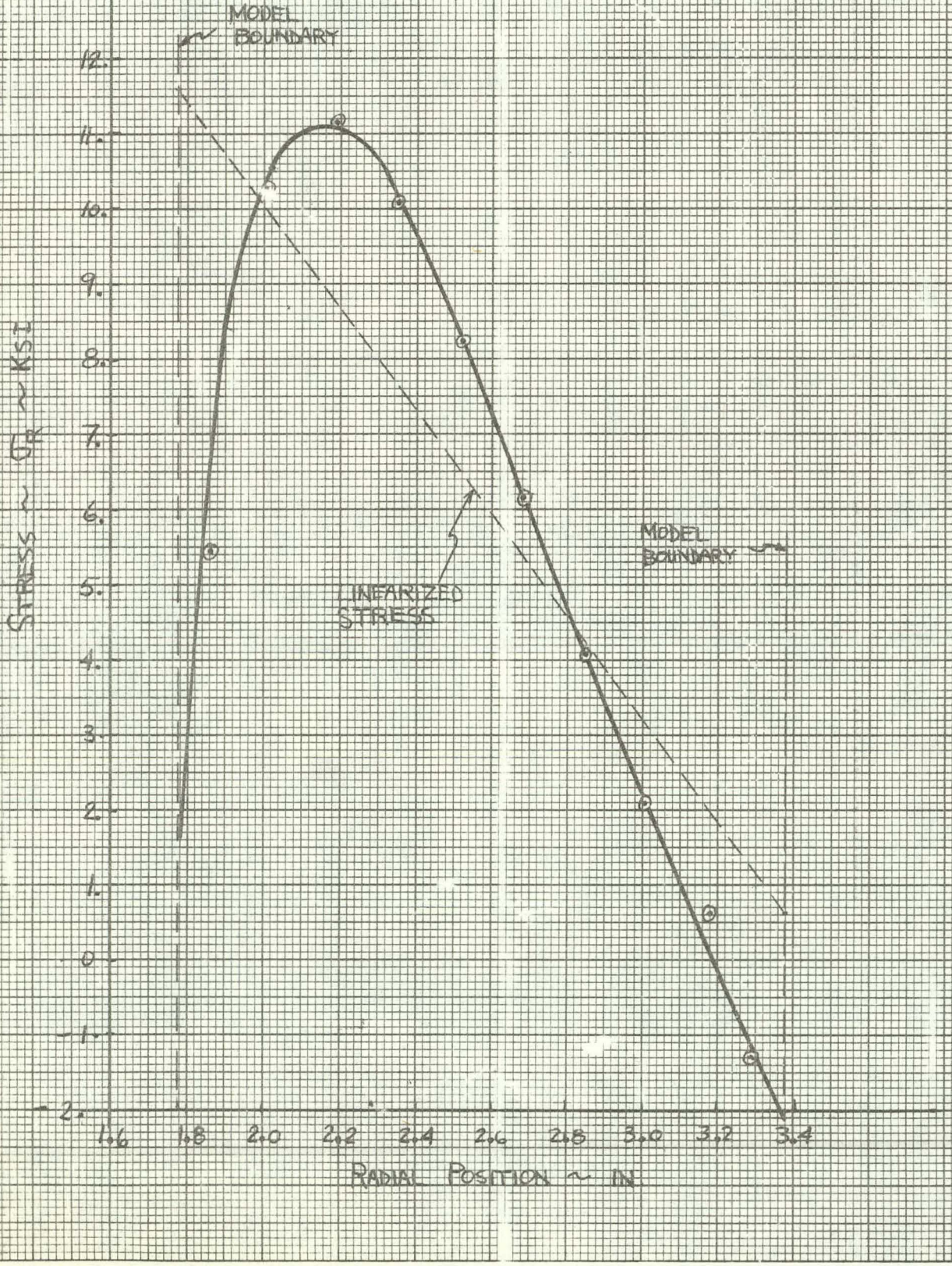


FIGURE B6
LINEARIZED STRESS ~ σ_R
PROFILE 2
LOFT PRESSURIZER SURGE NOZZLE



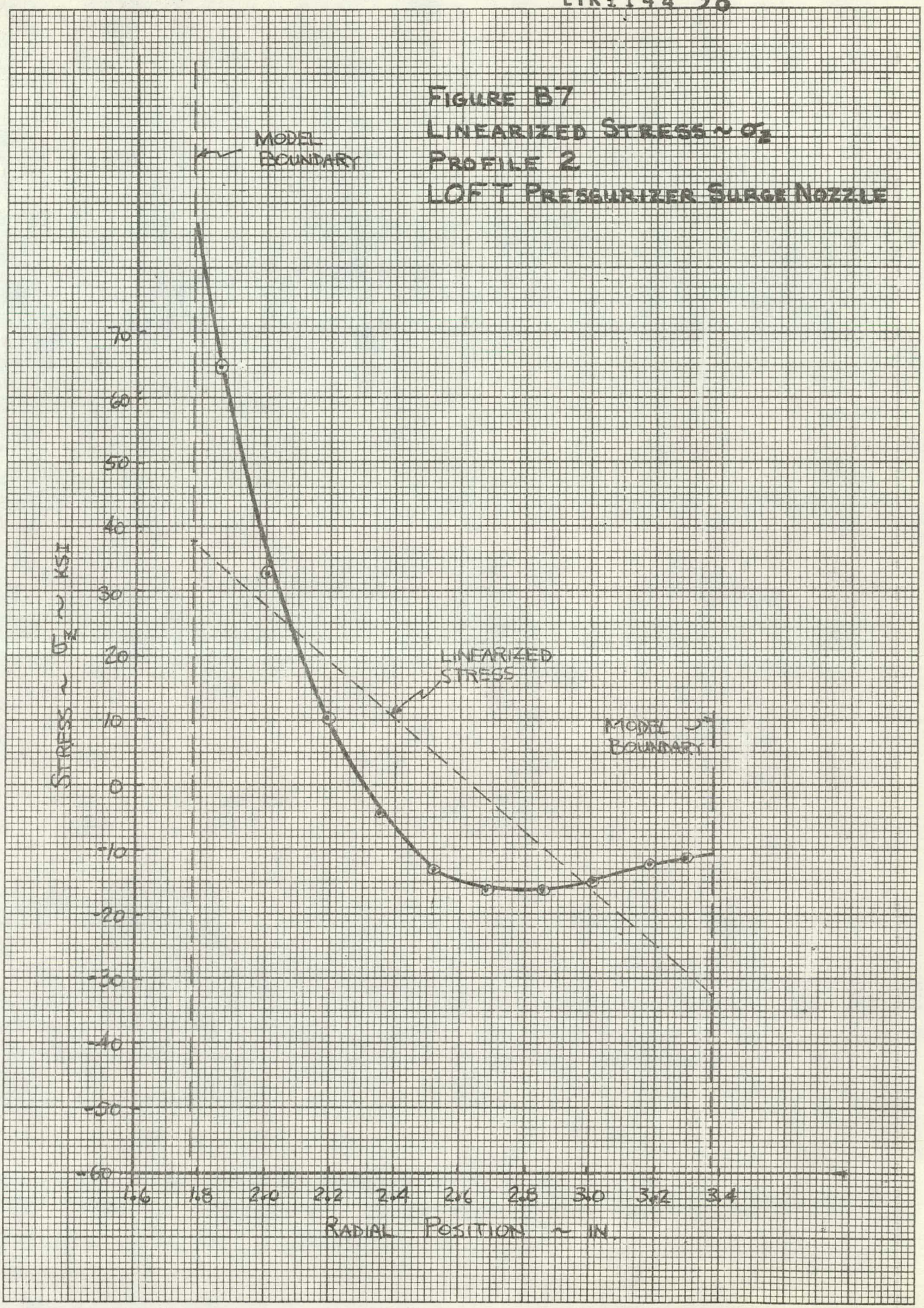


FIGURE B7
LINEARIZED STRESS ~ σ_x
PROFILE 2
LOFT PRESSURIZER SURGE NOZZLE

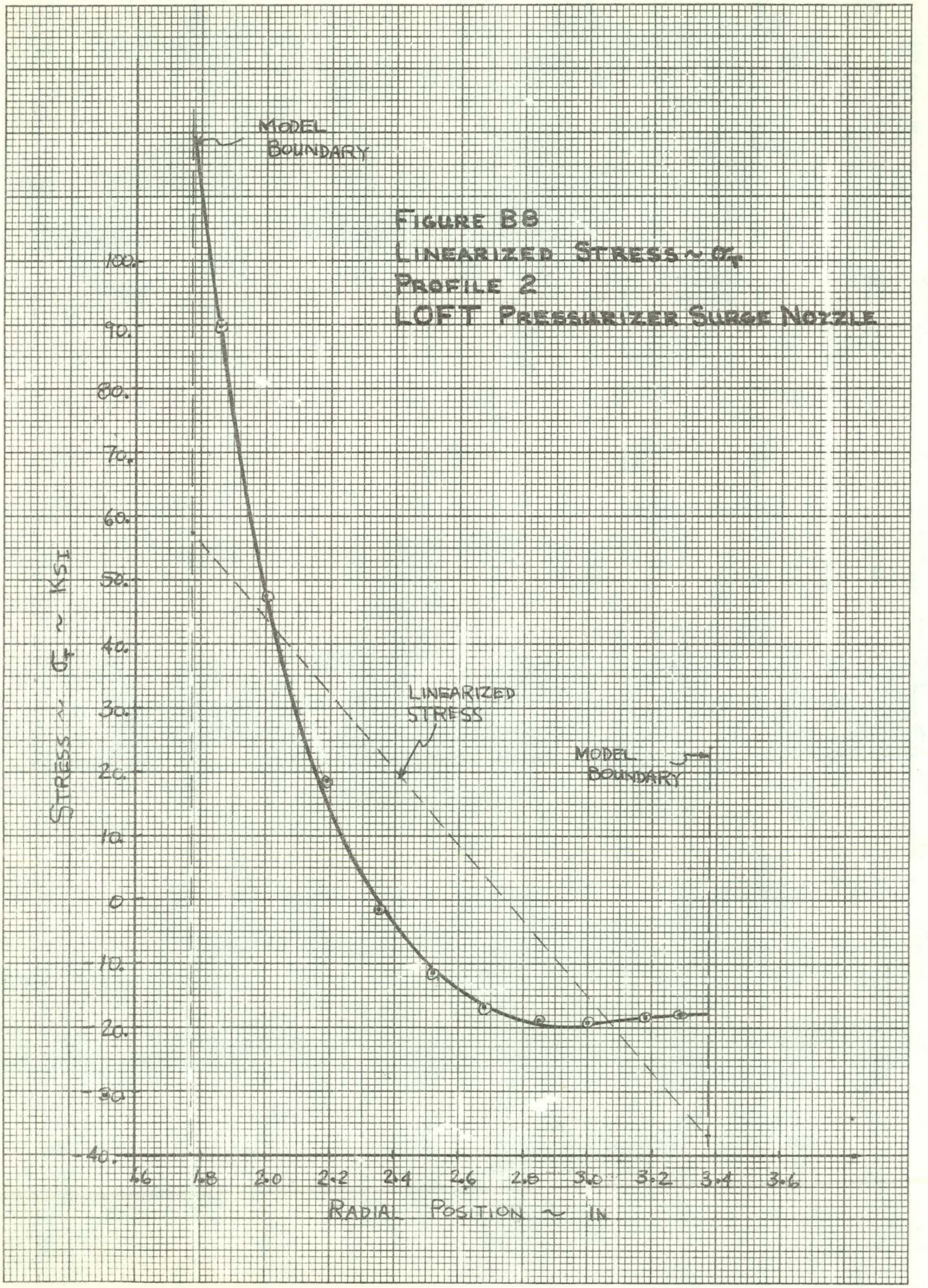


FIGURE B8
LINEARIZED STRESS ~ σ_t
PROFILE 2
LOFT PRESSURIZER SURGE NOZZLE

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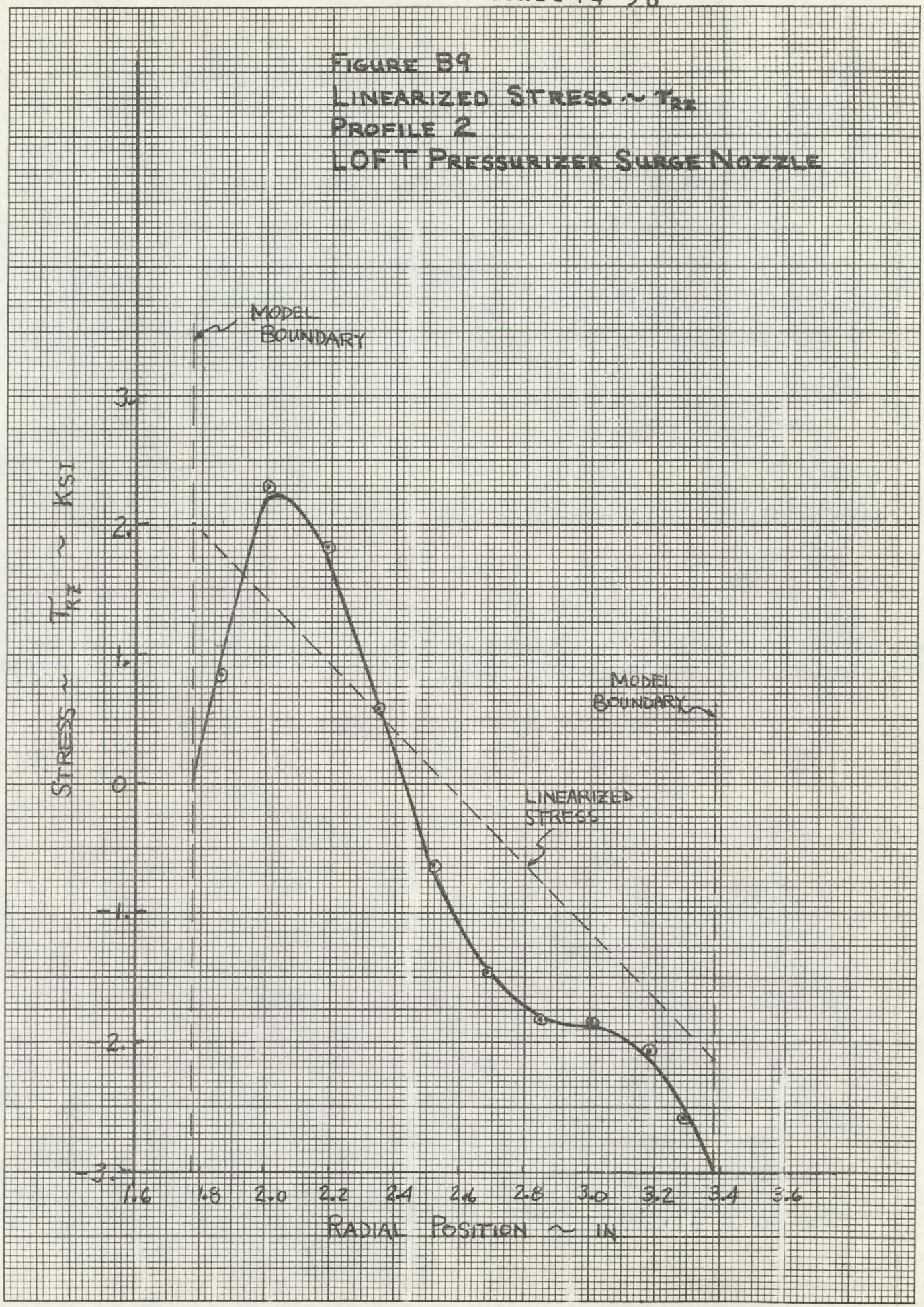
FIGURE B9
LINEARIZED STRESS ~ τ_{RZ}
PROFILE 2
LOFT PRESSURIZER SURGE NOZZLE



USING THE LINEARIZED COMPONENTS SHOWN IN THESE FIGURES AND THE TRIAXIAL STRESS EQUATION:

$$\sigma^3 - (\sigma_R + \sigma_Z + \sigma_T)\sigma^2 + (\sigma_R\sigma_Z + \sigma_Z\sigma_T + \sigma_R\sigma_T - \tau_{RZ}^2)\sigma - (\sigma_R\sigma_Z\sigma_T - \sigma_T\tau_{RZ}^2) = 0$$

THE PRINCIPAL STRESSES AND STRESS DIFFERENCES SHOWN BELOW ARE FOUND:

PROFILE 1, INSIDE:

$\sigma_1 = \sigma_{X_{BTI}} = 7.2$ KSI

$\sigma_2 = \sigma_{Y_{BTI}} = 89.1$ KSI

$\sigma_3 = \sigma_{H_{BTI}} = 56.0$ KSI

NOTE USE OF BTI'S SYSTEM

$S_{XY} = 7.2 - 89.1 = -81.9$ KSI

$S_{YH} = 89.1 - 56.0 = 33.1$ KSI

$S_{HX} = 56.0 - 7.2 = 48.8$ KSI

PROFILE 1, OUTSIDE

$\sigma_X = -6.6$ KSI

$\sigma_Y = -86.2$ KSI

$\sigma_H = -84.0$ KSI

$S_{XY} = -6.6 - (-86.2) = 79.6$ KSI

$S_{YH} = -86.2 - (-84.0) = -2.2$ KSI

$S_{HX} = -84.0 - (-6.6) = -77.4$ KSI

PROFILE 2, INSIDE

σ_x = 11.4 KSI

σ_y = 38.2 KSI

σ_H = 57.5 KSI

S_{xy} = 11.4 - 38.2 = -26.8 KSI

S_{yH} = 38.2 - 57.5 = -19.3 KSI

S_{Hx} = 57.5 - 11.4 = 46.1 KSI

PROFILE 2, OUTSIDE

σ_x = 0.7 KSI

σ_y = -32.6 KSI

σ_H = -37.0 KSI

S_{xy} = .7 - (-32.6) = 33.3 KSI

S_{yH} = -32.6 - (-37.0) = 4.4 KSI

S_{Hx} = -37.0 - .7 = -37.7 KSI

AS STATED IN THE BTI REPORT, MAXIMUM PRIMARY PLUS SECONDARY STRESS RANGES ARE AS FOLLOWS:

PROFILE 1, INSIDE : LOCE (20 SEC.) & S.S.F. (+6)

PROFILE 1, OUTSIDE : LOCE (20) & S.S.F. (36)

PROFILE 2, INSIDE: LOCE (20) & S.S.F. (36)

PROFILE 2, OUTSIDE: LOCE (25) & HOT LEAK

NOW, MUST CHECK TO SEE IF RANGE BETWEEN 450°F STEP TRANSIENT AND ANY OF THE ABOVE IS GREATER THAN MAXIMUMS CALCULATED BY BTI.

PROFILE 1, INSIDE, LOCE & 450°F STEP:

LOCE	S_{XY} = -45.2	S_{YH} = 22.6	S_{HX} = 22.6
-450°STEP	+81.9	-33.1	-48.8
	36.7	-10.5	-26.2

MAX S.I. RANGE = 36.7 KSI

PROFILE 1, INSIDE, S.S.F. (6) & 450° STEP:

SSF	S_{XY} = -1.7	S_{YH} = -5.7	S_{HX} = 7.4
-450°STEP	81.9	-33.1	-48.8
	80.2	-38.8	-41.4

MAX. S.I. RANGE = 80.2 KSI

PROFILE 1, OUTSIDE, LOCE & 450° STEP:

LOCE	S_{XY} = 47.9	S_{YH} = -6.6	S_{HX} = -41.3
-450°STEP	-79.6	2.2	77.4
	-31.7	-4.4	36.1

MAX. S.I. RANGE = 36.1

PROFILE 1, OUTSIDE, S.S.F. & 450° STEP:

SSF	S_{XY} = -5.5	S_{YH} = -1.7	S_{HX} = 7.2
-450°STEP	-79.6	2.2	77.4
	-85.1	0.5	84.6

MAX S.I. RANGE = 85.1 KSI

PROFILE 2, INSIDE, LOCE & 450° STEP:

LOCE	S_{XY} = -28.6	S_{YH} = 2.2	S_{HX} = 26.4
-450°STEP	26.8	19.3	-46.1
	-1.8	21.5	-19.7

MAX. S.I. RANGE = 21.5 KSI

PROFILE 2, INSIDE, S.S.F. & 450°STEP:

SSF	S_{xH} = 0.2	S_{yH} = 0.9	S_{Hx} = -1.1
450°STEP	26.8	19.3	-46.1
	27.0	20.2	-47.2

MAX. S.I. RANGE = 47.2 KSI

PROFILE 2, OUTSIDE, LOCE & 450°STEP

LOCE	S_{xH} = 22.7	S_{yH} = 7.3	S_{Hx} = -30.0
450°STEP	-33.3	-4.4	37.7
	10.6	2.9	7.7

MAX. S.I. RANGE = 10.6 KSI

PROFILE 2, OUTSIDE, HOT LEAK & 450°STEP

H.L.	S_{xH} = -4.3	S_{yH} = -1.9	S_{Hx} = 6.3
450°STEP	-33.3	-4.4	37.7
	-37.6	-6.3	44.0

MAX S.I. RANGE = 44.0 KSI

MATERIAL FOR BOTH PROFILES IS INCONEL (SB-167), THUS:

S_M = 16.6 KSI @ 650°F

$3S_M$ = 49.8 KSI

IT CAN BE SEEN IN THE PREVIOUS CALCULATIONS THAT THE $3S_M$ LIMIT ON PRIMARY PLUS SECONDARY STRESS INTENSITY HAS BEEN EXCEEDED IN TWO AREAS. THUS, A SIMPLIFIED ELASTIC-PLASTIC ANALYSIS PER NB-3228.3 WILL BE PERFORMED FOR THE TWO POINTS.

USING FIGURES B2-B5, THE STRESS COMPONENTS FOR PROFILE 1, EXCLUDING THERMAL BENDING, ARE:

σ_R = - .35 KSI
σ_Z = 2.50 KSI
σ_H = -15.50 KSI
τ_{RZ} = - 3.83 KSI

USING THES COMPONENTS IN THE TRIAXIAL STRESS EQUATION SHOWN ON PAGE B14 YIELDS THE FOLLOWING PRINCIPAL STRESSES:

$\sigma_1 = \sigma_x$ = - 3.01
$\sigma_2 = \sigma_y$ = 5.16
$\sigma_3 = \sigma_H$ = -15.50

STRESS DIFFERENCES ARE:

S_{xy} = -3.01 - 5.16 = -8.17

S_{yH} = 5.16 - (-15.50) = 20.66

S_{Hx} = -15.50 -(-3.01) = -12.49

PROFILE 1, INSIDE, S.S.F. & 450° STEP (MINUS T.B.)

S.S.F.	S_{xy} = - 1.7	S_{yH} = -5.7	S_{Hx} = 7.4
- 450° STEP	8.2	- 20.7	12.5
	6.5	- 26.4	19.9

MAX. S.I. = 26.4 KSI

PROFILE 1, OUTSIDE, S.S.F. & 450° STEP (MINUS T.B.)

S.S.F.	S_{xy} = - 5.5	S_{yH} = -1.7	S_{Hx} = 7.2
- 450° STEP	8.2	- 20.7	12.5
	2.7	- 22.4	19.7

MAX. SI. = 22.4 KSI

SO MAXIMUM RANGE OF PRIMARY + SECONDARY - THERMAL BENDING STRESS INTENSITY IS

26.4 KSI

26.4 < $3S_M$ (OR 49.8) KSI SO MAY PROCEED

S_n = RANGE OF PRIMARY + SECONDARY STEESS

USING MAXIMUM VALUE HAVE:

$$S_n = 85.1 \text{ KSI}$$

FOR INCONEL SB-167:

$$m = 1.7$$
$$n = .3$$

$$3m S_m = 3.0(1.7)(16.6) = 84.7 \text{ KSI}$$

$$S_n > 3m S_m$$

16.

$$85.1 > 84.7$$

THUS:

$$K_e = 1/n$$
$$= 1/.3$$
$$K_e = 3.33$$

THUS, MUST MULTIPLY S_A VALUE FOR STEADY STATE FLUCTUATIONS AND 450°F STEP TRANSIENT PAIRING IN FATIGUE CALCULATIONS BY K_e IF THIS PAIRING ENTERS INTO CUMULATIVE USAGE CALCULATIONS.

FATIGUE ANALYSIS

THE FATIGUE ANALYSIS WAS PERFORMED IN ACCORDANCE WITH SUBPARAGRAPH NB-3222.4 OF THE ASME CODE. THE PEAK STRESSES USED IN THESE CALCULATIONS WERE AS LISTED IN THE FATIGUE ANALYSIS SHOWN IN THE BTI REPORT WITH THE EXCEPTION OF THE 450°F STEP TRANSIENT. PEAK STRESS VALUES FOR THE 450°F STEP TRANSIENT WERE TAKEN FROM FIGURES B2 - B9 FOR PROFILES 1 AND 2.

THE TRANSIENT LOADS ANALYZED WERE:

1. OBE
2. LOCE (MECH.)
3. 450°F STEP
4. LOCE (20 SEC.)
5. LOCE (25 SEC.)
6. LOCE (55 SEC.)
7. LOCE (195 SEC.)
8. STEADY STATE FLUCTUATIONS (S.S.F.) (-, 6 SEC)
9. S.S.F. (- 36 SEC.)
10. S.S.F. (+6 SEC.)
11. S.S.F. (+36 SEC.)
12. PLANT LDG. (4 SEC.)
13. PLANT LDG. (48 SEC.)
14. HEAT-UP (3.3 HR.)
15. HEAT-UP (5.8 HR)
16. COOL DOWN (1.06 HR)
17. LEAK TEST
18. HOT LEAK
19. O.T.P.

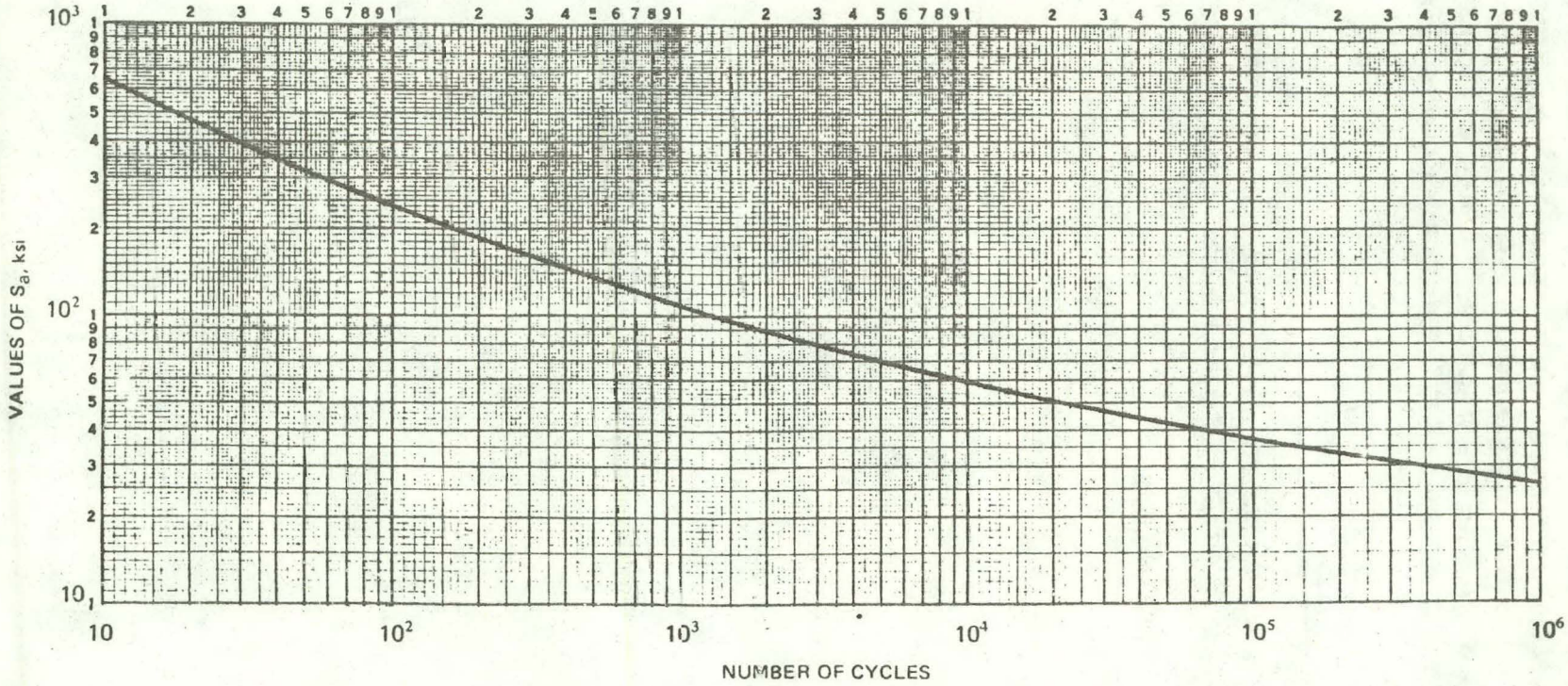
THE APPLIED MECHANICS BRANCH COMPUTER PROGRAM INTENS WAS USED TO CALCULATE ALTERNATING STRESS INTENSITIES FOR ALL POSSIBLE PAIRINGS OF TRANSIENT LOADS FOR BOTH AREAS OF INTEREST IN THE MODEL. THE FINAL TABLE OF OUTPUT FROM THIS PROGRAM LISTS ALTERNATING STRESS INTENSITIES IN DECREASING ORDER SUCH THAT THE APPROPRIATE FATIGUE LIFE CURVE MAY BE USED TO CALCULATE ALLOWABLE NUMBERS OF CYCLES AND THE CUMULATIVE USAGE FACTOR. FIGURE I-9.2 AS SHOWN ON PAGE 159 OF SUBSECTION NA OF THE 1974 EDITION OF THE ASME CODE WAS USED TO DETERMINE ALLOWABLE NUMBERS OF CYCLES. THIS CURVE IS REPRODUCED IN FIGURE B10, PAGE B22. A COMPLETE FORTRAN LISTING OF THE INTENS PROGRAM IS SHOWN IN APPENDIX D.

THE INTENS COMPUTER RUNS FOR BOTH AREAS OF INTEREST SHOWED THAT MAXIMUM ALTERNATING STRESS INTENSITY OCCURRED IN PROFILE 2 (THE AREA OF THE BI-METALLIC WELD) WHEN A STRESS CONCENTRATION FACTOR OF 2.0, AS ALLOWED BY SUBPARAGRAPH NB-3352.2, WAS USED. THUS, ONLY PROFILE 2 FATIGUE CALCULATIONS ARE INCLUDED IN THIS APPENDIX.

THE INTENS COMPUTER OUTPUT FOR PROFILE 2 IS SHOWN ON PAGES B23-B44. THE CUMULATIVE USAGE CALCULATIONS ARE SHOWN ON PAGES B40 AND B41. AS CAN BE SEEN ON PAGE B41, THE CUMULATIVE USAGE FACTOR WAS 0.6095. THIS VALUE IS UNDER THE USAGE FACTOR LIMIT OF 1.0.

UPSET CONDITIONS

AS EXPRESSED IN PARAGRAPH NB-3223, UPSET CONDITIONS ARE ANALYZED AS NORMAL CONDITIONS.



NOTE:
E = 26.0 X 10⁶ psi

FIGURE B10

DESIGN FATIGUE CURVE FOR AUSTENITIC STEELS, NICKEL-CHROMIUM-IRON ALLOY, NICKEL-IRON-CHROMIUM ALLOY AND NICKEL-COPPER ALLOY

LTR 1144 38

* * PROGRAM - - INTENS - - CALCULATION OF TRANSIENT STRESS INTENSITIES * *

NO. OF PROBLEMS OR POINTS TO BE ANALYZED IS 1

PROBLEM NO. 1
NO. OF TRANSIENTS 19
STRESS CONCENTRATION FACTOR = 2.000
ELASTIC MODULUS RATIO = 0.900

* * TRANSIENT STRESS DATA * *

* * NOTE THAT STRESSES ARE IN KSI * *

TRANS	NO. CYCLES	SIGMA X	SIGMA Y	SIGMA Z	TAU XY	TAU XZ	TAU YZ
1	100	0.0	-0.024	0.0	0.0	0.0	0.0
2	2600	0.0	-0.056	0.0	0.0	0.0	0.0
3	500	11.150	87.000	119.000	2.600	0.0	0.0
4	260	3.308	84.329	93.387	7.106	0.0	0.0
5	260	0.707	54.302	62.665	5.815	0.0	0.0
6	260	1.878	20.018	28.294	1.326	0.0	0.0
7	260	1.582	12.958	18.051	1.106	0.0	0.0
8	1000000	5.583	5.300	5.919	-0.961	0.0	0.0
9	1000000	4.864	7.834	10.901	-0.982	0.0	0.0
10	1000000	5.293	0.075	1.297	-1.102	0.0	0.0
11	1000000	6.011	-2.459	-3.687	-1.081	0.0	0.0
12	11000	5.784	6.347	8.460	-0.730	0.0	0.0
13	11000	4.605	12.154	17.195	-0.798	0.0	0.0
14	1500	-0.467	5.432	7.075	0.539	0.0	0.0
15	1500	3.504	6.469	8.571	-0.984	0.0	0.0
16	1500	2.987	5.914	6.543	0.648	0.0	0.0
17	260	1.740	3.368	6.667	-2.432	0.0	0.0
18	260	5.754	3.300	4.820	-1.474	0.0	0.0
19	1000000	5.438	2.688	3.607	-1.032	0.0	0.0

* * STRESS COMPONENT RANGES - NOTE THAT A TRANSIENT NUMBER OF ZERO IMPLIES NULL CONDITIONS * *

* * THESE VALUES FOUND BY SUBTRACTING COMPONENTS OF THE TRANSIENT PAIRS

* * NOTE THAT IF AXISYMMETRIC STRESS DATA IS USED-SUCH AS SAAS3 OUTPUT-STRESS COLUMNS X,Y,Z, AND XY CORRESPOND TO R,Z,T, AND RZ STRESSES, RESPECTIVELY

TRAN.	PAIR	SIG X	SIG Y	SIG Z	TAU XY	TAU XZ	TAU YZ
1	0	0.0	-0.024	0.0	0.0	0.0	0.0
2	0	0.0	-0.056	0.0	0.0	0.0	0.0
3	0	11.150	87.000	119.000	2.600	0.0	0.0
4	0	3.308	84.329	93.387	7.106	0.0	0.0
5	0	0.707	54.302	62.665	5.815	0.0	0.0
6	0	1.878	20.018	28.294	1.326	0.0	0.0
7	0	1.582	12.958	18.051	1.106	0.0	0.0
8	0	5.583	5.300	5.919	-0.961	0.0	0.0
9	0	4.864	7.834	10.901	-0.982	0.0	0.0
10	0	5.293	0.075	1.297	-1.102	0.0	0.0
11	0	6.011	-2.459	-3.687	-1.081	0.0	0.0
12	0	5.784	6.347	8.460	-0.730	0.0	0.0
13	0	4.605	12.154	17.195	-0.798	0.0	0.0
14	0	-0.467	5.432	7.075	0.539	0.0	0.0
15	0	3.504	6.469	8.571	-0.984	0.0	0.0
16	0	2.987	5.914	6.543	0.648	0.0	0.0
17	0	1.740	3.368	6.667	-2.432	0.0	0.0
18	0	5.754	3.300	4.820	-1.474	0.0	0.0
19	0	5.438	2.688	3.607	-1.032	0.0	0.0
1	2	0.0	0.032	0.0	0.0	0.0	0.0
1	3	-11.150	-87.024	-119.000	-2.600	0.0	0.0
1	4	-3.308	-84.353	-93.387	-7.106	0.0	0.0
1	5	-0.707	-54.326	-62.665	-5.815	0.0	0.0
1	6	-1.878	-20.042	-28.294	-1.326	0.0	0.0
1	7	-1.582	-12.982	-18.051	-1.106	0.0	0.0
1	8	-5.583	-5.324	-5.919	0.961	0.0	0.0
1	9	-4.864	-7.858	-10.901	0.982	0.0	0.0
1	10	-5.293	-0.099	-1.297	1.102	0.0	0.0
1	11	-6.011	2.435	3.687	1.081	0.0	0.0
1	12	-5.784	-6.371	-8.460	0.730	0.0	0.0
1	13	-4.605	-12.178	-17.195	0.798	0.0	0.0
1	14	0.467	-5.456	-7.075	-0.539	0.0	0.0
1	15	-3.504	-6.493	-8.571	0.984	0.0	0.0
1	16	-2.987	-5.938	-6.543	-0.648	0.0	0.0
1	17	-1.740	-3.392	-6.667	2.432	0.0	0.0
1	18	-5.754	-3.324	-4.820	1.474	0.0	0.0
1	19	-5.438	-2.712	-3.607	1.032	0.0	0.0
2	3	-11.150	-87.056	-119.000	-2.600	0.0	0.0
2	4	-3.308	-84.385	-93.387	-7.106	0.0	0.0
2	5	-0.707	-54.358	-62.665	-5.815	0.0	0.0
2	6	-1.878	-20.074	-28.294	-1.326	0.0	0.0
2	7	-1.582	-13.014	-18.051	-1.106	0.0	0.0
2	8	-5.583	-5.356	-5.919	0.961	0.0	0.0
2	9	-4.864	-7.890	-10.901	0.982	0.0	0.0
2	10	-5.293	-0.131	-1.297	1.102	0.0	0.0
2	11	-6.011	2.403	3.687	1.081	0.0	0.0

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* * NOTE THAT IF AXISYMMETRIC STRESS DATA IS USED-SUCH AS SAAS3 OUTPUT-STRESS COLUMNS X,Y,Z, AND XY CORRESPOND TO R,Z,T, AND RZ STRESSES, RESPECTIVELY

TRAN.	PAIR	SIG X	SIG Y	SIG Z	TAU XY	TAU XZ	TAU YZ
2	12	-5.784	-6.403	-8.460	0.730	0.0	0.0
2	13	-4.605	-12.210	-17.195	0.798	0.0	0.0
2	14	0.467	-5.488	-7.075	-0.539	0.0	0.0
2	15	-3.504	-6.525	-8.571	0.984	0.0	0.0
2	16	-2.987	-5.970	-6.543	-0.648	0.0	0.0
2	17	-1.740	-3.424	-6.667	2.432	0.0	0.0
2	18	-5.754	-3.356	-4.820	1.474	0.0	0.0
2	19	-5.438	-2.744	-3.607	1.032	0.0	0.0
3	4	7.842	2.671	25.613	-4.506	0.0	0.0
3	5	10.443	32.698	56.335	-3.215	0.0	0.0
3	6	9.272	66.982	90.706	1.274	0.0	0.0
3	7	9.568	74.042	100.949	1.494	0.0	0.0
3	8	5.567	81.700	113.081	3.561	0.0	0.0
3	9	6.286	79.166	108.099	3.582	0.0	0.0
3	10	5.857	86.925	117.703	3.702	0.0	0.0
3	11	5.139	89.459	122.687	3.681	0.0	0.0
3	12	5.366	80.653	110.540	3.330	0.0	0.0
3	13	6.545	74.846	101.805	3.398	0.0	0.0
3	14	11.617	81.568	111.925	2.061	0.0	0.0
3	15	7.646	80.531	110.429	3.584	0.0	0.0
3	16	8.163	81.086	112.457	1.952	0.0	0.0
3	17	9.410	83.632	112.333	5.032	0.0	0.0
3	18	5.396	83.700	114.180	4.074	0.0	0.0
3	19	5.712	84.312	115.393	3.632	0.0	0.0
4	5	2.601	30.027	30.722	1.291	0.0	0.0
4	6	1.430	64.311	65.093	5.780	0.0	0.0
4	7	1.726	71.371	75.336	6.000	0.0	0.0
4	8	-2.275	79.029	87.468	8.067	0.0	0.0
4	9	-1.556	76.495	82.486	8.088	0.0	0.0
4	10	-1.985	84.254	92.090	8.208	0.0	0.0
4	11	-2.703	86.788	97.074	8.187	0.0	0.0
4	12	-2.476	77.982	84.927	7.836	0.0	0.0
4	13	-1.297	72.175	76.192	7.904	0.0	0.0
4	14	3.775	78.897	86.312	6.567	0.0	0.0
4	15	-0.196	77.860	84.816	8.090	0.0	0.0
4	16	0.321	78.415	86.844	6.458	0.0	0.0
4	17	1.568	80.961	86.720	9.538	0.0	0.0
4	18	-2.446	81.029	88.567	8.580	0.0	0.0
4	19	-2.130	81.641	89.780	8.138	0.0	0.0
5	6	-1.171	34.284	34.371	4.489	0.0	0.0
5	7	-0.875	41.344	44.614	4.709	0.0	0.0
5	8	-4.876	49.002	56.746	6.776	0.0	0.0
5	9	-4.157	46.468	51.764	6.797	0.0	0.0
5	10	-4.586	54.227	61.368	6.917	0.0	0.0
5	11	-5.304	56.761	66.352	6.896	0.0	0.0
5	12	-5.077	47.955	54.205	6.545	0.0	0.0

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* * NOTE THAT IF AXISYMMETRIC STRESS DATA IS USED-SUCH AS SAAS3 OUTPUT-STRESS COLUMNS X,Y,Z, AND XY CORRESPOND TO R,Z,T, AND RZ STRESSES, RESPECTIVELY

TRAN.	PAIR	SIG X	SIG Y	SIG Z	TAU XY	TAU XZ	TAU YZ
5	13	-3.898	42.148	45.470	6.613	0.0	0.0
5	14	1.174	48.870	55.590	5.276	0.0	0.0
5	15	-2.797	47.833	54.094	6.799	0.0	0.0
5	16	-2.280	48.388	56.122	5.167	0.0	0.0
5	17	-1.033	50.934	55.998	8.247	0.0	0.0
5	18	-5.047	51.002	57.845	7.289	0.0	0.0
5	19	-4.731	51.614	59.058	6.847	0.0	0.0
6	7	0.296	7.060	10.243	0.220	0.0	0.0
6	8	-3.705	14.718	22.375	2.287	0.0	0.0
6	9	-2.986	12.184	17.393	2.308	0.0	0.0
6	10	-3.415	19.943	26.997	2.428	0.0	0.0
6	11	-4.133	22.477	31.981	2.407	0.0	0.0
6	12	-3.906	13.671	19.834	2.056	0.0	0.0
6	13	-2.727	7.864	11.099	2.124	0.0	0.0
6	14	2.345	14.586	21.219	0.787	0.0	0.0
6	15	-1.626	13.549	19.723	2.310	0.0	0.0
6	16	-1.109	14.104	21.751	0.678	0.0	0.0
6	17	0.138	16.650	21.627	3.758	0.0	0.0
6	18	-3.876	16.718	23.474	2.800	0.0	0.0
6	19	-3.560	17.330	24.687	2.358	0.0	0.0
7	8	-4.001	7.658	12.132	2.067	0.0	0.0
7	9	-3.282	5.124	7.150	2.088	0.0	0.0
7	10	-3.711	12.883	16.754	2.208	0.0	0.0
7	11	-4.429	15.417	21.738	2.187	0.0	0.0
7	12	-4.202	6.611	9.591	1.836	0.0	0.0
7	13	-3.023	0.804	0.856	1.904	0.0	0.0
7	14	2.049	7.526	10.976	0.567	0.0	0.0
7	15	-1.922	6.489	9.480	2.090	0.0	0.0
7	16	-1.405	7.044	11.508	0.458	0.0	0.0
7	17	-0.158	9.590	11.384	3.538	0.0	0.0
7	18	-4.172	9.658	13.231	2.580	0.0	0.0
7	19	-3.856	10.270	14.444	2.138	0.0	0.0
8	9	0.719	-2.534	-4.982	0.021	0.0	0.0
8	10	0.290	5.225	4.622	0.141	0.0	0.0
8	11	-0.428	7.759	9.606	0.120	0.0	0.0
8	12	-0.201	-1.047	-2.541	-0.231	0.0	0.0
8	13	0.978	-6.854	-11.276	-0.163	0.0	0.0
8	14	6.050	-0.132	-1.156	-1.500	0.0	0.0
8	15	2.079	-1.169	-2.652	0.023	0.0	0.0
8	16	2.596	-0.614	-0.624	-1.609	0.0	0.0
8	17	3.843	1.932	-0.748	1.471	0.0	0.0
8	18	-0.171	2.000	1.099	0.513	0.0	0.0
8	19	0.145	2.612	2.312	0.071	0.0	0.0
9	10	-0.429	7.759	9.604	0.120	0.0	0.0
9	11	-1.147	10.293	14.588	0.099	0.0	0.0
9	12	-0.920	1.487	2.441	-0.252	0.0	0.0

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* * NOTE THAT IF AXISYMMETRIC STRESS DATA IS USED-SUCH AS SAAS3 OUTPUT-STRESS COLUMNS X,Y,Z, AND XY CORRESPOND TO R,Z,T, AND RZ STRESSES, RESPECTIVELY

TRAN.	PAIR	SIG X	SIG Y	SIG Z	TAU XY	TAU XZ	TAU YZ
9	13	0.259	-4.320	-6.294	-0.184	0.0	0.0
9	14	5.331	2.402	3.826	-1.521	0.0	0.0
9	15	1.360	1.365	2.330	0.002	0.0	0.0
9	16	1.877	1.920	4.358	-1.630	0.0	0.0
9	17	3.124	4.466	4.234	1.450	0.0	0.0
9	18	-0.890	4.534	6.081	0.492	0.0	0.0
9	19	-0.574	5.146	7.294	0.050	0.0	0.0
10	11	-0.718	2.534	4.984	-0.021	0.0	0.0
10	12	-0.491	-6.272	-7.163	-0.372	0.0	0.0
10	13	0.688	-12.079	-15.898	-0.304	0.0	0.0
10	14	5.760	-5.357	-5.778	-1.641	0.0	0.0
10	15	1.789	-6.394	-7.274	-0.118	0.0	0.0
10	16	2.306	-5.839	-5.246	-1.750	0.0	0.0
10	17	3.553	-3.293	-5.370	1.330	0.0	0.0
10	18	-0.461	-3.225	-3.523	0.372	0.0	0.0
10	19	-0.145	-2.613	-2.310	-0.070	0.0	0.0
11	12	0.227	-8.806	-12.147	-0.351	0.0	0.0
11	13	1.406	-14.613	-20.882	-0.283	0.0	0.0
11	14	6.478	-7.891	-10.762	-1.620	0.0	0.0
11	15	2.507	-8.928	-12.258	-0.097	0.0	0.0
11	16	3.024	-8.373	-10.230	-1.729	0.0	0.0
11	17	4.271	-5.827	-10.354	1.351	0.0	0.0
11	18	0.257	-5.759	-8.507	0.393	0.0	0.0
11	19	0.573	-5.147	-7.294	-0.049	0.0	0.0
12	13	1.179	-5.807	-8.735	0.068	0.0	0.0
12	14	6.251	0.915	1.385	-1.269	0.0	0.0
12	15	2.280	-0.122	-0.111	0.254	0.0	0.0
12	16	2.797	0.433	1.917	-1.378	0.0	0.0
12	17	4.044	2.979	1.793	1.702	0.0	0.0
12	18	0.030	3.047	3.640	0.744	0.0	0.0
12	19	0.346	3.659	4.853	0.302	0.0	0.0
13	14	5.072	6.722	10.120	-1.337	0.0	0.0
13	15	1.101	5.685	8.624	0.186	0.0	0.0
13	16	1.618	6.240	10.652	-1.446	0.0	0.0
13	17	2.865	8.786	10.528	1.634	0.0	0.0
13	18	-1.149	8.854	12.375	0.676	0.0	0.0
13	19	-0.833	9.466	13.588	0.234	0.0	0.0
14	15	-3.971	-1.037	-1.496	1.523	0.0	0.0
14	16	-3.454	-0.482	0.532	-0.109	0.0	0.0
14	17	-2.207	2.064	0.408	2.971	0.0	0.0
14	18	-6.221	2.132	2.255	2.013	0.0	0.0
14	19	-5.905	2.744	3.468	1.571	0.0	0.0
15	16	0.517	0.555	2.028	-1.632	0.0	0.0
15	17	1.764	3.101	1.904	1.448	0.0	0.0
15	18	-2.250	3.169	3.751	0.490	0.0	0.0
15	19	-1.934	3.781	4.964	0.048	0.0	0.0

* * STRESS COMPONENT RANGES - NOTE THAT A TRANSIENT NUMBER OF ZERO IMPLIES NULL CONDITIONS * *

* * THESE VALUES FOUND BY SUBTRACTING COMPONENTS OF THE TRANSIENT PAIRS

* * NOTE THAT IF AXISYMMETRIC STRESS DATA IS USED-SUCH AS SAAS3 OUTPUT-STRESS COLUMNS X,Y,Z, AND XY CORRESPOND TO R,Z,T, AND RZ STRESSES, RESPECTIVELY

TRAN.	PAIR	SIG X	SIG Y	SIG Z	TAU XY	TAU XZ	TAU YZ
16	17	1.247	2.546	-0.124	3.080	0.0	0.0
16	18	-2.767	2.614	1.723	2.122	0.0	0.0
16	19	-2.451	3.226	2.936	1.680	0.0	0.0
17	18	-4.014	0.068	1.847	-0.958	0.0	0.0
17	19	-3.698	0.680	3.060	-1.400	0.0	0.0
18	19	0.316	0.612	1.213	-0.442	0.0	0.0

* * COEFICIENTS FOR TRIAXIAL STRESS EQUATION - CORRELATE COLUMN HEADINGS TO FORM AX**3+BX**2+CX+D=0

TRAN.	PAIR	A	B	C	D
1	0	1.000	0.2400D-01	0.0	0.0
2	0	1.000	0.5600D-01	0.0	0.0
3	0	1.000	-0.2172D 03	0.1264D 05	-0.1146D 06
4	0	1.000	-0.1810D 03	0.8413D 04	-0.2134D 05
5	0	1.000	-0.1177D 03	0.3452D 04	-0.2868D 03
6	0	1.000	-0.5019D 02	0.6554D 03	-0.1014D 04
7	0	1.000	-0.3259D 02	0.2817D 03	-0.3480D 03
8	0	1.000	-0.1680D 02	0.9308D 02	-0.1697D 03
9	0	1.000	-0.2360D 02	0.1756D 03	-0.4049D 03
10	0	1.000	-0.6665D 01	0.6145D 01	0.1060D 01
11	0	1.000	0.1350D 00	-0.2905D 02	-0.5881D 02
12	0	1.000	-0.2059D 02	0.1388D 03	-0.3061D 03
13	0	1.000	-0.3395D 02	0.3435D 03	-0.9514D 03
14	0	1.000	-0.1204D 02	0.3230D 02	0.2000D 02
15	0	1.000	-0.1854D 02	0.1072D 03	-0.1860D 03
16	0	1.000	-0.1544D 02	0.7548D 02	-0.1128D 03
17	0	1.000	-0.1178D 02	0.3400D 02	0.3620D 00
18	0	1.000	-0.1387D 02	0.6046D 02	-0.8105D 02
19	0	1.000	-0.1173D 02	0.4286D 02	-0.4888D 02
1	2	1.000	-0.3200D-01	0.0	0.0
1	3	1.000	0.2172D 03	0.1265D 05	0.1147D 06
1	4	1.000	0.1810D 03	0.8415D 04	0.2134D 05
1	5	1.000	0.1177D 03	0.3453D 04	0.2879D 03
1	6	1.000	0.5021D 02	0.6561D 03	0.1015D 04
1	7	1.000	0.3262D 02	0.2822D 03	0.3486D 03
1	8	1.000	0.1683D 02	0.9336D 02	0.1705D 03
1	9	1.000	0.2362D 02	0.1759D 03	0.4061D 03
1	10	1.000	0.6689D 01	0.6303D 01	-0.8954D 00
1	11	1.000	-0.1110D 00	-0.2899D 02	0.5827D 02
1	12	1.000	0.2062D 02	0.1391D 03	0.3072D 03
1	13	1.000	0.3398D 02	0.3440D 03	0.9533D 03
1	14	1.000	0.1206D 02	0.3246D 02	-0.2008D 02
1	15	1.000	0.1857D 02	0.1075D 03	0.1867D 03
1	16	1.000	0.1547D 02	0.7571D 02	0.1133D 03
1	17	1.000	0.1180D 02	0.3420D 02	-0.8363D-01
1	18	1.000	0.1390D 02	0.6071D 02	0.8172D 02
1	19	1.000	0.1176D 02	0.4308D 02	0.4935D 02
2	3	1.000	0.2172D 03	0.1265D 05	0.1147D 06
2	4	1.000	0.1811D 03	0.8418D 04	0.2135D 05
2	5	1.000	0.1177D 03	0.3455D 04	0.2893D 03
2	6	1.000	0.5025D 02	0.6571D 03	0.1017D 04
2	7	1.000	0.3265D 02	0.2828D 03	0.3496D 03
2	8	1.000	0.1686D 02	0.9373D 02	0.1715D 03
2	9	1.000	0.2366D 02	0.1764D 03	0.4078D 03
2	10	1.000	0.6721D 01	0.6314D 01	-0.6758D 00
2	11	1.000	-0.7900D-01	-0.2892D 02	0.5757D 02

* * COEFICIENTS FOR TRIAXIAL STRESS EQUATION - CORRELATE COLUMN HEADINGS TO FORM AX**3+BX**2+CX+D=0

TRAN.	PAIR	A	B	C	D
2	12	1.000	0.2065D 02	0.1396D 03	0.3088D 03
2	13	1.000	0.3401D 02	0.3447D 03	0.9559D 03
2	14	1.000	0.1210D 02	0.3267D 02	-0.2019D 02
2	15	1.000	0.1860D 02	0.1079D 03	0.1877D 03
2	16	1.000	0.1550D 02	0.7602D 02	0.1139D 03
2	17	1.000	0.1183D 02	0.3447D 02	0.2876D 00
2	18	1.000	0.1393D 02	0.6105D 02	0.8260D 02
2	19	1.000	0.1179D 02	0.4337D 02	0.4998D 02
3	4	1.000	-0.3613D 02	0.2699D 03	-0.1644D 02
3	5	1.000	-0.9948D 02	0.2761D 04	-0.1865D 05
3	6	1.000	-0.1670D 03	0.7536D 04	-0.5619D 05
3	7	1.000	-0.1846D 03	0.9147D 04	-0.7129D 05
3	8	1.000	-0.2003D 03	0.1031D 05	-0.5000D 05
3	9	1.000	-0.1936D 03	0.9722D 04	-0.5241D 05
3	10	1.000	-0.2105D 03	0.1142D 05	-0.5831D 05
3	11	1.000	-0.2173D 03	0.1205D 05	-0.5474D 05
3	12	1.000	-0.1966D 03	0.9930D 04	-0.4661D 05
3	13	1.000	-0.1832D 03	0.8764D 04	-0.4870D 05
3	14	1.000	-0.2051D 03	0.1137D 05	-0.1056D 06
3	15	1.000	-0.1986D 03	0.1034D 05	-0.6658D 05
3	16	1.000	-0.2017D 03	0.1069D 05	-0.7401D 05
3	17	1.000	-0.2054D 03	0.1121D 05	-0.8556D 05
3	18	1.000	-0.2033D 03	0.1061D 05	-0.4967D 05
3	19	1.000	-0.2054D 03	0.1086D 05	-0.5405D 05
4	5	1.000	-0.6335D 02	0.1079D 04	-0.2348D 04
4	6	1.000	-0.1308D 03	0.4338D 04	-0.3812D 04
4	7	1.000	-0.1484D 03	0.5594D 04	-0.6568D 04
4	8	1.000	-0.1642D 03	0.6469D 04	0.2142D 05
4	9	1.000	-0.1574D 03	0.5997D 04	0.1521D 05
4	10	1.000	-0.1744D 03	0.7342D 04	0.2161D 05
4	11	1.000	-0.1812D 03	0.7861D 04	0.2928D 05
4	12	1.000	-0.1604D 03	0.6158D 04	0.2161D 05
4	13	1.000	-0.1471D 03	0.5244D 04	0.1189D 05
4	14	1.000	-0.1690D 03	0.7390D 04	-0.2198D 05
4	15	1.000	-0.1625D 03	0.6506D 04	0.6845D 04
4	16	1.000	-0.1656D 03	0.6821D 04	0.1436D 04
4	17	1.000	-0.1692D 03	0.7193D 04	-0.3120D 04
4	18	1.000	-0.1672D 03	0.6688D 04	0.2407D 05
4	19	1.000	-0.1693D 03	0.6898D 04	0.2156D 05
5	6	1.000	-0.6748D 02	0.1078D 04	0.2072D 04
5	7	1.000	-0.8508D 02	0.1747D 04	0.2603D 04
5	8	1.000	-0.1009D 03	0.2219D 04	0.1616D 05
5	9	1.000	-0.9408D 02	0.1951D 04	0.1239D 05
5	10	1.000	-0.1110D 03	0.2750D 04	0.1820D 05
5	11	1.000	-0.1178D 03	0.3066D 04	0.2313D 05
5	12	1.000	-0.9708D 02	0.2038D 04	0.1552D 05

* * COEFICIENTS FOR TRIAXIAL STRESS EQUATION - CORRELATE COLUMN HEADINGS TO FORM AX**3+BX**2+CX+D=0

TRAN.	PAIR	A	B	C	D
5	13	1.000	-0.8372D 02	0.1531D 04	0.9459D 04
5	14	1.000	-0.1056D 03	0.2811D 04	-0.1642D 04
5	15	1.000	-0.9913D 02	0.2256D 04	0.9738D 04
5	16	1.000	-0.1022D 03	0.2451D 04	0.7690D 04
5	17	1.000	-0.1059D 03	0.2674D 04	0.6755D 04
5	18	1.000	-0.1038D 03	0.2348D 04	0.1796D 05
5	19	1.000	-0.1059D 03	0.2478D 04	0.1719D 05
6	7	1.000	-0.1760D 02	0.7739D 02	-0.2091D 02
6	8	1.000	-0.3339D 02	0.1867D 03	0.1337D 04
6	9	1.000	-0.2659D 02	0.1183D 03	0.7254D 03
6	10	1.000	-0.4352D 02	0.3722D 03	0.1998D 04
6	11	1.000	-0.5032D 02	0.4880D 03	0.3156D 04
6	12	1.000	-0.2960D 02	0.1361D 03	0.1143D 04
6	13	1.000	-0.1624D 02	0.3106D 02	0.2881D 03
6	14	1.000	-0.3815D 02	0.3928D 03	-0.7126D 03
6	15	1.000	-0.3165D 02	0.2078D 03	0.5398D 03
6	16	1.000	-0.3475D 02	0.2666D 03	0.3502D 03
6	17	1.000	-0.3841D 02	0.3512D 03	0.2557D 03
6	18	1.000	-0.3632D 02	0.2288D 03	0.1705D 04
6	19	1.000	-0.3846D 02	0.2727D 03	0.1660D 04
7	8	1.000	-0.1579D 02	0.9455D 01	0.4236D 03
7	9	1.000	-0.8992D 01	-0.8006D 01	0.1514D 03
7	10	1.000	-0.2593D 02	0.1010D 03	0.8827D 03
7	11	1.000	-0.3273D 02	0.1658D 03	0.1588D 04
7	12	1.000	-0.1200D 02	-0.8046D 01	0.2988D 03
7	13	1.000	0.1363D 01	-0.7955D 01	0.5184D 01
7	14	1.000	-0.2055D 02	0.1202D 03	-0.1657D 03
7	15	1.000	-0.1405D 02	0.2646D 02	0.1596D 03
7	16	1.000	-0.1715D 02	0.5479D 02	0.1163D 03
7	17	1.000	-0.2082D 02	0.9334D 02	0.1597D 03
7	18	1.000	-0.1872D 02	0.2564D 02	0.6212D 03
7	19	1.000	-0.2086D 02	0.4847D 02	0.6380D 03
8	9	1.000	0.6797D 01	0.7220D 01	-0.9079D 01
8	10	1.000	-0.1014D 02	0.2699D 02	-0.6912D 01
8	11	1.000	-0.1694D 02	0.6709D 02	0.3204D 02
8	12	1.000	0.3789D 01	0.3328D 01	0.3992D 00
8	13	1.000	0.1715D 02	0.5953D 02	-0.7589D 02
8	14	1.000	-0.4762D 01	-0.9890D 01	-0.3524D 01
8	15	1.000	0.1742D 01	-0.4844D 01	-0.6447D 01
8	16	1.000	-0.1358D 01	-0.5420D 01	-0.2610D 01
8	17	1.000	-0.5027D 01	0.9411D 00	0.3935D 01
8	18	1.000	-0.2928D 01	0.1405D 01	0.6651D 00
8	19	1.000	-0.5069D 01	0.6748D 01	-0.8640D 00
9	10	1.000	-0.1693D 02	0.6705D 02	0.3211D 02
9	11	1.000	-0.2373D 02	0.1216D 03	0.1724D 03
9	12	1.000	-0.3008D 01	-0.4750D-01	0.3494D 01

* * COEFICIENTS FOR TRIAXIAL STRESS EQUATION - CORRELATE COLUMN HEADINGS TO FORM AX**3+BX**2+CX+D=0

TRAN.	PAIR	A	B	C	D
9	13	1.000	0.1036D 02	0.2441D 02	-0.7255D 01
9	14	1.000	-0.1156D 02	0.4008D 02	-0.4014D 02
9	15	1.000	-0.5055D 01	0.8206D 01	-0.4325D 01
9	16	1.000	-0.8155D 01	0.1749D 02	-0.4127D 01
9	17	1.000	-0.1182D 02	0.4399D 02	-0.5017D 02
9	18	1.000	-0.9725D 01	0.1788D 02	0.2601D 02
9	19	1.000	-0.1187D 02	0.3039D 02	0.2156D 02
10	11	1.000	-0.6800D 01	0.7231D 01	0.9070D 01
10	12	1.000	0.1393D 02	0.5138D 02	0.2107D 02
10	13	1.000	0.2729D 02	0.1727D 03	-0.1336D 03
10	14	1.000	0.5375D 01	-0.3588D 02	-0.1938D 03
10	15	1.000	0.1188D 02	0.2204D 02	-0.8331D 02
10	16	1.000	0.8779D 01	0.2007D 01	-0.8670D 02
10	17	1.000	0.5110D 01	-0.1487D 02	-0.7233D 02
10	18	1.000	0.7209D 01	0.1433D 02	0.4750D 01
10	19	1.000	0.5068D 01	0.6745D 01	0.8639D 00
11	12	1.000	0.2073D 02	0.1021D 03	-0.2578D 02
11	13	1.000	0.3409D 02	0.2552D 03	-0.4307D 03
11	14	1.000	0.1218D 02	-0.3854D 02	-0.5784D 03
11	15	1.000	0.1868D 02	0.5632D 02	-0.2745D 03
11	16	1.000	0.1558D 02	0.2641D 02	-0.2896D 03
11	17	1.000	0.1191D 02	-0.1060D 02	-0.2766D 03
11	18	1.000	0.1401D 02	0.4517D 02	-0.1390D 02
11	19	1.000	0.1187D 02	0.3041D 02	-0.2153D 02
12	13	1.000	0.1336D 02	0.3357D 02	-0.5984D 02
12	14	1.000	-0.8551D 01	0.1403D 02	-0.5691D 01
12	15	1.000	-0.2047D 01	-0.5822D 00	-0.3804D-01
12	16	1.000	-0.5147D 01	0.5504D 01	0.1318D 01
12	17	1.000	-0.8816D 01	0.2174D 02	-0.1641D 02
12	18	1.000	-0.6717D 01	0.1074D 02	0.1682D 01
12	19	1.000	-0.8858D 01	0.2061D 02	-0.5701D 01
13	14	1.000	-0.2191D 02	0.1517D 03	-0.3269D 03
13	15	1.000	-0.1541D 02	0.6475D 02	-0.5368D 02
13	16	1.000	-0.1851D 02	0.9171D 02	-0.8527D 02
13	17	1.000	-0.2218D 02	0.1452D 03	-0.2369D 03
13	18	1.000	-0.2008D 02	0.8472D 02	0.1315D 03
13	19	1.000	-0.2222D 02	0.1094D 03	0.1079D 03
14	15	1.000	0.6504D 01	0.9290D 01	0.2690D 01
14	16	1.000	0.3404D 01	-0.4410D 00	-0.8794D 00
14	17	1.000	-0.2650D 00	-0.1344D 02	0.5460D 01
14	18	1.000	0.1834D 01	-0.2654D 02	0.3905D 02
14	19	1.000	-0.3070D 00	-0.2963D 02	0.6475D 02
15	16	1.000	-0.3100D 01	-0.2025D 00	0.4820D 01
15	17	1.000	-0.6769D 01	0.1264D 02	-0.6423D 01
15	18	1.000	-0.4670D 01	-0.3923D 01	0.2765D 02
15	19	1.000	-0.6811D 01	0.1854D 01	0.3631D 02

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* * COEFICIENTS FOR TRIAXIAL STRESS EQUATION - CORRELATE COLUMN HEADINGS TC FORM AX**3+BX**2+CX+D=0

TRAN. PAIR	A	B	C	D
16 17	1.000	-0.3669D 01	-0.6782D C1	-C.7826D CC
16 18	1.000	-0.1570D 01	-0.1200D C2	C.2022D 02
16 19	1.000	-C.3711D 01	-0.8454D C1	0.3150D 02
17 18	1.000	0.2099D 01	-0.8479D C1	0.2199D 01
17 19	1.000	-0.4200D-01	-0.1371D 02	0.1369D 02
18 19	1.000	-C.2141D 01	0.1124D 01	0.2392D-02

* * PRINCIPAL STRESSES, MAXIMUM STRESS INTENSITY AND ALTERNATING STRESS INTENSITY FOLLOW* *

* * NOTE THAT ALL STRESSES IN THIS PROGRAM ARE IN KSI * *

* NOTE THAT ALTERNATING STRESS INTENSITY HAS BEEN MULTIPLIED BY STRESS CONCENTRATION FACTOR AND E RATIO * *

TRAN.	PAIR	SIGMA 1	SIGMA 2	SIGMA 3	S INT	ALT S.I.
1	0	0.0	-0.000	-0.024	0.024	0.022
2	0	0.0	0.0	-0.056	0.056	0.050
3	0	119.000	87.089	11.061	107.939	97.113
4	0	93.387	84.948	2.689	90.698	81.601
5	0	62.665	54.926	0.083	62.582	56.305
6	0	28.294	20.114	1.782	26.512	23.853
7	0	18.051	13.065	1.475	16.576	14.913
8	0	5.919	6.413	4.470	1.943	1.748
9	0	10.901	8.129	4.569	6.332	5.697
10	0	5.516	1.297	-0.148	5.664	5.096
11	0	6.147	-2.595	-3.687	9.834	8.847
12	0	8.460	6.848	5.283	3.177	2.858
13	0	17.195	12.237	4.522	12.673	11.402
14	0	7.075	5.481	-0.516	7.591	6.829
15	0	8.571	6.766	3.207	5.364	4.826
16	0	6.543	6.051	2.850	3.693	3.323
17	0	6.667	5.119	-0.011	6.678	6.008
18	0	6.445	4.820	2.609	3.836	3.451
19	0	5.782	3.607	2.344	3.438	3.094
1	2	0.0	0.032	0.000	0.032	0.029
1	3	-11.061	-87.113	-119.000	107.939	97.113
1	4	-2.690	-84.971	-93.387	90.697	81.600
1	5	-0.084	-54.949	-62.665	62.581	56.304
1	6	-1.782	-20.138	-28.294	26.512	23.853
1	7	-1.476	-13.088	-18.051	16.575	14.913
1	8	-4.484	-5.919	-6.423	1.939	1.745
1	9	-4.571	-8.151	-10.901	6.330	5.695
1	10	0.125	-1.297	-5.517	5.642	5.076
1	11	3.687	2.571	-6.147	9.834	8.848
1	12	-5.291	-6.864	-8.460	3.169	2.851
1	13	-4.522	-12.261	-17.195	12.673	11.402
1	14	0.516	-5.505	-7.075	7.591	6.829
1	15	-3.209	-6.788	-8.571	5.362	4.824
1	16	-2.851	-6.074	-6.543	3.692	3.322
1	17	0.002	-5.134	-6.667	6.669	6.000
1	18	-2.629	-4.820	-6.449	3.820	3.437
1	19	-2.365	-3.607	-5.785	3.419	3.076
2	3	-11.061	-87.145	-119.000	107.939	97.113
2	4	-2.690	-85.003	-93.387	90.697	81.600
2	5	-0.084	-54.981	-62.665	62.581	56.304
2	6	-1.782	-20.170	-28.294	26.512	23.853
2	7	-1.476	-13.120	-18.051	16.575	14.913
2	8	-4.502	-5.919	-6.437	1.935	1.741
2	9	-4.573	-8.181	-10.901	6.328	5.693
2	10	0.094	-1.297	-5.518	5.613	5.050
2	11	3.687	2.540	-6.148	9.835	8.848

* * PRINCIPAL STRESSES, MAXIMUM STRESS INTENSITY AND ALTERNATING STRESS INTENSITY FOLLOW* *

* * NOTE THAT ALL STRESSES IN THIS PROGRAM ARE IN KSI * *

* NOTE THAT ALTERNATING STRESS INTENSITY HAS BEEN MULTIPLIED BY STRESS CONCENTRATION FACTOR AND E RATIO * *

TRAN.	PAIR	SIGMA 1	SIGMA 2	SIGMA 3	S INT	ALT S.I.
2	12	-5.301	-6.886	-8.460	3.159	2.843
2	13	-4.522	-12.293	-17.195	12.673	11.402
2	14	0.515	-5.536	-7.075	7.590	6.829
2	15	-3.212	-6.817	-8.571	5.359	4.822
2	16	-2.852	-6.105	-6.543	3.691	3.321
2	17	-0.008	-5.156	-6.667	6.659	5.991
2	18	-2.655	-4.820	-6.455	3.800	3.419
2	19	-2.394	-3.607	-5.788	3.394	3.053
3	4	25.613	10.452	0.061	25.552	22.989
3	5	56.335	33.153	9.988	46.347	41.699
3	6	90.706	67.010	9.244	81.462	73.291
3	7	100.949	74.077	9.533	91.416	82.247
3	8	113.081	81.866	5.401	107.680	96.880
3	9	108.099	79.342	6.110	101.989	91.759
3	10	117.703	87.094	5.688	112.015	100.780
3	11	122.687	89.619	4.979	117.708	105.902
3	12	110.540	80.800	5.219	105.321	94.757
3	13	101.805	75.015	6.376	95.429	85.857
3	14	111.925	81.629	11.556	100.369	90.302
3	15	110.429	80.707	7.470	102.959	92.632
3	16	112.457	81.138	8.111	104.346	93.880
3	17	112.333	93.972	9.070	103.263	92.905
3	18	114.180	83.911	5.185	108.995	98.063
3	19	115.393	84.479	5.545	109.848	98.831
4	5	30.722	30.088	2.540	28.182	25.355
4	6	65.093	64.838	0.903	64.190	57.752
4	7	75.336	71.884	1.213	74.123	66.689
4	8	87.468	79.822	-3.068	90.536	81.455
4	9	82.486	77.324	-2.385	84.871	76.359
4	10	92.090	85.028	-2.759	94.849	85.336
4	11	97.074	87.531	-3.446	100.520	90.438
4	12	84.927	78.738	-3.232	88.159	79.317
4	13	76.192	73.016	-2.138	78.330	70.473
4	14	86.312	79.467	-3.205	83.107	74.771
4	15	84.816	78.690	-1.026	85.842	77.232
4	16	86.844	78.945	-0.209	87.053	78.322
4	17	86.720	82.091	0.438	86.282	77.628
4	18	88.567	81.902	-3.319	91.886	82.670
4	19	89.780	82.424	-2.913	92.693	83.396
5	6	34.371	34.844	-1.731	36.574	32.906
5	7	44.614	41.863	-1.394	46.008	41.393
5	8	56.746	49.841	-5.715	62.461	56.196
5	9	51.764	47.365	-5.054	56.818	51.119
5	10	61.368	55.030	-5.389	66.757	60.061
5	11	66.352	57.518	-6.061	72.413	65.150
5	12	54.205	48.751	-5.873	60.078	54.052

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* * PRINCIPAL STRESSES, MAXIMUM STRESS INTENSITY AND ALTERNATING STRESS INTENSITY FOLLOW* *

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* NOTE THAT ALTERNATING STRESS INTENSITY HAS BEEN MULTIPLIED BY STRESS CONCENTRATION FACTOR AND E RATIO * *

TRAN.	PAIR	SIGMA 1	SIGMA 2	SIGMA 3	S INT	ALT S.I.
5	13	45.470	43.079	-4.829	50.299	45.254
5	14	55.590	49.447	0.597	54.993	49.477
5	15	54.094	48.730	-3.694	57.788	51.992
5	16	56.122	48.910	-2.802	58.924	53.014
5	17	55.998	52.211	-2.310	58.308	52.460
5	18	57.845	51.934	-5.979	63.824	57.422
5	19	59.058	52.434	-5.551	64.609	58.129
6	7	10.243	7.067	0.289	9.954	8.956
6	8	22.375	14.998	-3.985	26.360	23.716
6	9	17.393	12.527	-3.329	20.722	18.644
6	10	26.997	20.193	-3.665	30.662	27.586
6	11	31.981	22.693	-4.349	36.330	32.686
6	12	19.834	13.908	-4.143	23.977	21.572
6	13	11.099	8.274	-3.137	14.236	12.808
6	14	21.219	14.636	2.295	18.924	17.026
6	15	19.723	13.893	-1.970	21.693	19.517
6	16	21.751	14.134	-1.139	22.890	20.594
6	17	21.627	17.465	-0.677	22.304	20.067
6	18	23.474	17.092	-4.250	27.724	24.943
6	19	24.687	17.593	-3.823	28.510	25.650
7	8	12.132	8.014	-4.357	16.489	14.835
7	9	7.150	5.614	-3.772	10.922	9.827
7	10	16.754	13.172	-4.000	20.754	18.672
7	11	21.738	15.655	-4.667	26.405	23.757
7	12	9.591	6.914	-4.505	14.096	12.682
7	13	1.590	0.856	-3.809	5.399	4.857
7	14	10.976	7.584	1.991	8.985	8.084
7	15	9.480	6.980	-2.413	11.893	10.700
7	16	11.508	7.069	-1.430	12.938	11.640
7	17	11.384	10.739	-1.307	12.691	11.418
7	18	13.231	10.124	-4.638	17.869	16.076
7	19	14.444	10.586	-4.172	18.616	16.749
8	9	0.719	-2.534	-4.982	5.701	5.129
8	10	5.229	4.622	0.286	4.943	4.447
8	11	9.606	7.761	-0.430	10.036	9.029
8	12	-0.142	-1.106	-2.541	2.399	2.158
8	13	0.981	-6.857	-11.276	12.257	11.028
8	14	6.395	-0.477	-1.156	7.551	6.793
8	15	2.079	-1.169	-2.652	4.731	4.257
8	16	3.264	-0.624	-1.282	4.545	4.089
8	17	4.642	1.133	-0.748	5.390	4.849
8	18	2.115	1.099	-0.286	2.401	2.160
8	19	2.614	2.312	0.143	2.471	2.223
9	10	9.604	7.761	-0.431	10.035	9.028
9	11	14.588	10.294	-1.148	15.736	14.158
9	12	2.441	1.513	-0.946	3.387	3.047

* * PRINCIPAL STRESSES, MAXIMUM STRESS INTENSITY AND ALTERNATING STRESS INTENSITY FOLLOW* *

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* NOTE THAT ALTERNATING STRESS INTENSITY HAS BEEN MULTIPLIED BY STRESS CONCENTRATION FACTOR AND E RATIC * *

TRAN.	PAIR	SIGMA 1	SIGMA 2	SIGMA 3	S INT	ALT S.I.
9	13	0.266	-4.327	-6.294	6.560	5.902
9	14	5.978	3.826	1.755	4.223	3.799
9	15	2.330	1.366	1.359	0.971	0.873
9	16	4.358	3.529	0.268	4.090	3.679
9	17	5.393	4.234	2.197	3.195	2.875
9	18	6.081	4.578	-0.934	7.015	6.312
9	19	7.294	5.146	-0.574	7.868	7.079
10	11	4.984	2.534	-0.718	5.702	5.130
10	12	-0.467	-6.296	-7.163	6.696	6.024
10	13	0.695	-12.086	-15.898	16.593	14.929
10	14	5.997	-5.594	-5.778	11.775	10.594
10	15	1.791	-6.396	-7.274	9.065	8.156
10	16	2.666	-5.246	-6.199	8.865	7.976
10	17	3.802	-3.542	-5.370	9.172	8.252
10	18	-0.412	-3.274	-3.523	3.111	2.799
10	19	-0.143	-2.310	-2.615	2.472	2.224
11	12	0.241	-8.820	-12.147	12.388	11.145
11	13	1.411	-14.618	-20.882	22.293	20.057
11	14	6.658	-8.071	-10.762	17.420	15.673
11	15	2.508	-8.929	-12.258	14.766	13.285
11	16	3.281	-8.630	-10.230	13.511	12.155
11	17	4.449	-6.005	-10.354	14.803	13.318
11	18	0.283	-5.785	-8.507	8.790	7.908
11	19	0.573	-5.147	-7.294	7.867	7.078
12	13	1.180	-5.808	-8.735	9.915	8.920
12	14	6.537	1.385	0.629	5.909	5.316
12	15	2.307	-0.111	-0.149	2.455	2.209
12	16	3.430	1.917	-0.200	3.631	3.267
12	17	5.295	1.793	1.728	3.567	3.209
12	18	3.640	3.220	-0.143	3.783	3.404
12	19	4.853	3.686	0.319	4.534	4.080
13	14	10.120	7.468	4.326	5.794	5.213
13	15	8.624	5.693	1.093	7.531	6.775
13	16	10.652	6.655	1.203	9.449	8.501
13	17	10.528	9.207	2.444	8.084	7.273
13	18	12.375	8.899	-1.194	13.569	12.208
13	19	13.588	9.471	-0.838	14.426	12.979
14	15	-0.389	-1.496	-4.619	4.229	3.805
14	16	0.532	-0.478	-3.458	3.990	3.590
14	17	3.587	0.408	-3.730	7.318	6.584
14	18	-6.681	2.592	2.255	9.273	8.343
14	19	-6.182	3.468	3.021	9.650	8.682
15	16	2.028	2.168	-1.096	3.264	2.937
15	17	4.027	1.904	0.838	3.190	2.870
15	18	3.751	3.213	-2.294	6.045	5.439
15	19	4.964	3.781	-1.934	6.898	6.206

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* * PRINCIPAL STRESSES, MAXIMUM STRESS INTENSITY AND ALTERNATING STRESS INTENSITY FOLLOW* *

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* NOTE THAT ALTERNATING STRESS INTENSITY HAS BEEN MULTIPLIED BY STRESS CONCENTRATION FACTOR AND E RATIO * *

TRAN.	PAIR	SIGMA 1	SIGMA 2	SIGMA 3	S INT	ALT S.I.
16	17	5.044	-0.124	-1.251	6.295	5.664
16	18	3.350	1.723	-3.503	6.853	6.166
16	19	3.686	2.936	-2.911	6.597	5.935
17	18	1.847	0.282	-4.228	6.075	5.465
17	19	3.060	1.089	-4.107	7.167	6.449
18	19	1.213	0.930	-0.002	1.215	1.093

* * ALTERNATING STRESS INTENSITIES ORDERED FROM MAX TO MIN

* * NOTE THAT ZERO TRANSIENT NUMBER INDICATES NULL CONDITIONS

TRAN.	PAIR	SPECIFIED NO. CYCLES	ALT. S.I.	N	U	TRAN.	CYCLES REMAINING	TRAN.	CYCLES REMAINING	TRAN ELIMINATED
3	11	500	105.902	1150	.4348	3	0	11	998850	3
3	10	500	100.780							
3	19	500	98.831							
3	18	260	98.063							
3	0	500	97.113							
1	3	100	97.113							
2	3	500	97.113	TRAN. #3 ELIMINATED						
3	8	500	96.880							
3	12	500	94.757							
3	16	500	93.880							
3	17	260	92.905							
3	15	500	92.632							
3	9	500	91.759							
4	11	260	90.438	1900	.1368	4	0	11	996950	4
3	14	500	90.302							
3	13	500	85.857							
4	10	260	85.336							
4	19	260	83.396							
4	18	260	82.670							
3	7	260	82.247							
4	0	260	81.601							
1	4	100	81.600							
2	4	260	81.600							
4	8	260	81.455							
4	12	260	79.317							
4	16	260	78.322	TRANSIENTS #3 & #4 ELIMINATED						
4	17	260	77.628							
4	15	260	77.232							
4	9	260	76.359							
4	14	260	74.771							
3	6	260	73.291							
4	13	260	70.473							
4	7	260	66.689							
5	11	260	65.150	7000	.0371	5	0	11	989950	5
5	10	260	60.061							
5	19	260	58.129							
4	6	260	57.752							
5	18	260	57.423							
5	0	260	56.305							
1	5	100	56.304							
2	5	260	56.304	TRANSIENTS #3, #4, & #5 ELIMINATED						
5	8	260	56.196							
5	12	260	54.052							
5	16	260	53.014							
5	17	260	52.460							
5	15	260	51.992							

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* * ALTERNATING STRESS INTENSITIES ORDERED FROM MAX TO MIN

* * NOTE THAT ZERO TRANSIENT NUMBER INDICATES NULL CONDITIONS

TRAN.	PAIR	SPECIFIED NO. CYCLES	ALT. S.I.
5	9	260	51.119
5	14	260	49.477
5	13	260	45.254
3	5	260	41.699
5	7	260	41.393
5	6	260	32.906
6	11	260	32.686
6	10	260	27.586
6	19	260	25.650
4	5	260	25.355
6	18	260	24.943
6	0	260	23.853
1	6	100	23.853
2	6	260	23.853
7	11	260	23.757
6	8	260	23.716
3	4	260	22.989
6	12	260	21.572
6	16	260	20.594
6	17	260	20.067
11	13	11000	20.057
6	15	260	19.517
7	10	260	18.672
6	9	260	18.644
6	14	260	17.026
7	19	260	16.749
7	18	260	16.076
11	14	1500	15.673
10	13	11000	14.929
7	0	260	14.913
1	7	100	14.913
2	7	260	14.913
7	8	260	14.835
9	11	1000000	14.158
11	17	260	13.318
11	15	1500	13.285
13	19	11000	12.979
6	13	260	12.808
7	12	260	12.682
13	18	260	12.208
11	16	1500	12.155
7	16	260	11.640
7	17	260	11.418
13	0	11000	11.402
1	13	100	11.402
2	13	2600	11.402

N	u	TRAN.	CYCLES REMAINING	TRAN.	CYCLES REMAINING	TRAN. ELIMINATED
TRANSIENTS #3, #4, & #5			ELIMINATED			
300,000	.0009	6	0	11	689950	6
TRANSIENT #6 ELIMINATED						

$\Sigma u = 0.6095$

NO USAGE BELOW 26.0 KSI

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* * ALTERNATING STRESS INTENSITIES ORDERED FROM MAX TO MIN

* * NOTE THAT ZERO TRANSIENT NUMBER INDICATES NULL CONDITIONS

TRAN.	PAIR	SPECIFIED NO. CYCLES	ALT. S.I.
11	12	11000	11.145
8	13	11000	11.028
7	15	260	10.700
10	14	1500	10.594
7	9	260	9.827
8	11	1000000	9.029
9	10	1000000	9.028
6	7	260	8.956
12	13	11000	8.920
2	11	2600	8.848
1	11	100	8.848
11	0	1000000	8.847
14	19	1500	8.682
13	16	1500	8.501
14	18	260	8.343
10	17	260	8.252
10	15	1500	8.156
7	14	260	8.084
10	16	1500	7.976
11	18	260	7.908
13	17	260	7.273
9	19	1000000	7.079
11	19	1000000	7.078
14	0	1500	6.829
1	14	100	6.829
2	14	1500	6.829
8	14	1500	6.793
13	15	1500	6.775
14	17	260	6.584
17	19	260	6.449
9	18	260	6.312
15	19	1500	6.206
16	18	260	6.166
10	12	11000	6.024
17	0	260	6.008
1	17	100	6.000
2	17	260	5.991
16	19	1500	5.935
9	13	11000	5.902
9	0	1000000	5.697
1	9	100	5.695
2	9	2600	5.693
16	17	260	5.664
17	18	260	5.465
15	18	260	5.439
12	14	1500	5.316

* * ALTERNATING STRESS INTENSITIES ORDERED FROM MAX TO MIN

* * NOTE THAT ZERO TRANSIENT NUMBER INDICATES NULL CONDITIONS

TRAN.	PAIR	SPECIFIED NO. CYCLES	ALT. S.I.
13	14	1500	5.213
10	11	1000000	5.130
8	9	10000000	5.129
10	0	10000000	5.096
1	10	100	5.076
2	10	2600	5.050
7	13	260	4.857
8	17	260	4.849
15	0	1500	4.826
1	15	100	4.824
2	15	1500	4.822
8	10	10000000	4.447
8	15	1500	4.257
8	16	1500	4.089
12	19	11000	4.080
14	15	1500	3.805
9	14	1500	3.799
9	16	1500	3.679
14	16	1500	3.590
18	0	260	3.451
1	18	100	3.437
2	18	260	3.419
12	18	260	3.404
16	0	1500	3.323
1	16	100	3.322
2	16	1500	3.321
12	16	1500	3.267
12	17	260	3.209
19	0	1000000	3.094
1	19	100	3.076
2	19	2600	3.053
9	12	11000	3.047
15	16	1500	2.937
9	17	260	2.875
15	17	260	2.870
12	0	11000	2.858
1	12	100	2.851
2	12	2600	2.843
10	18	260	2.799
10	19	10000000	2.224
8	19	10000000	2.223
12	15	1500	2.209
8	18	260	2.160
8	12	11000	2.158
8	0	1000000	1.748
1	8	100	1.745

* * ALTERNATING STRESS INTENSITIES ORDERED FROM MAX TO MIN

* * NOTE THAT ZERO TRANSIENT NUMBER INDICATES NULL CONDITIONS

TRAN.	PAIR	SPECIFIED NO. CYCLES	ALT. S.I.
2	8	2600	1.741
18	19	260	1.093
9	15	1500	0.873
2	0	2600	0.050
1	2	100	0.029
1	0	100	0.022

EMERGENCY CONDITIONS

PARAGRAPH NB-3224 DEFINES STRESS LIMITS FOR EMERGENCY CONDITIONS. SAFE SHUTDOWN EARTHQUAKE (SSE) IS THE EMERGENCY LOAD WHICH MUST BE CONSIDERED. THE LOAD CASE COMBINATION LISTED AS DBE IN COMBINATION WITH OPERATING TEMPERATURE AND PRESSURE, AS SHOWN ON PAGE 4-36 OF VOLUME I OF THE BTI REPORT, IS INCORRECTLY LISTED AS A FAULTED CONDITION LOAD. USING THE BTI CALCULATIONS, THE RESULTS OF WHICH ARE SHOWN ON PAGE 4-38 OF VOLUME I OF THE BTI REPORT, IT CAN BE SEEN THAT GENERAL PRIMARY MEMBRANE STRESSES ARE WITHIN THE 1.2 S_M ALLOWABLE STRESS LIMIT. AS LISTED IN THE AFOREMENTIONED RESULTS, THE MAXIMUM VALUE OF 6,580 PSI FOR THE NOZZLE OCCURS NEAR PROFILE 1. THE ALLOWABLE LIMIT OF 1.2 S_M (1.2 x 16600 = 19920 PSI) OR 19,920 PSI IS CONSIDERABLY HIGHER THAN THE STRESS LEVEL. AS LISTED IN THE BTI REPORT, THE EMERGENCY CONDITION STRESSES IN THE PRESSURIZER SHELL PORTION OF THE MODEL ARE SOMEWHAT HIGHER THAN THE SURGE NOZZLE STRESSES BUT ARE STILL WITHIN ALLOWABLE LIMITS.

FAULTED CONDITIONS

AS LISTED IN APPENDIX F, PAGE 483, OF THE ASME CODE, THE PRIMARY STRESS LIMITS FOR FAULTED CONDITIONS ARE 2.4 S_M OR 0.7 S_u, WHICHEVER IS LESS. LOSS OF COOLANT ACCIDENT (LOCA) PLUS SSE (DBE IN BTI REPORT) LOADS COMPRISE THE FAULTED CONDITION LOADS. GENERAL PRIMARY MEMBRANE STRESS VALUES FOR LOCA + SSE + PRESSURE LOADS ARE SHOWN IN TABLE 4.1.2-6, PAGE 4-6, VOLUME I, OF THE BTI REPORT. USING THESE VALUES, IT CAN BE SEEN THAT FAULTED CONDITION STRESS INTENSITIES ARE WITHIN ALLOWABLE LIMITS AS SHOWN BELOW:

MAX. GEN. PRIMARY MEMBRANE STRESS IN NOZZLE (PROFILE 1) = 8,540 PSI

$2.4 S_M = 2.4 (16,600) = 39,840$ PSI

$.7 S_u = .7 (75,000) = 52\,500$ PSI

$\Rightarrow$ 39,840 PSI IS LIMIT

$8,540 < 39,840$

$\Rightarrow$ FAULTED CONDITION STRESS REQUIREMENTS ARE SATISFIED.

APPENDIX C

SAAS III SPRAY NOZZLE OUTPUT

*****
TIME REMAINING AT BEGINNING OF RUN IS 114 SECONDS.
*****

*****
TIME REMAINING AFTER TRANSFER OF INPUT DATA TO UNIT 9 IS 110 SECONDS.
*****

SURGE NOZZLE STEP CHANGE

START PARAMETER	1
STOP PARAMETER	0
DEFORMED GRID PLOT. IF 1, PLOT.	0
PLOT SIZE. 1=SMALL,2=LARGE,101 OR 102=SMALL OR LARGE WITH SPECIFIED DIMENSIONS.	2
NUMBER OF APPROXIMATIONS	0
MESH PARAMETER. IF 1, GENERATE MESH	0
NUMBER OF TEMPERATURE CARDS	-3
NUMBER OF NODAL POINTS	397
NUMBER OF ELEMENTS	349
NUMBER OF INTERNAL PRESSURES	0
NUMBER OF MATERIALS	1
NUMBER OF EXTERNAL PRESSURES	80
NUMBER OF SHEAR CARDS	0
REFERENCE TEMPERATURE	0.700DE 02
PLOTSHRINK FACTOR. IF 1, NO SHRINK	1.000
IF NOT 0, OUTPUT GENERATED FOR TAP OR COUPLE	0
IF 1, STRESS OUTPUT STORED ON TAPE	0
TAP OR COUPLE OUTPUT UNIT. 7=DECK,8=TAPE	0
MAXIMUM # OF MATERIAL PROPERTY CARDS ALLOWED	7
CONNECTIVITY. MAXI IF IMESH=1, OTHERWISE, MAX. NODE DIFFERENCE.	18
STORAGE FOR MAXJ IF IMESH=1. OTHERWISE,1	1
INPUT UNIT FOR NODE AND ELEMENT DATA	9
CONTOUR PLOTS. IF 1, CONTOURS ARE REQUESTED	0
NUMBER OF BLOCK ASSIGNMENT CARDS	0
PLOT UNIT DEVICE. 1=SMALL CALCOMP PLOTTER OR MICROFILM. 2=LARGE CALCOMP PLOTTER OR MICROFI	1

******

BLANK COMMON IS NOW 17000
UNUSED STORAGE= 11000

*****
TIME REMAINING, 110 SECONDS
*****

*** TRANSIENT TEMPERATURES WILL BE INPUT ON UNIT 11.

NUMBER OF TENSION-COMPRESSION APPROXIMATIONS---- 0

MESH GENERATION WOULD OCCUR HERE IF REQUESTED.

*****
TIME REMAINING, 110 SECONDS
*****

NODAL POINT	TYPE	R-ORDINATE	Z-ORDINATE	R LOAD OR DISPLACEMENT	Z LOAD OR DISPLACEMENT	TEMPERATURE	PRESSURE
1	0.0	0.407	9.120	0.0	0.0	0.0	0.0
2	0.0	0.457	9.120	0.0	0.0	0.0	0.0
3	0.0	0.507	9.120	0.0	0.0	0.0	0.0
4	0.0	0.558	9.120	0.0	0.0	0.0	0.0
5	0.0	0.608	9.120	0.0	0.0	0.0	0.0
6	0.0	0.658	9.120	0.0	0.0	0.0	0.0
7	0.0	0.407	8.920	0.0	0.0	0.0	0.0
8	0.0	0.457	8.920	0.0	0.0	0.0	0.0
9	0.0	0.507	8.920	0.0	0.0	0.0	0.0
10	0.0	0.558	8.920	0.0	0.0	0.0	0.0
11	0.0	0.608	8.920	0.0	0.0	0.0	0.0
12	0.0	0.658	8.920	0.0	0.0	0.0	0.0
13	0.0	0.407	8.720	0.0	0.0	0.0	0.0
14	0.0	0.457	8.720	0.0	0.0	0.0	0.0
15	0.0	0.507	8.720	0.0	0.0	0.0	0.0
16	0.0	0.558	8.720	0.0	0.0	0.0	0.0
17	0.0	0.608	8.720	0.0	0.0	0.0	0.0
18	0.0	0.658	8.720	0.0	0.0	0.0	0.0
19	0.0	0.407	8.520	0.0	0.0	0.0	0.0
20	0.0	0.457	8.520	0.0	0.0	0.0	0.0
21	0.0	0.507	8.520	0.0	0.0	0.0	0.0
22	0.0	0.558	8.520	0.0	0.0	0.0	0.0
23	0.0	0.608	8.520	0.0	0.0	0.0	0.0
24	0.0	0.658	8.520	0.0	0.0	0.0	0.0
25	0.0	0.407	8.320	0.0	0.0	0.0	0.0
26	0.0	0.457	8.320	0.0	0.0	0.0	0.0
27	0.0	0.507	8.320	0.0	0.0	0.0	0.0
28	0.0	0.558	8.320	0.0	0.0	0.0	0.0
29	0.0	0.608	8.320	0.0	0.0	0.0	0.0
30	0.0	0.658	8.320	0.0	0.0	0.0	0.0
31	0.0	0.407	8.120	0.0	0.0	0.0	0.0
32	0.0	0.457	8.120	0.0	0.0	0.0	0.0
33	0.0	0.507	8.120	0.0	0.0	0.0	0.0
34	0.0	0.558	8.120	0.0	0.0	0.0	0.0
35	0.0	0.608	8.120	0.0	0.0	0.0	0.0
36	0.0	0.658	8.120	0.0	0.0	0.0	0.0
37	0.0	0.407	7.920	0.0	0.0	0.0	0.0
38	0.0	0.457	7.920	0.0	0.0	0.0	0.0
39	0.0	0.507	7.920	0.0	0.0	0.0	0.0
40	0.0	0.558	7.920	0.0	0.0	0.0	0.0

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NODAL POINT	TYPE	R-ORDINATE	Z-ORDINATE	R LOAD OR DISPLACEMENT	Z LOAD OR DISPLACEMENT	TEMPERATURE	PRESSURE
41	0.0	0.608	7.920	0.0	0.0	0.0	0.0
42	0.0	0.658	7.920	0.0	0.0	0.0	0.0
43	0.0	0.407	7.720	0.0	0.0	0.0	0.0
44	0.0	0.457	7.720	0.0	0.0	0.0	0.0
45	0.0	0.507	7.720	0.0	0.0	0.0	0.0
46	0.0	0.558	7.720	0.0	0.0	0.0	0.0
47	0.0	0.608	7.720	0.0	0.0	0.0	0.0
48	0.0	0.658	7.720	0.0	0.0	0.0	0.0
49	0.0	0.407	7.520	0.0	0.0	0.0	0.0
50	0.0	0.457	7.520	0.0	0.0	0.0	0.0
51	0.0	0.507	7.520	0.0	0.0	0.0	0.0
52	0.0	0.558	7.520	0.0	0.0	0.0	0.0
53	0.0	0.608	7.520	0.0	0.0	0.0	0.0
54	0.0	0.658	7.520	0.0	0.0	0.0	0.0
55	0.0	0.407	7.320	0.0	0.0	0.0	0.0
56	0.0	0.457	7.320	0.0	0.0	0.0	0.0
57	0.0	0.507	7.320	0.0	0.0	0.0	0.0
58	0.0	0.558	7.320	0.0	0.0	0.0	0.0
59	0.0	0.608	7.320	0.0	0.0	0.0	0.0
60	0.0	0.658	7.320	0.0	0.0	0.0	0.0
61	0.0	0.407	7.120	0.0	0.0	0.0	0.0
62	0.0	0.457	7.120	0.0	0.0	0.0	0.0
63	0.0	0.507	7.120	0.0	0.0	0.0	0.0
64	0.0	0.558	7.120	0.0	0.0	0.0	0.0
65	0.0	0.608	7.120	0.0	0.0	0.0	0.0
66	0.0	0.658	7.120	0.0	0.0	0.0	0.0
67	0.0	0.407	6.920	0.0	0.0	0.0	0.0
68	0.0	0.457	6.920	0.0	0.0	0.0	0.0
69	0.0	0.507	6.920	0.0	0.0	0.0	0.0
70	0.0	0.558	6.920	0.0	0.0	0.0	0.0
71	0.0	0.608	6.920	0.0	0.0	0.0	0.0
72	0.0	0.658	6.920	0.0	0.0	0.0	0.0
73	0.0	0.744	6.970	0.0	0.0	0.0	0.0
74	0.0	0.407	6.720	0.0	0.0	0.0	0.0
75	0.0	0.457	6.720	0.0	0.0	0.0	0.0
76	0.0	0.507	6.720	0.0	0.0	0.0	0.0
77	0.0	0.558	6.720	0.0	0.0	0.0	0.0
78	0.0	0.608	6.720	0.0	0.0	0.0	0.0
79	0.0	0.658	6.720	0.0	0.0	0.0	0.0
80	0.0	0.739	6.767	0.0	0.0	0.0	0.0

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NODAL POINT	TYPE	R-ORDINATE	Z-ORDINATE	R LOAD OR DISPLACEMENT	Z LOAD OR DISPLACEMENT	TEMPERATURE	PRESSURE
81	0.0	0.831	6.820	0.0	0.0	0.0	0.0
82	0.0	0.407	6.520	0.0	0.0	0.0	0.0
83	0.0	0.457	6.520	0.0	0.0	0.0	0.0
84	0.0	0.507	6.520	0.0	0.0	0.0	0.0
85	0.0	0.558	6.520	0.0	0.0	0.0	0.0
86	0.0	0.608	6.520	0.0	0.0	0.0	0.0
87	0.0	0.658	6.520	0.0	0.0	0.0	0.0
88	0.0	0.733	6.564	0.0	0.0	0.0	0.0
89	0.0	0.825	6.617	0.0	0.0	0.0	0.0
90	0.0	0.917	6.670	0.0	0.0	0.0	0.0
91	0.0	0.407	6.320	0.0	0.0	0.0	0.0
92	0.0	0.457	6.320	0.0	0.0	0.0	0.0
93	0.0	0.507	6.320	0.0	0.0	0.0	0.0
94	0.0	0.558	6.320	0.0	0.0	0.0	0.0
95	0.0	0.608	6.320	0.0	0.0	0.0	0.0
96	0.0	0.658	6.320	0.0	0.0	0.0	0.0
97	0.0	0.727	6.360	0.0	0.0	0.0	0.0
98	0.0	0.819	6.413	0.0	0.0	0.0	0.0
99	0.0	0.912	6.467	0.0	0.0	0.0	0.0
100	0.0	1.004	6.520	0.0	0.0	0.0	0.0
101	0.0	0.407	6.120	0.0	0.0	0.0	0.0
102	0.0	0.457	6.120	0.0	0.0	0.0	0.0
103	0.0	0.507	6.120	0.0	0.0	0.0	0.0
104	0.0	0.558	6.120	0.0	0.0	0.0	0.0
105	0.0	0.608	6.120	0.0	0.0	0.0	0.0
106	0.0	0.658	6.120	0.0	0.0	0.0	0.0
107	0.0	0.722	6.157	0.0	0.0	0.0	0.0
108	0.0	0.814	6.210	0.0	0.0	0.0	0.0
109	0.0	0.906	6.263	0.0	0.0	0.0	0.0
110	0.0	0.998	6.317	0.0	0.0	0.0	0.0
111	0.0	1.090	6.370	0.0	0.0	0.0	0.0
112	0.0	0.407	5.920	0.0	0.0	0.0	0.0
113	0.0	0.457	5.920	0.0	0.0	0.0	0.0
114	0.0	0.507	5.920	0.0	0.0	0.0	0.0
115	0.0	0.558	5.920	0.0	0.0	0.0	0.0
116	0.0	0.608	5.920	0.0	0.0	0.0	0.0
117	0.0	0.658	5.920	0.0	0.0	0.0	0.0
118	0.0	0.716	5.954	0.0	0.0	0.0	0.0
119	0.0	0.808	6.007	0.0	0.0	0.0	0.0
120	0.0	0.900	6.060	0.0	0.0	0.0	0.0

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NODAL POINT	TYPE	R-CRDINATE	Z-CRDINATE	R LOAD OR DISPLACEMENT	Z LCAD OR DISPLACEMENT	TEMPERATURE	PRESSURE
121	0.0	0.993	6.113	0.0	0.0	0.0	0.0
122	0.0	1.085	6.167	0.0	0.0	0.0	0.0
123	0.0	1.177	6.220	0.0	0.0	0.0	0.0
124	0.0	0.407	5.720	0.0	0.0	0.0	0.0
125	0.0	0.457	5.720	0.0	0.0	0.0	0.0
126	0.0	0.507	5.720	0.0	0.0	0.0	0.0
127	0.0	0.558	5.720	0.0	0.0	0.0	0.0
128	0.0	0.608	5.720	0.0	0.0	0.0	0.0
129	0.0	0.658	5.720	0.0	0.0	0.0	0.0
130	0.0	0.744	5.770	0.0	0.0	0.0	0.0
131	0.0	0.802	5.804	0.0	0.0	0.0	0.0
132	0.0	0.895	5.857	0.0	0.0	0.0	0.0
133	0.0	0.987	5.910	0.0	0.0	0.0	0.0
134	0.0	1.079	5.963	0.0	0.0	0.0	0.0
135	0.0	1.171	6.017	0.0	0.0	0.0	0.0
136	0.0	1.264	6.070	0.0	0.0	0.0	0.0
137	0.0	0.407	5.520	0.0	0.0	0.0	0.0
138	0.0	0.457	5.520	0.0	0.0	0.0	0.0
139	0.0	0.507	5.520	0.0	0.0	0.0	0.0
140	0.0	0.558	5.520	0.0	0.0	0.0	0.0
141	0.0	0.608	5.520	0.0	0.0	0.0	0.0
142	0.0	0.658	5.520	0.0	0.0	0.0	0.0
143	0.0	0.744	5.570	0.0	0.0	0.0	0.0
144	0.0	0.831	5.620	0.0	0.0	0.0	0.0
145	0.0	0.889	5.654	0.0	0.0	0.0	0.0
146	0.0	0.981	5.707	0.0	0.0	0.0	0.0
147	0.0	1.074	5.760	0.0	0.0	0.0	0.0
148	0.0	1.166	5.813	0.0	0.0	0.0	0.0
149	0.0	1.258	5.867	0.0	0.0	0.0	0.0
150	0.0	1.350	5.920	0.0	0.0	0.0	0.0
151	0.0	0.407	5.320	0.0	0.0	0.0	0.0
152	0.0	0.457	5.320	0.0	0.0	0.0	0.0
153	0.0	0.507	5.320	0.0	0.0	0.0	0.0
154	0.0	0.558	5.320	0.0	0.0	0.0	0.0
155	0.0	0.608	5.320	0.0	0.0	0.0	0.0
156	0.0	0.658	5.320	0.0	0.0	0.0	0.0
157	0.0	0.744	5.370	0.0	0.0	0.0	0.0
158	0.0	0.831	5.420	0.0	0.0	0.0	0.0
159	0.0	0.917	5.470	0.0	0.0	0.0	0.0
160	0.0	0.976	5.504	0.0	0.0	0.0	0.0

NODAL POINT	TYPE	R-ORDINATE	Z-ORDINATE	R LOAD OR DISPLACEMENT	Z LOAD OR DISPLACEMENT	TEMPERATURE	PRESSURE
161	0.0	1.068	5.557	0.0	0.0	0.0	0.0
162	0.0	1.160	5.610	0.0	0.0	0.0	0.0
163	0.0	1.252	5.663	0.0	0.0	0.0	0.0
164	0.0	1.345	5.717	0.0	0.0	0.0	0.0
165	0.0	1.437	5.770	0.0	0.0	0.0	0.0
166	0.0	0.407	5.120	0.0	0.0	0.0	0.0
167	0.0	0.457	5.120	0.0	0.0	0.0	0.0
168	0.0	0.507	5.120	0.0	0.0	0.0	0.0
169	0.0	0.558	5.120	0.0	0.0	0.0	0.0
170	0.0	0.608	5.120	0.0	0.0	0.0	0.0
171	0.0	0.658	5.120	0.0	0.0	0.0	0.0
172	0.0	0.712	5.225	0.0	0.0	0.0	0.0
173	0.0	0.768	5.329	0.0	0.0	0.0	0.0
174	0.0	0.877	5.340	0.0	0.0	0.0	0.0
175	0.0	1.004	5.320	0.0	0.0	0.0	0.0
176	0.0	1.062	5.354	0.0	0.0	0.0	0.0
177	0.0	1.155	5.407	0.0	0.0	0.0	0.0
178	0.0	1.247	5.460	0.0	0.0	0.0	0.0
179	0.0	1.339	5.513	0.0	0.0	0.0	0.0
180	0.0	1.431	5.567	0.0	0.0	0.0	0.0
181	0.0	1.524	5.620	0.0	0.0	0.0	0.0
182	0.0	0.407	4.920	0.0	0.0	0.0	0.0
183	0.0	0.457	4.920	0.0	0.0	0.0	0.0
184	0.0	0.507	4.920	0.0	0.0	0.0	0.0
185	0.0	0.558	4.920	0.0	0.0	0.0	0.0
186	0.0	0.608	4.920	0.0	0.0	0.0	0.0
187	0.0	0.658	4.920	0.0	0.0	0.0	0.0
188	0.0	1.149	5.204	0.0	0.0	0.0	0.0
189	0.0	1.241	5.263	0.0	0.0	0.0	0.0
190	0.0	1.333	5.322	0.0	0.0	0.0	0.0
191	0.0	1.426	5.381	0.0	0.0	0.0	0.0
192	0.0	1.518	5.441	0.0	0.0	0.0	0.0
193	0.0	1.610	5.500	0.0	0.0	0.0	0.0
194	0.0	0.407	4.720	0.0	0.0	0.0	0.0
195	0.0	0.457	4.720	0.0	0.0	0.0	0.0
196	0.0	0.507	4.720	0.0	0.0	0.0	0.0
197	0.0	0.558	4.720	0.0	0.0	0.0	0.0
198	0.0	0.608	4.720	0.0	0.0	0.0	0.0
199	0.0	0.658	4.720	0.0	0.0	0.0	0.0
200	0.0	1.236	5.054	0.0	0.0	0.0	0.0

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NODAL POINT	TYPE	R-ORDINATE	Z-ORDINATE	R LOAD OR DISPLACEMENT	Z LOAD OR DISPLACEMENT	TEMPERATURE	PRESSURE
201	0.0	1.328	5.107	0.0	0.0	0.0	0.0
202	0.0	1.420	5.160	0.0	0.0	0.0	0.0
203	0.0	1.512	5.213	0.0	0.0	0.0	0.0
204	0.0	1.604	5.267	0.0	0.0	0.0	0.0
205	0.0	1.697	5.320	0.0	0.0	0.0	0.0
206	0.0	0.407	4.520	0.0	0.0	0.0	0.0
207	0.0	0.457	4.520	0.0	0.0	0.0	0.0
208	0.0	0.507	4.520	0.0	0.0	0.0	0.0
209	0.0	0.558	4.520	0.0	0.0	0.0	0.0
210	0.0	0.608	4.520	0.0	0.0	0.0	0.0
211	0.0	0.658	4.520	0.0	0.0	0.0	0.0
212	0.0	1.322	4.904	0.0	0.0	0.0	0.0
213	0.0	1.414	4.957	0.0	0.0	0.0	0.0
214	0.0	1.507	5.010	0.0	0.0	0.0	0.0
215	0.0	1.599	5.063	0.0	0.0	0.0	0.0
216	0.0	1.691	5.117	0.0	0.0	0.0	0.0
217	0.0	1.783	5.170	0.0	0.0	0.0	0.0
218	0.0	0.407	4.320	0.0	0.0	0.0	0.0
219	0.0	0.457	4.320	0.0	0.0	0.0	0.0
220	0.0	0.507	4.320	0.0	0.0	0.0	0.0
221	0.0	0.558	4.320	0.0	0.0	0.0	0.0
222	0.0	0.608	4.320	0.0	0.0	0.0	0.0
223	0.0	0.658	4.320	0.0	0.0	0.0	0.0
224	0.0	1.495	4.604	0.0	0.0	0.0	0.0
225	0.0	1.588	4.657	0.0	0.0	0.0	0.0
226	0.0	1.680	4.710	0.0	0.0	0.0	0.0
227	0.0	1.772	4.763	0.0	0.0	0.0	0.0
228	0.0	1.864	4.817	0.0	0.0	0.0	0.0
229	0.0	1.956	4.870	0.0	0.0	0.0	0.0
230	0.0	0.407	4.120	0.0	0.0	0.0	0.0
231	0.0	0.457	4.120	0.0	0.0	0.0	0.0
232	0.0	0.507	4.120	0.0	0.0	0.0	0.0
233	0.0	0.558	4.120	0.0	0.0	0.0	0.0
234	0.0	0.608	4.120	0.0	0.0	0.0	0.0
235	0.0	0.658	4.120	0.0	0.0	0.0	0.0
236	0.0	1.668	4.304	0.0	0.0	0.0	0.0
237	0.0	1.761	4.357	0.0	0.0	0.0	0.0
238	0.0	1.853	4.410	0.0	0.0	0.0	0.0
239	0.0	1.945	4.463	0.0	0.0	0.0	0.0
240	0.0	2.038	4.517	0.0	0.0	0.0	0.0

NODAL POINT	TYPE	R-ORDINATE	Z-ORDINATE	R LOAD OR DISPLACEMENT	Z LOAD OR DISPLACEMENT	TEMPERATURE	PRESSURE
241	0.0	2.130	4.570	0.0	0.0	0.0	0.0
242	0.0	0.407	3.920	0.0	0.0	0.0	0.0
243	0.0	0.457	3.920	0.0	0.0	0.0	0.0
244	0.0	0.507	3.920	0.0	0.0	0.0	0.0
245	0.0	0.558	3.920	0.0	0.0	0.0	0.0
246	0.0	0.608	3.920	0.0	0.0	0.0	0.0
247	0.0	0.658	3.920	0.0	0.0	0.0	0.0
248	0.0	1.718	4.219	0.0	0.0	0.0	0.0
249	0.0	1.824	4.248	0.0	0.0	0.0	0.0
250	0.0	1.931	4.276	0.0	0.0	0.0	0.0
251	0.0	2.037	4.305	0.0	0.0	0.0	0.0
252	0.0	2.144	4.333	0.0	0.0	0.0	0.0
253	0.0	2.250	4.362	0.0	0.0	0.0	0.0
254	0.0	0.407	3.720	0.0	0.0	0.0	0.0
255	0.0	0.457	3.720	0.0	0.0	0.0	0.0
256	0.0	0.507	3.720	0.0	0.0	0.0	0.0
257	0.0	0.558	3.720	0.0	0.0	0.0	0.0
258	0.0	0.608	3.720	0.0	0.0	0.0	0.0
259	0.0	0.658	3.720	0.0	0.0	0.0	0.0
260	0.0	1.718	4.000	0.0	0.0	0.0	0.0
261	0.0	1.824	4.000	0.0	0.0	0.0	0.0
262	0.0	1.931	4.000	0.0	0.0	0.0	0.0
263	0.0	2.037	4.000	0.0	0.0	0.0	0.0
264	0.0	2.144	4.000	0.0	0.0	0.0	0.0
265	0.0	2.250	4.000	0.0	0.0	0.0	0.0
266	0.0	0.407	3.520	0.0	0.0	0.0	0.0
267	0.0	0.457	3.520	0.0	0.0	0.0	0.0
268	0.0	0.507	3.520	0.0	0.0	0.0	0.0
269	0.0	0.558	3.520	0.0	0.0	0.0	0.0
270	0.0	0.608	3.520	0.0	0.0	0.0	0.0
271	0.0	0.658	3.520	0.0	0.0	0.0	0.0
272	0.0	1.718	3.500	0.0	0.0	0.0	0.0
273	0.0	1.824	3.500	0.0	0.0	0.0	0.0
274	0.0	1.931	3.500	0.0	0.0	0.0	0.0
275	0.0	2.037	3.500	0.0	0.0	0.0	0.0
276	0.0	2.144	3.500	0.0	0.0	0.0	0.0
277	0.0	2.250	3.500	0.0	0.0	0.0	0.0
278	0.0	0.407	3.320	0.0	0.0	0.0	0.0
279	0.0	0.457	3.320	0.0	0.0	0.0	0.0
280	0.0	0.507	3.320	0.0	0.0	0.0	0.0

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NODAL POINT	TYPE	R-ORDINATE	Z-ORDINATE	R LOAD OR DISPLACEMENT	Z LOAD OR DISPLACEMENT	TEMPERATURE	PRESSURE
281	0.0	0.558	3.320	0.0	0.0	0.0	0.0
282	0.0	0.608	3.320	0.0	0.0	0.0	0.0
283	0.0	0.658	3.320	0.0	0.0	0.0	0.0
284	0.0	1.718	3.000	0.0	0.0	0.0	0.0
285	0.0	1.824	3.000	0.0	0.0	0.0	0.0
286	0.0	1.931	3.000	0.0	0.0	0.0	0.0
287	0.0	2.037	3.000	0.0	0.0	0.0	0.0
288	0.0	2.144	3.000	0.0	0.0	0.0	0.0
289	0.0	2.250	3.000	0.0	0.0	0.0	0.0
290	0.0	0.407	3.120	0.0	0.0	0.0	0.0
291	0.0	0.457	3.120	0.0	0.0	0.0	0.0
292	0.0	0.507	3.120	0.0	0.0	0.0	0.0
293	0.0	0.558	3.120	0.0	0.0	0.0	0.0
294	0.0	0.608	3.120	0.0	0.0	0.0	0.0
295	0.0	0.658	3.120	0.0	0.0	0.0	0.0
296	0.0	1.718	2.500	0.0	0.0	0.0	0.0
297	0.0	1.824	2.500	0.0	0.0	0.0	0.0
298	0.0	1.931	2.500	0.0	0.0	0.0	0.0
299	0.0	2.037	2.500	0.0	0.0	0.0	0.0
300	0.0	2.144	2.500	0.0	0.0	0.0	0.0
301	0.0	2.250	2.500	0.0	0.0	0.0	0.0
302	0.0	0.407	2.920	0.0	0.0	0.0	0.0
303	0.0	0.457	2.920	0.0	0.0	0.0	0.0
304	0.0	0.507	2.920	0.0	0.0	0.0	0.0
305	0.0	0.558	2.920	0.0	0.0	0.0	0.0
306	0.0	0.608	2.920	0.0	0.0	0.0	0.0
307	0.0	0.658	2.920	0.0	0.0	0.0	0.0
308	0.0	1.718	2.000	0.0	0.0	0.0	0.0
309	0.0	1.824	2.000	0.0	0.0	0.0	0.0
310	0.0	1.931	2.000	0.0	0.0	0.0	0.0
311	0.0	2.037	2.000	0.0	0.0	0.0	0.0
312	0.0	2.144	2.000	0.0	0.0	0.0	0.0
313	0.0	2.250	2.000	0.0	0.0	0.0	0.0
314	0.0	0.407	2.720	0.0	0.0	0.0	0.0
315	0.0	0.457	2.720	0.0	0.0	0.0	0.0
316	0.0	0.507	2.720	0.0	0.0	0.0	0.0
317	0.0	0.558	2.720	0.0	0.0	0.0	0.0
318	0.0	0.608	2.720	0.0	0.0	0.0	0.0
319	0.0	0.658	2.720	0.0	0.0	0.0	0.0
320	0.0	1.718	1.500	0.0	0.0	0.0	0.0

NODAL POINT	TYPE	R-ORDINATE	Z-ORDINATE	R LOAD OR DISPLACEMENT	Z LOAD OR DISPLACEMENT	TEMPERATURE	PRESSURE
321	0.0	1.824	1.500	0.0	0.0	0.0	0.0
322	0.0	1.931	1.500	0.0	0.0	0.0	0.0
323	0.0	2.037	1.500	0.0	0.0	0.0	0.0
324	0.0	2.144	1.500	0.0	0.0	0.0	0.0
325	0.0	2.250	1.500	0.0	0.0	0.0	0.0
326	0.0	0.407	2.520	0.0	0.0	0.0	0.0
327	0.0	0.457	2.520	0.0	0.0	0.0	0.0
328	0.0	0.507	2.520	0.0	0.0	0.0	0.0
329	0.0	0.558	2.520	0.0	0.0	0.0	0.0
330	0.0	0.608	2.520	0.0	0.0	0.0	0.0
331	0.0	0.658	2.520	0.0	0.0	0.0	0.0
332	0.0	1.718	1.000	0.0	0.0	0.0	0.0
333	0.0	1.824	1.000	0.0	0.0	0.0	0.0
334	0.0	1.931	1.000	0.0	0.0	0.0	0.0
335	0.0	2.037	1.000	0.0	0.0	0.0	0.0
336	0.0	2.144	1.000	0.0	0.0	0.0	0.0
337	0.0	2.250	1.000	0.0	0.0	0.0	0.0
338	0.0	0.407	2.320	0.0	0.0	0.0	0.0
339	0.0	0.457	2.320	0.0	0.0	0.0	0.0
340	0.0	0.507	2.320	0.0	0.0	0.0	0.0
341	0.0	0.558	2.320	0.0	0.0	0.0	0.0
342	0.0	0.608	2.320	0.0	0.0	0.0	0.0
343	0.0	0.658	2.320	0.0	0.0	0.0	0.0
344	0.0	1.718	0.500	0.0	0.0	0.0	0.0
345	0.0	1.824	0.500	0.0	0.0	0.0	0.0
346	0.0	1.931	0.500	0.0	0.0	0.0	0.0
347	0.0	2.037	0.500	0.0	0.0	0.0	0.0
348	0.0	2.144	0.500	0.0	0.0	0.0	0.0
349	0.0	2.250	0.500	0.0	0.0	0.0	0.0
350	0.0	0.407	2.120	0.0	0.0	0.0	0.0
351	0.0	0.457	2.120	0.0	0.0	0.0	0.0
352	0.0	0.507	2.120	0.0	0.0	0.0	0.0
353	0.0	0.558	2.120	0.0	0.0	0.0	0.0
354	0.0	0.608	2.120	0.0	0.0	0.0	0.0
355	0.0	0.658	2.120	0.0	0.0	0.0	0.0
356	2.00	1.718	0.0	0.0	0.0	0.0	0.0
357	2.00	1.824	0.0	0.0	0.0	0.0	0.0
358	2.00	1.931	0.0	0.0	0.0	0.0	0.0
359	2.00	2.037	0.0	0.0	0.0	0.0	0.0
360	2.00	2.144	0.0	0.0	0.0	0.0	0.0

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NODAL POINT	TYPE	R-ORDINATE	Z-ORDINATE	R LOAD OR DISPLACEMENT	Z LOAD OR DISPLACEMENT	TEMPERATURE	PRESSURE
361	2.00	2.250	C.C	C.0	0.0	0.0	C.0
362	0.0	0.407	1.920	C.C	C.0	0.0	0.0
363	0.0	0.457	1.920	0.0	C.0	0.0	C.0
364	C.0	0.507	1.92C	C.C	0.0	0.C	C.C
365	0.0	0.558	1.920	C.C	0.0	0.0	0.0
366	0.0	0.608	1.92C	0.0	C.0	C.C	C.0
367	0.C	0.658	1.920	C.0	0.0	C.0	C.C
368	0.0	0.407	1.72C	C.C	0.0	0.0	0.0
369	0.0	0.457	1.720	C.C	C.0	0.0	0.0
370	0.C	0.507	1.720	C.0	0.0	C.C	C.C
371	0.0	0.558	1.72C	C.C	0.0	0.0	C.0
372	0.0	0.608	1.720	C.C	C.0	0.0	C.0
373	0.0	0.658	1.720	C.0	0.0	C.0	C.0
374	C.C	0.407	1.52C	C.0	0.0	C.0	C.C
375	0.0	0.457	1.520	C.C	C.0	0.0	C.0
376	0.C	0.507	1.520	C.0	C.0	C.C	C.0
377	0.C	0.558	1.520	0.0	0.0	0.0	C.0
378	0.0	0.608	1.52C	C.C	0.0	0.0	C.0
379	0.0	0.658	1.520	0.C	C.0	0.0	0.0
380	0.C	0.407	1.320	0.0	0.0	C.0	C.0
381	0.0	0.457	1.32C	C.0	0.0	0.0	0.0
382	0.0	0.507	1.320	C.C	C.0	0.0	0.0
383	0.0	0.558	1.320	0.0	0.0	C.0	0.0
384	0.C	0.608	1.32C	C.0	0.0	0.0	C.0
385	0.0	0.658	1.320	C.0	0.0	0.0	C.0
386	0.C	0.407	1.120	0.C	C.0	0.0	0.0
387	0.C	0.457	1.120	0.0	0.0	0.0	C.0
388	0.0	0.507	1.12C	C.0	0.0	0.0	C.C
389	0.0	0.558	1.120	0.0	C.0	0.0	0.0
390	C.C	0.608	1.120	0.0	0.0	C.0	C.C
391	0.0	0.658	1.120	C.C	0.0	0.0	C.0
392	0.0	0.407	0.920	C.C	C.0	0.0	0.0
393	0.C	0.457	0.920	0.0	0.0	0.0	C.0
394	0.C	0.507	C.92C	0.0	0.0	0.0	C.C
395	0.0	0.558	0.920	C.0	0.0	0.0	0.0
396	0.C	0.608	0.920	0.0	0.0	0.C	C.0
397	0.0	0.658	0.920	0.0	0.0	0.0	C.0

CTIME= 0.00780 NUMBER OF NODES= 397

TIME= C.00833

TEMPERATURES
****

200.7595	201.4814	202.0468	202.4458	202.6740	202.7339	200.7570	201.4758	202.0388
202.4364	202.6639	202.7236	200.7570	201.4762	202.0401	202.4380	202.6659	202.7258
200.7573	201.4772	202.0412	202.4393	202.6672	202.7272	200.757C	201.4764	202.0401
202.4377	202.6654	202.7254	200.7564	201.4750	202.0379	202.4352	202.6625	202.7224
200.7567	201.4766	202.0409	202.4391	202.6671	202.7270	200.7552	201.4691	202.0288
202.4242	202.6512	202.7124	200.7704	201.5075	202.0837	202.4877	202.7143	202.7653
200.6766	201.3585	201.9764	202.4040	202.6794	202.8053	201.1857	201.2482	201.2115
201.0583	200.7816	200.3832	208.6357	216.5027	223.1301	228.5427	232.7599	235.8053
225.9036	219.7702	238.8772	255.3183	269.3054	280.9873	290.4766	286.5696	272.2559
230.1595	259.5002	284.9939	307.1052	326.1677	342.4253	350.4890	345.9182	329.8550
237.2275	273.1709	304.551C	332.0469	356.1406	377.1851	395.1804	405.8489	405.0625
390.5801	241.3029	280.9524	315.6636	346.2319	373.2356	397.1072	420.1826	442.8730
455.0376	455.1113	443.8149	243.3428	284.8950	321.3225	353.5007	382.061C	407.4688
432.1370	462.7385	483.6599	494.7505	496.1960	487.3569	244.1418	285.9448	322.6089

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569.3379	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
528.8535	566.0798	614.7461	633.1309	619.3154	611.0410	601.8518	597.7910	594.2974
588.0869	261.5586	319.7092	370.8401	416.4050	457.4485	494.7566	650.4353	643.0105
636.6958	629.4246	622.2456	613.9446	261.4722	319.6887	370.8850	416.5063	457.6106
494.9717	649.8635	650.4468	648.8206	646.2307	642.3655	636.9341	261.4805	319.6958
370.8875	416.5085	457.6042	494.9595	649.4441	649.1797	649.2056	648.9866	648.4792
647.5913	261.4802	319.6941	370.8853	416.5049	457.6025	494.9590	649.4270	649.0654
648.7327	648.5220	648.3865	648.2976	261.4797	319.6941	370.8867	416.5068	457.6023
494.9595	649.5076	649.1970	648.8923	648.5874	648.3113	648.0713	261.4805	319.6953
370.8865	416.5063	457.6030	494.9592	649.5176	649.2607	649.0178	648.7917	648.5823
648.3909	261.4800	319.6960	370.8911	416.5088	457.6057	494.9612	649.6011	649.4307
649.2776	649.1375	649.0112	648.8984	261.4812	319.6956	370.8855	416.5059	457.6038
494.9612	649.5964	649.4172	649.2527	649.1042	648.9712	648.8525	261.4810	319.6965
370.8894	416.5098	457.6060	494.9619	649.5898	649.4089	649.2434	649.0942	648.9617
648.8435	261.4795	319.6917	370.8845	416.5054	457.6016	494.9590	649.5886	649.4070
649.2407	649.0920	648.9600	648.8420	261.4802	319.6980	370.8896	416.5066	457.6030
494.9600	649.5867	649.4043	649.2388	649.0891	648.9548	648.8367	261.4805	319.6960
370.8884	416.5093	457.6067	494.9624	649.5874	649.4048	649.2371	649.0867	648.9536
648.8354	261.4805	319.6970	370.8882	416.5088	457.6045	494.9617	649.5894	649.4080
649.2432	649.0933	648.9604	648.8425	261.4807	319.6931	370.8884	416.5093	457.6047
494.9602	649.5862	649.4048	649.2397	649.0911	648.9578	648.8396	261.4805	319.6980
370.8867	416.5056	457.6040	494.9602	649.5757	649.3853	649.2141	649.0613	648.9270
648.8096	261.4817	319.6956	370.8892	416.5098	457.6057	494.9622	261.4805	319.6973
370.8889	416.5090	457.6050	494.9602	261.4802	319.6936	370.8877	416.5056	457.6028
494.9592	261.4805	319.6909	370.8828	416.5027	457.6021	494.9585	261.4802	319.6946
370.8835	416.5044	457.5996	494.9573	261.4649	319.7039	370.8970	416.5117	457.6040
494.9580								

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LTR . 4 38

N	R	Z	T
1	0.4075	9.1200	200.7595
2	0.4575	9.1200	201.4814
3	0.5075	9.1200	202.0468
4	0.5575	9.1200	202.4458
5	0.6075	9.1200	202.6740
6	0.6575	9.1200	202.7339
7	0.4075	8.9200	200.7570
8	0.4575	8.9200	201.4758
9	0.5075	8.9200	202.0388
10	0.5575	8.9200	202.4364
11	0.6075	8.9200	202.6639
12	0.6575	8.9200	202.7236
13	0.4075	8.7200	200.7570
14	0.4575	8.7200	201.4762
15	0.5075	8.7200	202.0401
16	0.5575	8.7200	202.4380
17	0.6075	8.7200	202.6659
18	0.6575	8.7200	202.7258
19	0.4075	8.5200	200.7573
20	0.4575	8.5200	201.4772
21	0.5075	8.5200	202.0412
22	0.5575	8.5200	202.4393
23	0.6075	8.5200	202.6672
24	0.6575	8.5200	202.7272
25	0.4075	8.3200	200.7570
26	0.4575	8.3200	201.4764
27	0.5075	8.3200	202.0401
28	0.5575	8.3200	202.4377
29	0.6075	8.3200	202.6654
30	0.6575	8.3200	202.7254
31	0.4075	8.1200	200.7564
32	0.4575	8.1200	201.4750
33	0.5075	8.1200	202.0379
34	0.5575	8.1200	202.4352
35	0.6075	8.1200	202.6625
36	0.6575	8.1200	202.7224
37	0.4075	7.9200	200.7567
38	0.4575	7.9200	201.4766
39	0.5075	7.9200	202.0409
40	0.5575	7.9200	202.4391

C-15

N	R	Z	T
41	0.6075	7.9200	202.6671
42	0.6575	7.9200	202.7270
43	0.4075	7.7200	200.7552
44	0.4575	7.7200	201.4691
45	0.5075	7.7200	202.0288
46	0.5575	7.7200	202.4242
47	0.6075	7.7200	202.6512
48	0.6575	7.7200	202.7124
49	0.4075	7.5200	200.7704
50	0.4575	7.5200	201.5075
51	0.5075	7.5200	202.0837
52	0.5575	7.5200	202.4877
53	0.6075	7.5200	202.7143
54	0.6575	7.5200	202.7653
55	0.4075	7.3200	200.6766
56	0.4575	7.3200	201.3985
57	0.5075	7.3200	201.9764
58	0.5575	7.3200	202.4040
59	0.6075	7.3200	202.6794
60	0.6575	7.3200	202.8053
61	0.4075	7.1200	201.1857
62	0.4575	7.1200	201.2482
63	0.5075	7.1200	201.2115
64	0.5575	7.1200	201.0583
65	0.6075	7.1200	200.7816
66	0.6575	7.1200	200.3832
67	0.4075	6.9200	208.6357
68	0.4575	6.9200	216.5027
69	0.5075	6.9200	223.1301
70	0.5575	6.9200	228.5427
71	0.6075	6.9200	232.7599
72	0.6575	6.9200	235.8053
73	0.7441	6.9700	225.9036
74	0.4075	6.7200	219.7702
75	0.4575	6.7200	238.8772
76	0.5075	6.7200	255.3183
77	0.5575	6.7200	269.3054
78	0.6075	6.7200	280.9873
79	0.6575	6.7200	290.4766
80	0.7385	6.7667	286.5696

C-16

N	R	Z	T
81	0.8307	6.8200	272.2559
82	0.4075	6.5200	230.1595
83	0.4575	6.5200	259.5002
84	0.5075	6.5200	284.9939
85	0.5575	6.5200	307.1052
86	0.6075	6.5200	326.1677
87	0.6575	6.5200	342.4253
88	0.7328	6.5635	350.4890
89	0.8249	6.6167	345.9182
90	0.9170	6.6700	329.8550
91	0.4075	6.3200	237.2275
92	0.4575	6.3200	273.1709
93	0.5075	6.3200	304.5510
94	0.5575	6.3200	332.0469
95	0.6075	6.3200	356.1406
96	0.6575	6.3200	377.1851
97	0.7272	6.3602	395.1804
98	0.8194	6.4135	405.8489
99	0.9117	6.4667	405.0625
100	1.0039	6.5200	390.5801
101	0.4075	6.1200	241.3029
102	0.4575	6.1200	280.9524
103	0.5075	6.1200	315.6636
104	0.5575	6.1200	346.2319
105	0.6075	6.1200	373.2356
106	0.6575	6.1200	397.1072
107	0.7216	6.1570	420.1826
108	0.8138	6.2102	442.8730
109	0.9060	6.2635	455.0376
110	0.9983	6.3167	455.1113
111	1.0905	6.3700	443.8149
112	0.4075	5.9200	243.3428
113	0.4575	5.9200	284.8950
114	0.5075	5.9200	321.3225
115	0.5575	5.9200	353.5007
116	0.6075	5.9200	382.0610
117	0.6575	5.9200	407.4688
118	0.7159	5.9537	432.1370
119	0.8081	6.0069	462.7385
120	0.9004	6.0602	483.6699

C-17

N	R	Z	T
121	0.9926	6.1134	494.7505
122	1.0849	6.1667	496.1960
123	1.1771	6.2200	487.3569
124	0.4075	5.7200	244.1418
125	0.4575	5.7200	285.9448
126	0.5075	5.7200	322.6089
127	0.5575	5.7200	355.0120
128	0.6075	5.7200	383.7964
129	0.6575	5.7200	409.4399
130	0.7441	5.7700	446.6504
131	0.8025	5.8037	469.2881
132	0.8947	5.8569	497.0178
133	0.9870	5.9102	516.0129
134	1.0792	5.9634	526.7056
135	1.1715	6.0167	528.9312
136	1.2637	6.0700	522.3645
137	0.4075	5.5200	247.8280
138	0.4575	5.5200	292.1069
139	0.5075	5.5200	330.9539
140	0.5575	5.5200	365.3450
141	0.6075	5.5200	395.9810
142	0.6575	5.5200	423.3923
143	0.7441	5.5700	455.5549
144	0.8307	5.6200	482.6243
145	0.8891	5.6537	497.0181
146	0.9814	5.7069	522.1321
147	1.0736	5.7602	539.9375
148	1.1659	5.8134	550.4351
149	1.2581	5.8667	553.6414
150	1.3504	5.9200	549.3511
151	0.4075	5.3200	258.3701
152	0.4575	5.3200	314.9807
153	0.5075	5.3200	364.8235
154	0.5575	5.3200	409.2988
155	0.6075	5.3200	449.4236
156	0.6575	5.3200	485.9565
157	0.7441	5.3700	515.0198
158	0.8307	5.4200	527.6431
159	0.9173	5.4700	539.9805
160	0.9757	5.5037	546.9407

N	R	Z	T
161	1.0679	5.5569	550.6316
162	1.1602	5.6102	561.5874
163	1.2524	5.6634	569.3379
164	1.3446	5.7167	571.9668
165	1.4369	5.7700	568.6348
166	0.4075	5.1200	261.9946
167	0.4575	5.1200	321.1501
168	0.5075	5.1200	373.1641
169	0.5575	5.1200	419.5137
170	0.6075	5.1200	461.2651
171	0.6575	5.1200	499.2153
172	0.7124	5.2250	528.8535
173	0.7677	5.3290	566.0798
174	0.8769	5.3400	614.7461
175	1.0038	5.3202	633.1309
176	1.0623	5.3537	619.3154
177	1.1545	5.4069	611.0410
178	1.2468	5.4602	601.8518
179	1.3390	5.5134	597.7910
180	1.4313	5.5667	594.2974
181	1.5235	5.6200	588.0869
182	0.4075	4.9200	261.5586
183	0.4575	4.9200	319.7092
184	0.5075	4.9200	370.8401
185	0.5575	4.9200	416.4050
186	0.6075	4.9200	457.4485
187	0.6575	4.9200	494.7566
188	1.1489	5.2037	650.4353
189	1.2412	5.2629	643.0105
190	1.3334	5.3222	636.6958
191	1.4257	5.3814	629.4246
192	1.5179	5.4407	622.2456
193	1.6102	5.5000	613.9446
194	0.4075	4.7200	261.4722
195	0.4575	4.7200	319.6887
196	0.5075	4.7200	370.8850
197	0.5575	4.7200	416.5063
198	0.6075	4.7200	457.6106
199	0.6575	4.7200	494.9717
200	1.2355	5.0537	649.8635

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N	R	Z	T
201	1.3278	5.1069	650.4468
202	1.4200	5.1602	648.8206
203	1.5122	5.2134	646.2307
204	1.6044	5.2667	642.3655
205	1.6967	5.3200	636.9341
206	0.4075	4.5200	261.4805
207	0.4575	4.5200	319.6958
208	0.5075	4.5200	370.8875
209	0.5575	4.5200	416.5085
210	0.6075	4.5200	457.6042
211	0.6575	4.5200	494.9595
212	1.3222	4.9037	649.4441
213	1.4144	4.9569	649.1797
214	1.5066	5.0102	649.2056
215	1.5989	5.0634	648.9866
216	1.69[illegible]	5.1167	648.4792
217	1.7833	5.1700	647.5913
218	0.4075	4.3200	261.4802
219	0.4575	4.3200	319.6941
220	0.5075	4.3200	370.8853
221	0.5575	4.3200	416.5049
222	0.6075	4.3200	457.6025
223	0.6575	4.3200	494.9590
224	1.4953	4.6037	649.4270
225	1.5876	4.6569	649.0654
226	1.6798	4.7102	648.7327
227	1.7720	4.7634	648.5220
228	1.8642	4.8167	648.3865
229	1.9565	4.8700	648.2976
230	0.4075	4.1200	261.4797
231	0.4575	4.1200	319.6941
232	0.5075	4.1200	370.8867
233	0.5575	4.1200	416.5068
234	0.6075	4.1200	457.6023
235	0.6575	4.1200	494.9595
236	1.6685	4.3037	649.5076
237	1.7607	4.3569	649.1970
238	1.8530	4.4102	648.8923
239	1.9452	4.4634	648.5874
240	2.0375	4.5167	648.3113

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N	R	Z	T
241	2.1298	4.5700	648.0713
242	0.4075	3.9200	261.4805
243	0.4575	3.9200	319.6953
244	0.5075	3.9200	370.8865
245	0.5575	3.9200	416.5063
246	0.6075	3.9200	457.6030
247	0.6575	3.9200	494.9592
248	1.7176	4.2190	649.5176
249	1.8240	4.2475	649.2607
250	1.9305	4.2761	649.0178
251	2.0370	4.3046	648.7917
252	2.1435	4.3332	648.5823
253	2.2500	4.3618	648.3909
254	0.4075	3.7200	261.4800
255	0.4575	3.7200	319.6960
256	0.5075	3.7200	370.8911
257	0.5575	3.7200	416.5088
258	0.6075	3.7200	457.6057
259	0.6575	3.7200	494.9612
260	1.7176	4.0000	649.6011
261	1.8240	4.0000	649.4307
262	1.9305	4.0000	649.2776
263	2.0370	4.0000	649.1375
264	2.1435	4.0000	649.0112
265	2.2500	4.0000	648.8984
266	0.4075	3.5200	261.4812
267	0.4575	3.5200	319.6956
268	0.5075	3.5200	370.8855
269	0.5575	3.5200	416.5059
270	0.6075	3.5200	457.6038
271	0.6575	3.5200	494.9612
272	1.7176	3.5000	649.5964
273	1.8240	3.5000	649.4172
274	1.9305	3.5000	649.2527
275	2.0370	3.5000	649.1042
276	2.1435	3.5000	648.9712
277	2.2500	3.5000	648.8525
278	0.4075	3.3200	261.4810
279	0.4575	3.3200	319.6965
280	0.5075	3.3200	370.8894

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LTR 11 44 38

N	R	Z	T
281	0.5575	3.3200	416.5098
282	0.6075	3.3200	457.6060
283	0.6575	3.3200	494.9619
284	1.7176	3.0000	649.5898
285	1.8240	3.0000	649.4089
286	1.9305	3.0000	649.2434
287	2.0370	3.0000	649.0942
288	2.1435	3.0000	648.9617
289	2.2500	3.0000	648.8435
290	0.4075	3.1200	261.4795
291	0.4575	3.1200	319.6917
292	0.5075	3.1200	370.8845
293	0.5575	3.1200	416.5054
294	0.6075	3.1200	457.6016
295	0.6575	3.1200	494.9590
296	1.7176	2.5000	649.5886
297	1.8240	2.5000	649.4070
298	1.9305	2.5000	649.2407
299	2.0370	2.5000	649.0920
300	2.1435	2.5000	648.9600
301	2.2500	2.5000	648.8420
302	0.4075	2.9200	261.4802
303	0.4575	2.9200	319.6980
304	0.5075	2.9200	370.8896
305	0.5575	2.9200	416.5066
306	0.6075	2.9200	457.6030
307	0.6575	2.9200	494.9600
308	1.7176	2.0000	649.5867
309	1.8240	2.0000	649.4043
310	1.9305	2.0000	649.2388
311	2.0370	2.0000	649.0891
312	2.1435	2.0000	648.9548
313	2.2500	2.0000	648.8367
314	0.4075	2.7200	261.4805
315	0.4575	2.7200	319.6960
316	0.5075	2.7200	370.8884
317	0.5575	2.7200	416.5093
318	0.6075	2.7200	457.6067
319	0.6575	2.7200	494.9624
320	1.7176	1.5000	649.5874

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N	R	Z	T
321	1.8240	1.5000	649.4048
322	1.9305	1.5000	649.2371
323	2.0370	1.5000	649.0867
324	2.1435	1.5000	648.9536
325	2.2500	1.5000	648.8354
326	0.4075	2.5200	261.4805
327	0.4575	2.5200	319.6970
328	0.5075	2.5200	370.8882
329	0.5575	2.5200	416.5088
330	0.6075	2.5200	457.6045
331	0.6575	2.5200	494.9617
332	1.7176	1.0000	649.5894
333	1.8240	1.0000	649.4080
334	1.9305	1.0000	649.2432
335	2.0370	1.0000	649.0933
336	2.1435	1.0000	648.9604
337	2.2500	1.0000	648.8425
338	0.4075	2.3200	261.4807
339	0.4575	2.3200	319.6931
340	0.5075	2.3200	370.8884
341	0.5575	2.3200	416.5093
342	0.6075	2.3200	457.6047
343	0.6575	2.3200	494.9602
344	1.7176	0.5000	649.5862
345	1.8240	0.5000	649.4048
346	1.9305	0.5000	649.2397
347	2.0370	0.5000	649.0911
348	2.1435	0.5000	648.9578
349	2.2500	0.5000	648.8396
350	0.4075	2.1200	261.4805
351	0.4575	2.1200	319.6980
352	0.5075	2.1200	370.8867
353	0.5575	2.1200	416.5056
354	0.6075	2.1200	457.6040
355	0.6575	2.1200	494.9602
356	1.7176	0.0	649.5757
357	1.8240	0.0	649.3853
358	1.9306	0.0	649.2141
359	2.0370	0.0	649.0613
360	2.1436	0.0	648.9270

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N	R	Z	T
361	2.2500	0.0	648.8096
362	0.4075	1.9200	261.4817
363	0.4575	1.9200	319.6956
364	0.5075	1.9200	370.8892
365	0.5575	1.9200	416.5098
366	0.6075	1.9200	457.6057
367	0.6575	1.9200	494.9622
368	0.4075	1.7200	261.4805
369	0.4575	1.7200	319.6973
370	0.5075	1.7200	370.8889
371	0.5575	1.7200	416.5090
372	0.6075	1.7200	457.6050
373	0.6575	1.7200	494.9602
374	0.4075	1.5200	261.4802
375	0.4575	1.5200	319.6936
376	0.5075	1.5200	370.8877
377	0.5575	1.5200	416.5056
378	0.6075	1.5200	457.6028
379	0.6575	1.5200	494.9592
380	0.4075	1.3200	261.4805
381	0.4575	1.3200	319.6909
382	0.5075	1.3200	370.8828
383	0.5575	1.3200	416.5027
384	0.6075	1.3200	457.6021
385	0.6575	1.3200	494.9585
386	0.4075	1.1200	261.4802
387	0.4575	1.1200	319.6946
388	0.5075	1.1200	370.8835
389	0.5575	1.1200	416.5044
390	0.6075	1.1200	457.5996
391	0.6575	1.1200	494.9573
392	0.4075	0.9200	261.4849
393	0.4575	0.9200	319.7039
394	0.5075	0.9200	370.8970
395	0.5575	0.9200	416.5117
396	0.6075	0.9200	457.6040
397	0.6575	0.9200	494.9580

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EL	I	J	K	L	MATERIAL	ANGLE	TEMPERATURE	PRESSURE
1	1	7	8	2	1	0.0	201.118	0.0
2	2	8	9	3	1	0.0	201.761	0.0
3	3	9	10	4	1	0.0	202.242	0.0
4	4	10	11	5	1	0.0	202.555	0.0
5	5	11	12	6	1	0.0	202.699	0.0
6	7	13	14	8	1	0.0	201.116	0.0
7	8	14	15	9	1	0.0	201.758	0.0
8	9	15	16	10	1	0.0	202.238	0.0
9	10	16	17	11	1	0.0	202.551	0.0
10	11	17	18	12	1	0.0	202.695	0.0
11	13	19	20	14	1	0.0	201.117	0.0
12	14	20	21	15	1	0.0	201.759	0.0
13	15	21	22	16	1	0.0	202.240	0.0
14	16	22	23	17	1	0.0	202.552	0.0
15	17	23	24	18	1	0.0	202.696	0.0
16	19	25	26	20	1	0.0	201.117	0.0
17	20	26	27	21	1	0.0	201.759	0.0
18	21	27	28	22	1	0.0	202.239	0.0
19	22	28	29	23	1	0.0	202.552	0.0
20	23	29	30	24	1	0.0	202.696	0.0
21	25	31	32	26	1	0.0	201.116	0.0
22	26	32	33	27	1	0.0	201.757	0.0
23	27	33	34	28	1	0.0	202.238	0.0
24	28	34	35	29	1	0.0	202.550	0.0
25	29	35	36	30	1	0.0	202.694	0.0
26	31	37	38	32	1	0.0	201.116	0.0
27	32	38	39	33	1	0.0	201.758	0.0
28	33	39	40	34	1	0.0	202.238	0.0
29	34	40	41	35	1	0.0	202.551	0.0
30	35	41	42	36	1	0.0	202.695	0.0
31	37	43	44	38	1	0.0	201.114	0.0
32	38	44	45	39	1	0.0	201.754	0.0
33	39	45	46	40	1	0.0	202.233	0.0
34	40	46	47	41	1	0.0	202.545	0.0
35	41	47	48	42	1	0.0	202.689	0.0
36	43	49	50	44	1	0.0	201.125	0.0
37	44	50	51	45	1	0.0	201.772	0.0
38	45	51	52	46	1	0.0	202.256	0.0
39	46	52	53	47	1	0.0	202.569	0.0
40	47	53	54	48	1	0.0	202.711	0.0

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EL	I	J	K	L	MATERIAL	ANGLE	TEMPERATURE	PRESSURE
41	49	55	56	50	1	0.0	201.088	0.0
42	50	56	57	51	1	0.0	201.741	0.0
43	51	57	58	52	1	0.0	202.238	0.0
44	52	58	59	53	1	0.0	202.571	0.0
45	53	59	60	54	1	0.0	202.741	0.0
46	55	61	62	56	1	0.0	201.127	0.0
47	56	62	63	57	1	0.0	201.459	0.0
48	57	63	64	58	1	0.0	201.662	0.0
49	58	64	65	59	1	0.0	201.731	0.0
50	59	65	66	60	1	0.0	201.662	0.0
51	61	67	68	62	1	0.0	206.893	0.0
52	62	68	69	63	1	0.0	210.523	0.0
53	63	69	70	64	1	0.0	213.486	0.0
54	64	70	71	65	1	0.0	215.786	0.0
55	65	71	72	66	1	0.0	217.432	0.0
56	66	72	73	73	1	0.0	221.999	0.0
57	67	74	75	68	1	0.0	220.946	0.0
58	68	75	76	69	1	0.0	233.457	0.0
59	69	76	77	70	1	0.0	244.074	0.0
60	70	77	78	71	1	0.0	252.899	0.0
61	71	78	79	72	1	0.0	260.007	0.0
62	72	79	80	80	1	0.0	274.855	0.0
63	72	80	73	73	1	0.0	243.545	0.0
64	73	80	81	81	1	0.0	264.246	0.0
65	74	82	83	75	1	0.0	237.077	0.0
66	75	83	84	76	1	0.0	259.672	0.0
67	76	84	85	77	1	0.0	279.181	0.0
68	77	85	86	78	1	0.0	295.891	0.0
69	78	86	87	79	1	0.0	310.014	0.0
70	79	87	88	88	1	0.0	333.470	0.0
71	79	88	80	80	1	0.0	303.526	0.0
72	80	88	89	89	1	0.0	332.224	0.0
73	80	89	90	81	1	0.0	308.650	0.0
74	82	91	92	83	1	0.0	250.015	0.0
75	83	92	93	84	1	0.0	280.554	0.0
76	84	93	94	85	1	0.0	307.174	0.0
77	85	94	95	86	1	0.0	330.365	0.0
78	86	95	96	87	1	0.0	350.479	0.0
79	87	96	97	97	1	0.0	377.493	0.0
80	87	97	88	88	1	0.0	359.646	0.0

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EL	I	J	K	L	MATERIAL	ANGLE	TEMPERATURE	PRESSURE
81	88	97	98	98	1	0.0	389.342	C.0
82	88	98	99	89	1	0.0	376.830	C.0
83	89	99	100	90	1	C.0	367.854	C.C
84	91	101	102	92	1	0.0	258.163	C.C
85	92	102	103	93	1	0.0	293.584	C.0
86	93	103	104	94	1	0.0	324.623	C.C
87	94	104	105	95	1	0.0	351.914	C.C
88	95	105	106	96	1	0.0	375.917	C.0
89	96	106	107	107	1	C.0	403.664	C.0
90	96	107	97	97	1	0.0	396.932	C.C
91	97	107	108	108	1	0.0	425.277	0.0
92	97	108	109	98	1	C.0	424.735	C.0
93	98	109	110	99	1	C.0	430.265	C.C
94	99	110	111	100	1	0.0	423.642	C.C
95	101	112	113	102	1	0.0	262.623	0.0
96	102	113	114	103	1	C.C	300.708	C.C
97	103	114	115	104	1	0.0	334.180	C.0
98	104	115	116	105	1	0.0	363.757	C.0
99	105	116	117	106	1	0.0	389.968	0.0
100	106	117	118	118	1	C.0	417.212	0.0
101	106	118	107	107	1	0.0	417.402	C.0
102	107	118	119	119	1	C.0	444.449	0.0
103	107	119	120	108	1	0.0	452.366	C.0
104	108	120	121	109	1	0.0	469.083	C.C
105	109	121	122	110	1	0.0	475.274	C.0
106	110	122	123	111	1	C.0	470.620	C.C
107	112	124	125	113	1	0.0	264.581	C.C
108	113	125	126	114	1	0.0	303.693	0.0
109	114	126	127	115	1	0.0	338.111	0.0
110	115	127	128	116	1	C.0	368.593	C.C
111	116	128	129	117	1	0.0	395.691	C.0
112	117	129	130	130	1	0.0	427.552	0.0
113	117	130	118	118	1	0.0	429.598	0.0
114	118	130	131	131	1	0.0	454.341	C.0
115	118	131	132	119	1	0.0	465.295	0.0
116	119	132	133	120	1	C.0	489.860	0.C
117	120	133	134	121	1	0.0	505.295	C.C
118	121	134	135	122	1	0.0	511.646	C.0
119	122	135	136	123	1	0.0	508.712	C.0
120	124	137	138	125	1	0.0	267.505	0.0

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EL	I	J	K	L	MATERIAL	ANGLE	TEMPERATURE	PRESSURE
121	125	138	139	126	1	0.0	307.904	0.0
122	126	139	140	127	1	0.0	343.480	0.0
123	127	140	141	128	1	0.0	375.033	0.0
124	128	141	142	129	1	0.0	403.152	0.0
125	129	142	143	143	1	0.0	435.985	0.0
126	129	143	130	130	1	0.0	439.574	0.0
127	130	143	144	144	1	0.0	466.863	0.0
128	130	144	145	131	1	0.0	473.895	0.0
129	131	145	146	132	1	0.0	496.364	0.0
130	132	146	147	133	1	0.0	518.775	0.0
131	133	147	148	134	1	0.0	533.273	0.0
132	134	148	149	135	1	0.0	539.928	0.0
133	135	149	150	136	1	0.0	538.572	0.0
134	137	151	152	138	1	0.0	278.321	0.0
135	138	152	153	139	1	0.0	325.716	0.0
136	139	153	154	140	1	0.0	367.605	0.0
137	140	154	155	141	1	0.0	405.012	0.0
138	141	155	156	142	1	0.0	438.688	0.0
139	142	156	157	157	1	0.0	484.847	0.0
140	142	157	143	143	1	0.0	462.380	0.0
141	143	157	158	158	1	0.0	506.465	0.0
142	143	158	144	144	1	0.0	487.112	0.0
143	144	158	159	159	1	0.0	522.557	0.0
144	144	159	145	145	1	0.0	504.160	0.0
145	145	159	160	160	1	0.0	532.720	0.0
146	145	160	161	146	1	0.0	529.180	0.0
147	146	161	162	147	1	0.0	543.572	0.0
148	147	162	163	148	1	0.0	555.324	0.0
149	148	163	164	149	1	0.0	561.345	0.0
150	149	164	165	150	1	0.0	560.898	0.0
151	151	166	167	152	1	0.0	289.124	0.0
152	152	167	168	153	1	0.0	343.530	0.0
153	153	168	169	1[illegible]	1	0.0	391.700	0.0
154	154	169	170	155	1	0.0	434.875	0.0
155	155	170	171	156	1	0.0	473.965	0.0
156	156	171	172	172	1	0.0	510.720	0.0
157	156	172	173	157	1	0.0	523.977	0.0
158	157	173	174	158	1	0.0	555.872	0.0
159	158	174	175	159	1	0.0	578.875	0.0
160	159	175	176	176	1	0.0	602.936	0.0

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LTR 1144 38

EL	I	J	K	L	MATERIAL	ANGLE	TEMPERATURE	PRESSURE
161	159	176	160	160	1	0.0	563.294	0.0
162	160	176	161	161	1	0.0	566.880	0.0
163	161	176	177	177	1	0.0	598.007	0.0
164	161	177	178	162	1	0.0	581.278	0.0
165	162	178	179	163	1	0.0	582.642	0.0
166	163	179	180	164	1	0.0	583.348	0.0
167	164	180	181	165	1	0.0	580.746	0.0
168	166	182	183	167	1	0.0	291.103	0.0
169	167	183	184	168	1	0.0	346.216	0.0
170	168	184	185	169	1	0.0	394.981	0.0
171	169	185	186	170	1	0.0	438.658	0.0
172	170	186	187	171	1	0.0	478.171	0.0
173	175	188	176	176	1	0.0	630.549	0.0
174	176	188	177	177	1	0.0	622.958	0.0
175	177	188	189	189	1	0.0	636.874	0.0
176	177	189	190	178	1	0.0	623.150	0.0
177	178	190	191	179	1	0.0	616.441	0.0
178	179	191	192	180	1	0.0	610.939	0.0
179	180	192	193	181	1	0.0	604.644	0.0
180	182	194	195	183	1	0.0	290.607	0.0
181	183	195	196	184	1	0.0	345.281	0.0
182	184	196	197	185	1	0.0	393.659	0.0
183	185	197	198	186	1	0.0	436.992	0.0
184	186	198	199	187	1	0.0	476.197	0.0
185	188	200	201	189	1	0.0	648.439	0.0
186	189	201	202	190	1	0.0	644.743	0.0
187	190	202	203	191	1	0.0	640.293	0.0
188	191	203	204	192	1	0.0	635.066	0.0
189	192	204	205	193	1	0.0	628.872	0.0
190	194	206	207	195	1	0.0	290.584	0.0
191	195	207	208	196	1	0.0	345.289	0.0
192	196	208	209	197	1	0.0	393.697	0.0
193	197	209	210	198	1	0.0	437.057	0.0
194	198	210	211	199	1	0.0	476.286	0.0
195	200	212	213	201	1	0.0	649.733	0.0
196	201	213	214	202	1	0.0	649.413	0.0
197	202	214	215	203	1	0.0	648.311	0.0
198	203	215	216	204	1	0.0	646.515	0.0
199	204	216	217	205	1	0.0	643.843	0.0
200	206	218	219	207	1	0.0	290.588	0.0

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LTR 1-44 38

EL	I	J	K	L	MATERIAL	ANGLE	TEMPERATURE	PRESSURE
201	207	219	220	208	1	0.0	345.291	C.0
202	208	220	221	209	1	0.0	393.697	C.0
203	209	221	222	210	1	0.0	437.055	C.0
204	210	222	223	211	1	C.C	476.281	C.C
205	212	224	225	213	1	0.0	649.279	C.C
206	213	225	226	214	1	0.0	649.046	C.0
207	214	226	227	215	1	0.C	648.862	C.C
208	215	227	228	216	1	0.0	648.594	C.C
209	216	228	229	217	1	0.0	648.188	C.0
210	218	230	231	219	1	0.0	290.587	C.0
211	219	231	232	220	1	0.0	345.290	C.C
212	220	232	233	221	1	0.0	393.696	C.0
213	221	233	234	222	1	0.0	437.054	C.C
214	222	234	235	223	1	C.C	476.281	C.0
215	224	236	237	225	1	0.0	649.299	C.C
216	225	237	238	226	1	0.0	648.972	C.0
217	226	238	239	227	1	0.0	648.684	C.C
218	227	239	240	228	1	0.0	648.452	C.C
219	228	240	241	229	1	0.0	648.267	C.0
220	230	242	243	231	1	C.0	290.587	0.0
221	231	243	244	232	1	0.C	345.291	C.0
222	232	244	245	233	1	0.0	393.697	0.0
223	233	245	246	234	1	0.0	437.054	C.0
224	234	246	247	235	1	0.0	476.281	C.0
225	236	248	249	237	1	0.0	649.371	C.C
226	237	249	250	238	1	0.0	649.092	0.0
227	238	250	251	239	1	C.0	648.822	C.0
228	239	251	252	240	1	0.0	648.568	C.C
229	240	252	253	241	1	0.0	648.339	0.0
230	242	254	255	243	1	C.C	290.588	0.0
231	243	255	256	244	1	0.0	345.292	0.0
232	244	256	257	245	1	0.0	393.698	C.0
233	245	257	258	246	1	0.0	437.056	C.0
234	246	258	259	247	1	0.0	476.282	C.0
235	248	260	261	249	1	0.0	649.452	C.C
236	249	261	262	250	1	0.0	649.247	0.0
237	250	262	263	251	1	C.0	649.056	C.0
238	251	263	264	252	1	0.0	648.881	C.0
239	252	264	265	253	1	0.0	648.721	C.0
240	254	266	267	255	1	0.0	290.588	C.0

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EL	I	J	K	L	MATERIAL	ANGLE	TEMPERATURE	PRESSURE
241	255	267	268	256	1	0.0	345.292	C.0
242	256	268	269	257	1	C.0	393.698	C.0
243	257	269	270	258	1	0.0	437.056	C.C
244	258	270	271	259	1	0.0	476.283	C.0
245	260	272	273	261	1	0.0	649.511	C.C
246	261	273	274	262	1	C.0	649.344	C.C
247	262	274	275	263	1	0.0	649.193	C.C
248	263	275	276	264	1	0.0	649.056	C.0
249	264	276	277	265	1	0.C	648.933	C.C
250	266	278	279	267	1	0.0	290.588	C.C
251	267	279	280	268	1	0.0	345.292	C.0
252	268	280	281	269	1	C.0	393.698	C.C
253	269	281	282	270	1	0.0	437.056	C.C
254	270	282	283	271	1	0.0	476.283	C.C
255	272	284	285	273	1	0.0	649.503	0.0
256	273	285	286	274	1	C.0	649.331	C.C
257	274	286	287	275	1	0.0	649.174	C.0
258	275	287	288	276	1	0.0	649.033	C.0
259	276	288	289	277	1	C.0	648.907	C.C
260	278	290	291	279	1	0.0	290.587	C.C
261	279	291	292	280	1	0.0	345.291	0.0
262	280	292	293	281	1	0.0	393.697	C.0
263	281	293	294	282	1	0.0	437.056	C.C
264	282	294	295	283	1	0.0	476.282	C.0
265	284	296	297	285	1	C.0	649.499	C.0
266	285	297	298	286	1	0.0	649.325	C.C
267	286	298	299	287	1	0.0	649.167	C.0
268	287	299	300	288	1	C.0	649.027	C.0
269	288	300	301	289	1	0.0	648.902	C.0
270	290	302	303	291	1	0.0	290.587	C.C
271	291	303	304	292	1	0.0	345.291	0.0
272	292	304	305	293	1	C.0	393.697	C.0
273	293	305	306	294	1	0.0	437.054	C.C
274	294	306	307	295	1	0.0	476.281	C.0
275	296	308	309	297	1	C.0	649.497	0.0
276	297	309	310	298	1	C.C	649.323	0.C
277	298	310	311	299	1	0.0	649.165	C.0
278	299	311	312	300	1	0.0	649.024	C.0
279	300	312	313	301	1	0.0	648.898	0.0
280	302	314	315	303	1	0.0	290.589	C.0

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EL	I	J	K	L	MATERIAL	ANGLE	TEMPERATURE	PRESSURE
281	303	315	316	304	1	0.0	345.293	0.0
282	304	316	317	305	1	0.0	393.698	0.0
283	305	317	318	306	1	0.0	437.056	0.0
284	306	318	319	307	1	0.0	476.283	0.0
285	308	320	321	309	1	0.0	649.496	0.0
286	309	321	322	310	1	0.0	649.321	0.0
287	310	322	323	311	1	0.0	649.163	0.0
288	311	323	324	312	1	0.0	649.021	0.0
289	312	324	325	313	1	0.0	648.895	0.0
290	314	326	327	315	1	0.0	290.588	0.0
291	315	327	328	316	1	0.0	345.292	0.0
292	316	328	329	317	1	0.0	393.698	0.0
293	317	329	330	318	1	0.0	437.057	0.0
294	318	330	331	319	1	0.0	476.284	0.0
295	320	332	333	321	1	0.0	649.497	0.0
296	321	333	334	322	1	0.0	649.323	0.0
297	322	334	335	323	1	0.0	649.165	0.0
298	323	335	336	324	1	0.0	649.023	0.0
299	324	336	337	325	1	0.0	648.898	0.0
300	326	338	339	327	1	0.0	290.588	0.0
301	327	339	340	328	1	0.0	345.292	0.0
302	328	340	341	329	1	0.0	393.698	0.0
303	329	341	342	330	1	0.0	437.057	0.0
304	330	342	343	331	1	0.0	476.283	0.0
305	332	344	345	333	1	0.0	649.497	0.0
306	333	345	346	334	1	0.0	649.324	0.0
307	334	346	347	335	1	0.0	649.167	0.0
308	335	347	348	336	1	0.0	649.026	0.0
309	336	348	349	337	1	0.0	648.900	0.0
310	338	350	351	339	1	0.0	290.588	0.0
311	339	351	352	340	1	0.0	345.292	0.0
312	340	352	353	341	1	0.0	393.698	0.0
313	341	353	35	342	1	0.0	437.056	0.0
314	342	354	355	343	1	0.0	476.282	0.0
315	344	356	357	345	1	0.0	649.488	0.0
316	345	357	358	346	1	0.0	649.311	0.0
317	346	358	359	347	1	0.0	649.151	0.0
318	347	359	360	348	1	0.0	649.009	0.0
319	348	360	361	349	1	0.0	648.883	0.0
320	350	362	363	351	1	0.0	290.589	0.0

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LTR 1-44 38

EL	I	J	K	L	MATERIAL	ANGLE	TEMPERATURE	PRESSURE
321	351	363	364	352	1	0.0	345.292	0.0
322	352	364	365	353	1	0.0	393.698	0.0
323	353	365	366	354	1	0.0	437.056	0.0
324	354	366	367	355	1	0.0	476.283	0.0
325	362	368	369	363	1	0.0	290.589	0.0
326	363	369	370	364	1	0.0	345.293	0.0
327	364	370	371	365	1	0.0	393.699	0.0
328	365	371	372	366	1	0.0	437.057	0.0
329	366	372	373	367	1	0.0	476.283	0.0
330	368	374	375	369	1	0.0	290.588	0.0
331	369	375	376	370	1	0.0	345.292	0.0
332	370	376	377	371	1	0.0	393.698	0.0
333	371	377	378	372	1	0.0	437.055	0.0
334	372	378	379	373	1	0.0	476.282	0.0
335	374	380	381	375	1	0.0	290.586	0.0
336	375	381	382	376	1	0.0	345.289	0.0
337	376	382	383	377	1	0.0	393.695	0.0
338	377	383	384	378	1	0.0	437.053	0.0
339	378	384	385	379	1	0.0	476.281	0.0
340	380	386	387	381	1	0.0	290.586	0.0
341	381	387	388	382	1	0.0	345.288	0.0
342	382	388	389	383	1	0.0	393.693	0.0
343	383	389	390	384	1	0.0	437.052	0.0
344	384	390	391	385	1	0.0	476.279	0.0
345	386	392	393	387	1	0.0	290.591	0.0
346	387	393	394	388	1	0.0	345.295	0.0
347	388	394	395	389	1	0.0	393.699	0.0
348	389	395	396	390	1	0.0	437.055	0.0
349	390	396	397	391	1	0.0	476.280	0.0

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****
THE MAXIMUM NODE DIFFERENCE OF (17) OCCURS AT ELEMENT # 172.
****

*****
TIME REMAINING, 105 SECONDS
*****

ELEMENT PLOTTING OCCURS HERE.

*****
TIME REMAINING, 96 SECONDS
*****

LTR 1 4 4 38

MATERIAL = 1 NO. OF TEMPERATURES AT WHICH PROPERTIES ARE SPECIFIED = 7
MASS DENSITY = 0.0 POROSITY = 0.0
ANISOTROPY PARAMETER = 2

TEMP= 0.
TENSILE PROPERTIES
EMT= 2830CCCO. ENT= 283CCCCO. ETT= 283CCCCO. NUMNT=0.0 NUMTT=0.0 NUNTT=0.0 EPT= 283CCCCO.
COMPRESSIVE PROPERTIES
EMC= 28300000. ENC= 283CCCOO. ETC= 283CCCCO. NUMNC=C.C NUMTC=C.0 NUNTC=0.C EPC= 28300COO.
THERMAL AND YIELD PROPERTIES
AM= 0.524E-05 AN= C.524E-05 AT= C.524E-05 YM= 0. YN= 0. YT= 0. PEMR= 0.0

TEMP= 200.
TENSILE PROPERTIES
EMT= 277CCCCO. ENT= 277CCCOO. ETT= 277CCCCO. NUMNT=0.0 NUMTT=0.0 NUNTT=0.0 EPT= 2770CCCC.
COMPRESSIVE PROPERTIES
EMC= 2770C0C0. ENC= 277CCCOO. ETC= 277CCCOO. NUMNC=0.0 NUMTC=0.0 NUNTC=0.C EPC= 27700CCC.
THERMAL AND YIELD PROPERTIES
AM= 0.572E-05 AN= C.572E-05 AT= 0.572E-05 YM= C. YN= C. YT= 0. PEMR= 0.0

TEMP= 300.
TENSILE PROPERTIES
EMT= 2710CCCO. ENT= 271CCCOO. ETT= 271CCCCO. NUMNT=C.C NUMTT=0.0 NUNTT=0.0 EPT= 27100000.
COMPRESSIVE PROPERTIES
EMC= 2710CCCO. ENC= 271CCCOO. ETC= 271CCOOO. NUMNC=0.0 NUMTC=0.0 NUNTC=0.0 EPC= 2710CCOO.
THERMAL AND YIELD PROPERTIES
AM= 0.605E-05 AN= 0.605E-05 AT= 0.605E-05 YM= 0. YN= C. YT= 0. PEMR= 0.0

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TEMP= 400.
TENSILE PROPERTIES
EMT= 2660CCCO. ENT= 266CCCOO. ETT= 266CCCOO. NUMNT=0.0 NUMTT=C.C NUNTT=0.C EPT= 26600000.
COMPRESSIVE PROPERTIES
EMC= 2660CCCO. ENC= 266CCCCO. ETC= 266CCCCC. NUMNC=0.C NUMTC=C.0 NUNTC=0.0 EPC= 26600CCO.
THERMAL AND YIELD PROPERTIES
AM= 0.636E-05 AN= C.636E-05 AT= C.636E-05 YM= 0. YN= 0. YT= C. PEMR= C.0

TEMP= 500.
TENSILE PROPERTIES
EMT= 2610CCCO. ENT= 261CCCCO. ETT= 261C0000. NUMNT=0.0 NUMTT=C.0 NUNTT=0.C EPT= 2610CCCC.
COMPRESSIVE PROPERTIES
EMC= 26100000. ENC= 26100COO. ETC= 261CCCCO. NUMNC=C.C NUMTC=C.0 NUNTC=0.C EPC= 26100000.
THERMAL AND YIELD PROPERTIES
AM= 0.666E-05 AN= C.666E-05 AT= C.666E-05 YM= 0. YN= 0. YT= 0. PEMR= 0.0

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TEMP= 600.
TENSILE PROPERTIES
EMT= 2540CCCO. ENT= 254CCCOO. ETT= 254CCCCO. NUMNT=0.0 NUMTT=0.0 NUNTT=0.0 EPT= 254C0000.
COMPRESSIVE PROPERTIES
EMC= 2540CCCO. ENC= 254C0000. ETC= 254CCCOO. NUMNC=0.0 NUMTC=0.0 NUNTC=0.C EPC= 254CCCCO.
THERMAL AND YIELD PROPERTIES
AM= 0.694E-05 AN= C.694E-05 AT= 0.694E-05 YM= C. YN= 0. YT= 0. PEMR= 0.0

TEMP= 700.
TENSILE PROPERTIES
EMT= 2480CCCO. ENT= 248CCCOC. ETT= 248CCCCO. NUMNT=0.C NUMTT=0.0 NUNTT=0.0 EPT= 24800000.
COMPRESSIVE PROPERTIES
EMC= 2480CCCO. ENC= 248CCCOC. ETC= 248CCCOO. NUMNC=0.0 NUMTC=0.0 NUNTC=0.C EPC= 24800COO.
THERMAL AND YIELD PROPERTIES
AM= 0.708E-05 AN= 0.708E-05 AT= 0.708E-05 YM= 0. YN= C. YT= 0. PEMR= 0.0

PRESSURE BOUNDARY CONDITIONS

I	J	INTENSITY
1	7	2 0
7	13	2280.0
13	19	2280.0
19	25	2280.0
25	31	2280.0
31	37	2280.0
37	43	2280.0
43	49	2280.0
49	55	2280.0
55	61	2280.0
61	67	2280.0
67	74	2280.0
74	82	2280.0
82	91	2280.0
91	101	2280.0
101	112	2280.0
112	124	2280.0
124	137	2280.0
137	151	2280.0
151	166	2280.0
166	182	2280.0
182	194	2280.0
194	206	2280.0
206	218	2280.0
218	230	2280.0
230	242	2280.0
242	254	2280.0
254	266	2280.0
266	278	2280.0
278	290	2280.0
290	302	2280.0
302	314	2280.0
314	326	2280.0
326	338	2280.0
338	350	2280.0
350	362	2280.0
362	368	2280.0
368	374	2280.0
374	380	2280.0
380	386	2280.0
386	392	2280.0
171	172	2250.0
172	173	2250.0
173	174	2250.0
174	188	2250.0
188	200	2250.0
200	212	2250.0
212	224	2250.0
224	236	2250.0
236	248	2250.0
248	260	2250.0
260	272	2250.0
272	284	2250.0
284	296	2250.0
296	308	2250.0
308	320	2250.0
320	332	2250.0
332	344	2250.0
344	356	2250.0
171	187	2250.0
187	199	2250.0
199	211	2250.0

211	223	2250.0
223	235	2250.0
235	247	2250.0
247	259	2250.0
259	271	2250.0
271	283	2250.0
283	295	2250.0
295	307	2250.0
307	319	2250.0
319	331	2250.0
331	343	2250.0
343	355	2250.0
355	367	2250.0
367	373	2250.0
373	379	2250.0
379	385	2250.0
385	391	2250.0
391	397	2250.0

*****
* TIME REMAINING AT BEGINNING OF SOLUTION IS 96 SECONDS.
*****

NODAL POINT	UR	UZ
1	0.3822387D-03	0.2608009D-01
2	0.4163501D-03	0.2608053D-01
3	0.4519277D-03	0.2608111D-01
4	0.4884840D-03	0.2608169D-01
5	0.5257794D-03	0.2608220D-01
6	0.5635959D-03	0.2608266D-01
7	0.3836924D-03	0.2592927D-01
8	0.4178569D-03	0.2592956D-01
9	0.4534064D-03	0.2592987D-01
10	0.4899499D-03	0.2593018D-01
11	0.5272203D-03	0.2593049D-01
12	0.5650239D-03	0.2593078D-01
13	0.3844996D-03	0.2577823D-01
14	0.4186621D-03	0.2577842D-01
15	0.4542137D-03	0.2577863D-01
16	0.4907674D-03	0.2577885D-01
17	0.5280496D-03	0.2577906D-01
18	0.5658583D-03	0.2577926D-01
19	0.3852718D-03	0.2562689D-01
20	0.4194382D-03	0.2562709D-01
21	0.4549958D-03	0.2562727D-01
22	0.4915528D-03	0.2562744D-01
23	0.5288344D-03	0.2562762D-01
24	0.5666420D-03	0.2562782D-01
25	0.3861312D-03	0.2547594D-01
26	0.4203008D-03	0.2547602D-01
27	0.4558638D-03	0.2547601D-01
28	0.4924237D-03	0.2547597D-01
29	0.5297066D-03	0.2547598D-01
30	0.5675146D-03	0.2547606D-01
31	0.3859967D-03	0.2532641D-01
32	0.4201653D-03	0.2532588D-01
33	0.4557270D-03	0.2532519D-01
34	0.4922886D-03	0.2532445D-01
35	0.5295734D-03	0.2532378D-01
36	0.5673823D-03	0.2532326D-01
37	0.3820338D-03	0.2517911D-01
38	0.4161858D-03	0.2517707D-01
39	0.4517152D-03	0.2517487D-01
40	0.4882535D-03	0.2517261D-01

NODAL POINT	UR	UZ
41	0.5255342D-03	0.2517C40D-01
42	0.5633442D-03	0.2516834D-01
43	0.3696174D-03	0.2503386D-01
44	0.4037292D-03	0.25C2934D-01
45	0.4391886D-03	0.2502496D-01
46	0.4756813D-03	0.2502061D-01
47	C.5129415D-03	0.25C1622D-01
48	0.5507549D-03	C.25C1168D-C1
49	0.3453188D-03	0.2488572D-01
50	C.3793755D-03	0.2487947D-01
51	0.4147719D-03	C.2487431D-01
52	0.4513106D-03	0.2486931D-01
53	0.4887232D-03	0.2486375D-01
54	0.5265822D-03	0.2485727D-01
55	0.3183702D-03	0.2471996D-01
56	0.3521C69D-03	0.2471822D-01
57	C.3867592D-03	0.24719C3D-01
58	0.4223253D-03	0.2472047D-01
59	0.4589154D-03	0.2472040D-01
60	0.4967629D-03	0.2471588D-01
61	0.3275C05D-03	0.2451951D-01
62	0.3615280D-03	0.2453364D-01
63	0.3959C06D-03	0.2455138D-01
64	C.43C2673D-03	0.2457207D-01
65	0.4643884D-03	0.2459532D-01
66	0.4981833D-03	0.2462109D-01
67	0.4178651D-03	0.2428153D-01
68	0.4558C39D-03	0.2431449D-01
69	0.4973039D-03	0.2435144D-01
70	0.5415CCCD-03	0.2439286D-01
71	0.5877557D-03	0.2443952D-01
72	0.6355766D-03	0.2449268D-01
73	0.6661418D-03	0.2463488D-01
74	C.5684971D-03	0.24CC668D-01
75	0.6122041D-03	0.2405090D-01
76	0.6638217D-03	0.24C9971D-01
77	0.7215820D-03	0.2415328D-01
78	0.7840955D-03	0.2421189D-01
79	0.8501420D-03	0.2427579D-01
80	0.8996919D-03	0.2444842D-01

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NODAL POINT	UR	UZ
81	0.94C9672D-03	0.2465C01D-01
82	C.7473C31D-03	0.2368SC6D-01
83	0.7966672D-03	0.2373747D-01
84	0.8582876D-03	0.2379021D-01
85	C.9254917D-03	0.2384731D-01
86	0.1008290D-02	0.239C890D-01
87	0.1093151D-02	0.2397522D-01
88	0.1171C85D-02	0.2415679D-01
89	0.1253472D-02	0.2438886D-01
90	0.1309920D-02	0.2464483D-01
91	C.9348306D-03	0.2333185D-01
92	0.9886347D-03	0.2338C16D-01
93	0.1058415D-02	0.2343150D-01
94	0.1140641D-02	0.2348613D-01
95	0.1232765D-02	0.2354432D-01
96	0.1332902D-02	0.2360632D-01
97	0.1433422D-02	0.2377976D-01
98	0.1561422D-02	0.24C2402D-01
99	0.1675280D-02	0.2429C81D-01
100	0.1764808D-02	0.2458061D-01
101	0.1119738D-02	0.2294948D-01
102	0.1176608D-02	0.2299456D-01
103	0.1252326D-02	0.2304042D-01
104	0.1342594D-02	0.2308779D-01
105	0.1444403D-02	0.2313735D-01
106	0.1555514D-02	0.2318970D-01
107	0.1668642D-02	0.2334336D-01
108	C.1833630D-02	0.2358323D-01
109	0.1993975D-02	0.2384665D-01
110	0.2142116D-02	0.2413265D-01
111	C.2268205D-02	0.2444122D-01
112	0.1290375D-02	0.2256661D-01
113	0.1349256D-02	0.2260360D-01
114	0.1429225D-02	0.2263847D-01
115	0.1525480D-02	0.2267280D-01
116	0.1634690D-02	0.2270785D-01
117	0.1754388D-02	0.2274454D-01
118	0.1872633D-02	0.2287C59D-01
119	0.2066532D-02	0.2309222D-01
120	0.2261640D-02	0.2334045D-01

NODAL POINT	UR	UZ
121	0.2452772D-02	0.2361443D-01
122	0.2632595D-02	0.2391181D-01
123	0.2794188D-02	0.2422858D-01
124	0.1418456D-02	0.2221397D-01
125	0.1478924D-02	0.2223276D-01
126	0.1562605D-02	0.2224843D-01
127	0.1664535D-02	0.2226283D-01
128	0.1781105D-02	0.2227734D-01
129	0.1909500D-02	0.2229307D-01
130	0.2118768D-02	0.2244876D-01
131	0.2259768D-02	0.2257209D-01
132	0.2485204D-02	0.2279290D-01
133	0.2709565D-02	0.2304640D-01
134	0.2927441D-02	0.2332821D-01
135	0.3134433D-02	0.2363318D-01
136	0.3326477D-02	0.2395488D-01
137	0.1444531D-02	0.2189735D-01
138	0.1507868D-02	0.2188606D-01
139	0.1597155D-02	0.2187590D-01
140	0.1707704D-02	0.2186592D-01
141	0.1835760D-02	0.2185554D-01
142	0.1978356D-02	0.2184475D-01
143	0.2137310D-02	0.2183392D-01
144	0.2493067D-02	0.2210199D-01
145	0.2663068D-02	0.2222207D-01
146	0.2922418D-02	0.2244619D-01
147	0.3174778D-02	0.2270637D-01
148	0.3417189D-02	0.2299578D-01
149	0.3646524D-02	0.2330816D-01
150	0.3861058D-02	0.2363621D-01
151	0.1323021D-02	0.2155545D-01
152	0.1389248D-02	0.2151697D-01
153	0.1482213D-02	0.2148430D-01
154	0.1597153D-02	0.2145227D-01
155	0.1730773D-02	0.2141670D-01
156	0.1880596D-02	0.2137387D-01
157	0.2220101D-02	0.2142450D-01
158	0.2562467D-02	0.2152065D-01
159	0.2880705D-02	0.2167657D-01
160	0.3082908D-02	0.2181012D-01

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NODAL POINT	UR	UZ
161	0.3381C09D-02	0.2205733D-01
162	C.3664738D-02	0.2233C51D-01
163	0.3931319D-02	0.2262988D-01
164	0.4180C62D-02	0.2295C87D-01
165	0.4409414D-02	0.2329035D-01
166	0.1131C51D-02	0.2112367D-01
167	0.1196602D-02	0.21C8642D-01
168	0.1284865D-02	0.21C5112D-01
169	0.1390750D-02	0.2101415D-01
170	0.1510642D-02	0.2097145D-01
171	0.1641990D-02	0.2091739D-01
172	0.1927869D-02	0.2106948D-01
173	0.2256842D-02	0.2127023D-01
174	0.2757654D-02	0.2123628D-01
175	0.3355720D-02	0.2115589D-01
176	0.3575541D-02	0.2132878D-01
177	0.3896178D-02	0.2161773D-01
178	0.4199435D-02	0.2191913D-01
179	0.4484710D-02	0.2223414D-01
180	0.4751187D-02	0.2256592D-01
181	0.4994628D-02	0.2291881D-01
182	0.1028135D-02	0.2064715D-01
183	0.1093845D-02	0.2063158D-01
184	0.1182901D-02	0.2061399D-01
185	0.1291067D-02	0.2059592D-01
186	0.1415734D-02	0.2057925D-01
187	0.1555692D-02	0.2056760D-01
188	0.4170420D-02	0.2082177D-01
189	0.4469577D-02	0.2116921D-01
190	0.4760958D-02	0.2151659D-01
191	0.5044677D-02	0.2186785D-01
192	0.5313898D-02	0.2223252D-01
193	0.5563423D-02	0.2261877D-01
194	0.1007911D-02	0.2019273D-01
195	0.1073621D-02	0.2019120D-01
196	0.1162974D-02	0.2018793D-01
197	0.1271792D-02	0.2018428D-01
198	0.1396916D-02	0.2018135D-01
199	0.1535725D-02	0.2017961D-01
200	0.4767221D-02	0.2032955D-01

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NODAL POINT	UR	UZ
201	0.5061788D-02	0.2066777D-01
202	0.5365296D-02	0.2099519D-01
203	0.5667917D-02	0.2132474D-01
204	0.5965037D-02	0.2166241D-01
205	0.6249744D-02	0.2201488D-01
206	0.1016531D-02	0.1976369D-01
207	0.1082226D-02	0.1976612D-01
208	0.1171485D-02	0.1976781D-01
209	0.1280111D-02	0.1976925D-01
210	0.1405014D-02	0.1977095D-01
211	0.1543949D-02	0.1977347D-01
212	0.5307685D-02	0.1986604D-01
213	0.5614200D-02	0.2018313D-01
214	0.5923358D-02	0.2050002D-01
215	0.6234369D-02	0.2081890D-01
216	0.6545173D-02	0.2114153D-01
217	0.6855358D-02	0.2146567D-01
218	0.1028309D-02	0.1934584D-01
219	0.1094049D-02	0.1934818D-01
220	0.1183391D-02	0.1935034D-01
221	0.1292088D-02	0.1935245D-01
222	0.1417047D-02	0.1935467D-01
223	0.1555969D-02	0.1935708D-01
224	0.6272508D-02	0.1887522D-01
225	0.6598509D-02	0.1915859D-01
226	0.6925695D-02	0.1944512D-01
227	0.7254330D-02	0.1973279D-01
228	0.7584682D-02	0.2002082D-01
229	0.7916769D-02	0.2030808D-01
230	0.1035756D-02	0.1893122D-01
231	0.1101524D-02	0.1893251D-01
232	0.1190919D-02	0.1893385D-01
233	0.1299654D-02	0.1893520D-01
234	0.1424619D-02	0.1893654D-01
235	0.1563544D-02	0.1893786D-01
236	0.7127595D-02	0.1779709D-01
237	0.7468758D-02	0.1805486D-01
238	0.7810341D-02	0.1831627D-01
239	0.8152858D-02	0.1857982D-01
240	0.8497130D-02	0.1884328D-01

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NODAL POINT	UR	UZ
241	0.8844436D-02	0.1910378D-01
242	0.1038805D-02	0.1851661D-01
243	0.1104584D-02	0.1851706D-01
244	0.1193997D-02	0.1851760D-01
245	0.1302744D-02	0.1851816D-01
246	0.1427712D-02	0.1851869D-01
247	0.1566634D-02	0.1851914D-01
248	0.7352682D-02	0.1747804D-01
249	0.7765764D-02	0.1763341D-01
250	0.8179669D-02	0.1779207D-01
251	0.8595469D-02	0.1795095D-01
252	0.9013630D-02	0.1810876D-01
253	0.9434497D-02	0.1826526D-01
254	0.1039395D-02	0.1810071D-01
255	0.1105177D-02	0.1810076D-01
256	0.1194595D-02	0.1810085D-01
257	0.1303345D-02	0.1810096D-01
258	0.1428313D-02	0.1810105D-01
259	0.1567235D-02	0.1810109D-01
260	0.7423046D-02	0.1658786D-01
261	0.7847408D-02	0.1661605D-01
262	0.8273755D-02	0.1664555D-01
263	0.8701771D-02	0.1667555D-01
264	0.9131391D-02	0.1670563D-01
265	0.9562569D-02	0.1673592D-01
266	0.1039107D-02	0.1768405D-01
267	0.1104888D-02	0.1768397D-01
268	0.1194305D-02	0.1768391D-01
269	0.1303052D-02	0.1768386D-01
270	0.1428020D-02	0.1768380D-01
271	0.1566942D-02	0.1768371D-01
272	0.7527011D-02	0.1453954D-01
273	0.7951352D-02	0.1455535D-01
274	0.8377961D-02	0.1457149D-01
275	0.8806477D-02	0.1458779D-01
276	0.9236593D-02	0.1460398D-01
277	0.9668058D-02	0.1461965D-01
278	0.1038717D-02	0.1726729D-01
279	0.1104496D-02	0.1726721D-01
280	0.1193910D-02	0.1726713D-01

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NODAL POINT	UR	UZ
281	0.1302656D-02	0.1726705D-01
282	0.1427623D-02	0.1726697D-01
283	0.1566545D-02	0.1726688D-01
284	0.7570862D-02	0.1248290D-01
285	0.7995193D-02	0.1248831D-01
286	0.8421743D-02	0.1249442D-01
287	0.8850165D-02	0.1250071D-01
288	0.9280176D-02	0.1250675D-01
289	0.9711567D-02	0.1251210D-01
290	0.1038431D-02	0.1685023D-01
291	0.1104209D-02	0.1685016D-01
292	0.1193621D-02	0.1685008D-01
293	0.1302365D-02	0.1685000D-01
294	0.1427331D-02	0.1684993D-01
295	0.1566252D-02	0.1684985D-01
296	0.7579245D-02	0.1041368D-01
297	0.8003588D-02	0.1041387D-01
298	0.8430165D-02	0.1041453D-01
299	0.8858599D-02	0.1041533D-01
300	0.9288606D-02	0.1041596D-01
301	0.9719994D-02	0.1041613D-01
302	0.1038157D-02	0.1643322D-01
303	0.1103934D-02	0.1643313D-01
304	0.1193344D-02	0.1643304D-01
305	0.1302087D-02	0.1643295D-01
306	0.1427053D-02	0.1643286D-01
307	0.1565974D-02	0.1643277D-01
308	0.7573366D-02	0.8335941D-02
309	0.7997702D-02	0.8334386D-02
310	0.8424269D-02	0.8333064D-02
311	0.8852697D-02	0.8331809D-02
312	0.9282702D-02	0.8330468D-02
313	0.9714085D-02	0.8328892D-02
314	0.1037733D-02	0.1601649D-01
315	0.1103508D-02	0.1601636D-01
316	0.1192916D-02	0.1601626D-01
317	0.1301658D-02	0.1601615D-01
318	0.1426625D-02	0.1601604D-01
319	0.1565547D-02	0.1601591D-01
320	0.7564940D-02	0.8253079D-02

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NODAL POINT	UR	UZ
321	0.7989271D-02	0.6251499D-02
322	0.8415827D-02	0.6249995D-02
323	0.8844246D-02	0.6248512D-02
324	0.9274249D-02	0.6247001D-02
325	0.9705633D-02	0.6245413D-02
326	0.1037167D-02	0.1559931D-01
327	0.1102940D-02	0.1559922D-01
328	0.1192344D-02	0.1559917D-01
329	0.1301083D-02	0.1559912D-01
330	0.1426049D-02	0.1559906D-01
331	0.1564970D-02	0.1559896D-01
332	0.7558586D-02	0.4168743D-02
333	0.7982913D-02	0.4167700D-02
334	0.8409462D-02	0.4166660D-02
335	0.8837878D-02	0.4165620D-02
336	0.9267685D-02	0.4164577D-02
337	0.9699273D-02	0.4163529D-02
338	0.1036922D-02	0.1518150D-01
339	0.1102695D-02	0.1518166D-01
340	0.1192097D-02	0.1518191D-01
341	0.1300835D-02	0.1518218D-01
342	0.1425798D-02	0.1518242D-01
343	0.1564718D-02	0.1518257D-01
344	0.7555111D-02	0.2084287D-02
345	0.7979430D-02	0.2083807D-02
346	0.8405968D-02	0.2083314D-02
347	0.8834375D-02	0.2082816D-02
348	0.9264374D-02	0.2082320D-02
349	0.9695754D-02	0.2081832D-02
350	0.1038383D-02	0.1476271D-01
351	0.1104161D-02	0.1476360D-01
352	0.1193574D-02	0.1476459D-01
353	0.1302317D-02	0.1476562D-01
354	0.1427281D-02	0.1476662D-01
355	0.1566201D-02	0.1476751D-01
356	0.7554054D-02	0.0
357	0.7978272D-02	0.0
358	0.8405097D-02	0.0
359	0.8833304D-02	0.0
360	0.9263587D-02	0.0

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NODAL POINT	UR	UZ
361	0.9694655D-02	0.0
362	0.1044051D-02	0.1434228D-01
363	0.1109850D-02	0.1434450D-01
364	0.1199301D-02	0.1434672D-01
365	0.1308069D-02	0.1434894D-01
366	0.1433038D-02	0.1435118D-01
367	0.1571956D-02	0.1435343D-01
368	0.1056383D-02	0.1392233D-01
369	0.1122223D-02	0.1392590D-01
370	0.1211749D-02	0.1392905D-01
371	0.1320571D-02	0.1393209D-01
372	0.1445556D-02	0.1393533D-01
373	0.1584475D-02	0.1393899D-01
374	0.1073379D-02	0.1350954D-01
375	0.1139304D-02	0.1351222D-01
376	0.1228971D-02	0.1351356D-01
377	0.1337880D-02	0.1351451D-01
378	0.1462878D-02	0.1351602D-01
379	0.1601786D-02	0.1351891D-01
380	0.1079487D-02	0.1311655D-01
381	0.1145301D-02	0.1311121D-01
382	0.1234833D-02	0.1310310D-01
383	0.1343798D-02	0.1309426D-01
384	0.1469012D-02	0.1308628D-01
385	0.1608058D-02	0.1308097D-01
386	0.1030873D-02	0.1276153D-01
387	0.1097029D-02	0.1273240D-01
388	0.1186786D-02	0.1270162D-01
389	0.1295147D-02	0.1267002D-01
390	0.1419234D-02	0.1263934D-01
391	0.1557688D-02	0.1261017D-01
392	0.8582712D-03	0.1244208D-01
393	0.9229122D-03	0.1238398D-01
394	0.1010759D-02	0.1231186D-01
395	0.1119463D-02	0.1223724D-01
396	0.1245713D-02	0.1216828D-01
397	0.1385452D-02	0.1211250D-01

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EL	R	Z	SIGMAR	SIGMAZ	SIGMAT	SIGMARZ	SIGMAMAX	SIGMAMIN	ANGLE	SIGMAM	SIGMAN	SIGMAMN	SIGMAINT
1	0.43	9.02	-1865.	107.	4832.	0.	107.	-1865.	90.00	-1865.	107.	0.	6697.
2	0.48	9.02	-1207.	26.	4068.	21.	26.	-1207.	89.03	-1207.	26.	21.	5274.
3	0.53	9.02	-732.	-18.	3516.	21.	-18.	-732.	88.30	-732.	-18.	21.	4248.
4	0.58	9.02	-379.	-39.	3115.	13.	-39.	-380.	87.79	-379.	-39.	13.	3494.
5	0.63	9.02	-112.	-42.	2826.	-4.	-42.	-112.	-86.83	-112.	-42.	-4.	2938.
6	0.43	8.82	-1862.	147.	4905.	12.	147.	-1862.	89.65	-1862.	147.	12.	6766.
7	0.48	8.82	-1203.	51.	4134.	16.	51.	-1203.	89.27	-1203.	51.	16.	5336.
8	0.53	8.82	-732.	-19.	3576.	16.	-18.	-732.	88.69	-732.	-19.	16.	4308.
9	0.58	8.82	-382.	-59.	3170.	16.	-58.	-383.	87.24	-382.	-59.	16.	3552.
10	0.63	8.82	-113.	-70.	2876.	10.	-68.	-115.	78.16	-113.	-70.	10.	2991.
11	0.43	8.62	-1861.	167.	4955.	1.	167.	-1861.	89.98	-1861.	167.	1.	6816.
12	0.48	8.62	-1200.	60.	4179.	1.	60.	-1200.	89.98	-1200.	60.	1.	5379.
13	0.53	8.62	-728.	-17.	3617.	-1.	-17.	-728.	-89.90	-728.	-17.	-1.	4345.
14	0.58	8.62	-379.	-64.	3208.	0.	-64.	-379.	89.97	-379.	-64.	0.	3587.
15	0.63	8.62	-113.	-87.	2911.	1.	-87.	-113.	88.18	-113.	-87.	1.	3023.
16	0.43	8.42	-1859.	123.	5008.	-21.	123.	-1859.	-89.39	-1859.	123.	-21.	6867.
17	0.48	8.42	-1197.	35.	4226.	-36.	36.	-1198.	-88.31	-1197.	35.	-36.	5424.
18	0.53	8.42	-727.	-20.	3660.	-42.	-18.	-729.	-86.60	-727.	-20.	-42.	4389.
19	0.58	8.42	-379.	-47.	3247.	-35.	-43.	-383.	-84.00	-379.	-47.	-35.	3630.
20	0.63	8.42	-113.	-51.	2948.	-20.	-45.	-119.	-73.31	-113.	-51.	-20.	3066.
21	0.43	8.22	-1858.	-28.	5031.	-52.	-26.	-1860.	-88.36	-1858.	-28.	-52.	6891.
22	0.48	8.22	-1196.	-48.	4247.	-87.	-41.	-1203.	-85.67	-1196.	-48.	-87.	5449.
23	0.53	8.22	-725.	-34.	3680.	-98.	-20.	-739.	-82.06	-725.	-34.	-98.	4418.
24	0.58	8.22	-378.	8.	3265.	-84.	26.	-395.	-78.23	-378.	8.	-84.	3660.
25	0.63	8.22	-112.	73.	2964.	-50.	85.	-125.	-75.78	-112.	73.	-50.	3088.
26	0.43	8.02	-1863.	-286.	4900.	-79.	-282.	-1867.	-87.13	-1863.	-286.	-79.	6766.
27	0.48	8.02	-1205.	-186.	4129.	-125.	-171.	-1220.	-83.13	-1205.	-186.	-125.	5348.
28	0.53	8.02	-731.	-58.	3572.	-137.	-31.	-758.	-78.92	-731.	-58.	-137.	4329.
29	0.58	8.02	-379.	99.	3166.	-119.	128.	-407.	-76.74	-379.	99.	-119.	3572.
30	0.63	8.02	-112.	287.	2873.	-77.	302.	-126.	-79.48	-112.	287.	-77.	2998.
31	0.43	7.82	-1879.	-503.	4375.	-46.	-501.	-1880.	-88.07	-1879.	-503.	-46.	6254.
32	0.48	7.82	-1233.	-289.	3656.	-47.	-287.	-1235.	-87.13	-1233.	-289.	-47.	4891.
33	0.53	7.82	-749.	-76.	3142.	-46.	-73.	-752.	-86.13	-749.	-76.	-46.	3893.
34	0.58	7.82	-384.	166.	2772.	-42.	169.	-388.	-85.65	-384.	166.	-42.	3159.
35	0.63	7.82	-109.	464.	2510.	-42.	467.	-112.	-85.86	-109.	464.	-42.	2622.
36	0.43	7.62	-1907.	-144.	3196.	194.	-123.	-1928.	83.78	-1907.	-144.	194.	5124.
37	0.48	7.62	-1273.	-81.	2595.	368.	23.	-1377.	74.17	-1273.	-81.	368.	3972.
38	0.53	7.62	-753.	-64.	2177.	396.	116.	-934.	65.50	-753.	-64.	396.	3110.
39	0.58	7.62	-352.	9.	1892.	305.	182.	-526.	60.32	-352.	9.	305.	2417.
40	0.63	7.62	-99.	200.	1701.	150.	262.	-162.	67.50	-99.	200.	150.	1862.

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EL	R	Z	SIGMAR	SIGMAZ	SIGMAT	SIGMARZ	SIGMAMAX	SIGMAMIN	ANGLE	SIGMAP	SIGMAN	SIGMAPN	SIGMAINT
41	0.43	7.42	-2005.	1858.	1556.	770.	2006.	-2153.	79.12	-2005.	1858.	770.	4158.
42	0.48	7.42	-1491.	1021.	1107.	1311.	1580.	-2051.	66.88	-1491.	1021.	1311.	3631.
43	0.53	7.42	-1006.	77.	805.	1480.	1111.	-2041.	55.05	-1006.	77.	1480.	3151.
44	0.58	7.42	-538.	-805.	615.	1255.	590.	-1933.	41.96	-538.	-805.	1255.	2548.
45	0.63	7.42	-95.	-1350.	514.	540.	105.	-1550.	20.36	-95.	-1350.	540.	2064.
46	0.43	7.22	-2019.	5867.	978.	1073.	6010.	-2163.	82.39	-2019.	5867.	1073.	8172.
47	0.48	7.22	-1726.	3540.	629.	1927.	4170.	-2357.	71.90	-1726.	3540.	1927.	6526.
48	0.53	7.22	-1510.	1000.	385.	2473.	2518.	-3028.	58.46	-1510.	1000.	2473.	5546.
49	0.58	7.22	-1306.	-1957.	220.	2744.	1132.	-4395.	41.62	-1306.	-1957.	2744.	5526.
50	0.63	7.22	-1036.	-5656.	121.	2703.	209.	-6901.	24.74	-1036.	-5656.	2703.	7110.
51	0.43	7.02	-1839.	9878.	3240.	125.	9879.	-1841.	89.39	-1839.	9878.	125.	11719.
52	0.48	7.02	-1381.	6619.	2145.	795.	6697.	-1459.	84.38	-1381.	6619.	795.	8155.
53	0.53	7.02	-1147.	3346.	1338.	1234.	3663.	-1463.	75.61	-1147.	3346.	1234.	5126.
54	0.58	7.02	-1042.	-101.	749.	1550.	1049.	-2191.	53.45	-1042.	-101.	1550.	3239.
55	0.63	7.02	-984.	-3891.	337.	1891.	-53.	-4823.	26.23	-984.	-3891.	1891.	5159.
56	0.70	6.99	-3620.	-6566.	-21.	8060.	3100.	-13286.	39.82	-3620.	-6566.	8060.	16386.
57	0.43	6.82	-1583.	13015.	8649.	59.	13015.	-1583.	89.77	-1583.	13015.	59.	14598.
58	0.48	6.82	-601.	9212.	5554.	694.	9261.	-650.	85.97	-601.	9212.	694.	9911.
59	0.53	6.82	-41.	5679.	3213.	1147.	5900.	-262.	79.08	-41.	5679.	1147.	6162.
60	0.58	6.82	261.	2456.	1445.	1530.	3242.	-524.	62.82	261.	2456.	1530.	3766.
61	0.63	6.82	387.	-366.	137.	1962.	2008.	-1987.	39.57	387.	-366.	1962.	3994.
62	0.70	6.79	204.	-3765.	-1247.	5909.	4454.	-8014.	35.72	204.	-3765.	5909.	12467.
63	0.72	6.91	386.	-3607.	-642.	-630.	483.	-3704.	-8.76	386.	-3607.	-630.	4186.
64	0.79	6.84	-619.	-7683.	-1520.	6873.	3577.	-11879.	31.40	-619.	-7683.	6873.	15455.
65	0.43	6.62	-1249.	16519.	16455.	251.	16523.	-1252.	89.19	-1249.	16519.	251.	17775.
66	0.48	6.62	275.	11887.	10838.	935.	11962.	200.	85.42	275.	11887.	935.	11761.
67	0.53	6.62	1046.	7819.	6495.	1374.	8087.	778.	78.96	1046.	7819.	1374.	7308.
68	0.58	6.62	1343.	4300.	3100.	1653.	5039.	603.	65.90	1343.	4300.	1653.	4436.
69	0.63	6.62	1338.	1327.	460.	1817.	3150.	-484.	44.91	1338.	1327.	1817.	3634.
70	0.70	6.59	3135.	-3198.	-2158.	4407.	5395.	-5459.	27.15	3135.	-3198.	4407.	10853.
71	0.72	6.70	-301.	-463.	-2246.	-676.	299.	-1063.	-41.57	-301.	-463.	-676.	2544.
72	0.78	6.64	2190.	-6072.	-3932.	4509.	4174.	-8056.	23.75	2190.	-6072.	4509.	12230.
73	0.83	6.62	-206.	-5836.	-3251.	2574.	794.	-6835.	21.22	-206.	-5836.	2574.	7629.
74	0.43	6.42	-760.	19936.	25891.	246.	19939.	-763.	89.32	-760.	19936.	246.	26653.
75	0.48	6.42	1459.	14436.	17903.	819.	14488.	1408.	86.40	1459.	14436.	819.	16495.
76	0.53	6.42	2546.	9750.	11680.	1200.	9944.	2352.	80.79	2546.	9750.	1200.	9328.
77	0.58	6.42	2950.	5804.	6753.	1460.	6419.	2336.	67.18	2950.	5804.	1460.	4416.
78	0.63	6.42	2930.	2514.	2790.	1638.	4373.	1070.	41.38	2930.	2514.	1638.	3302.
79	0.69	6.39	5336.	-2377.	-614.	3004.	6368.	-3409.	18.96	5336.	-2377.	3004.	9776.
80	0.71	6.50	120.	304.	-2620.	263.	491.	-66.	54.62	120.	304.	263.	3110.

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EL	R	Z	SIGMAR	SIGMAZ	SIGMAT	SIGMARZ	SIGMAMAX	SIGMAMIN	ANGLE	SIGMAM	SIGMAN	SIGMAMN	SIGMAINT
81	0.77	6.44	3912.	-5595.	-4591.	3372.	4987.	-6669.	17.67	3912.	-5595.	3372.	11656.
82	0.82	6.52	1094.	-4811.	-5558.	1710.	1554.	-5271.	15.04	1094.	-4811.	1710.	7111.
83	0.91	6.57	-167.	-4681.	-5974.	1853.	497.	-5344.	19.69	-167.	-4681.	1853.	6470.
84	0.43	6.22	-156.	22076.	36289.	24.	22076.	-156.	89.94	-156.	22076.	24.	36445.
85	0.48	6.22	2903.	16103.	26357.	237.	16107.	2899.	88.97	2903.	16103.	237.	23458.
86	0.53	6.22	4451.	11149.	18635.	412.	11174.	4425.	86.50	4451.	11149.	412.	14209.
87	0.58	6.22	5055.	7031.	12449.	587.	7192.	4894.	74.65	5055.	7031.	587.	7555.
88	0.63	6.22	5067.	3628.	7402.	775.	5405.	3290.	23.58	5067.	3628.	775.	4112.
89	0.69	6.19	7471.	-1145.	3493.	1112.	7612.	-1286.	7.23	7471.	-1145.	1112.	8898.
90	0.71	6.30	1799.	946.	-136.	721.	2210.	535.	29.70	1799.	946.	721.	2345.
91	0.77	6.23	5567.	-4709.	-2280.	2084.	5974.	-5116.	11.04	5567.	-4709.	2084.	11089.
92	0.82	6.31	2428.	-4131.	-5132.	1589.	2792.	-4496.	12.93	2428.	-4131.	1589.	7924.
93	0.91	6.37	1038.	-4961.	-7827.	1722.	1497.	-5420.	14.93	1038.	-4961.	1722.	9324.
94	1.00	6.42	73.	-3329.	-8309.	1115.	406.	-3662.	16.62	73.	-3329.	1115.	8714.
95	0.43	6.02	434.	21657.	46768.	-511.	21669.	421.	-88.62	434.	21657.	-511.	46346.
96	0.48	6.02	4350.	15867.	35276.	-901.	15937.	4280.	-85.56	4350.	15867.	-901.	30995.
97	0.53	6.02	6433.	11193.	26368.	-1107.	11438.	6188.	-77.53	6433.	11193.	-1107.	20180.
98	0.58	6.02	7360.	7378.	19206.	-1161.	8530.	6208.	-45.22	7360.	7378.	-1161.	12997.
99	0.63	6.02	7541.	4295.	13331.	-1098.	7878.	3959.	-17.03	7541.	4295.	-1098.	9372.
100	0.69	5.99	9888.	-22.	9076.	-1597.	10139.	-273.	-8.93	9888.	-22.	-1597.	10411.
101	0.70	6.10	4101.	1802.	4623.	45.	4102.	1801.	1.13	4101.	1802.	45.	2821.
102	0.76	6.03	7759.	-3586.	2154.	-34.	7759.	-3586.	-0.17	7759.	-3586.	-34.	11344.
103	0.81	6.11	4335.	-2948.	-2055.	683.	4398.	-3012.	5.31	4335.	-2948.	683.	7409.
104	0.90	6.16	2321.	-4525.	-6735.	1407.	2599.	-4803.	11.18	2321.	-4525.	1407.	9334.
105	1.00	6.22	910.	-4388.	-9261.	1502.	1306.	-4784.	14.77	910.	-4388.	1502.	10566.
106	1.09	6.27	106.	-2137.	-9758.	697.	305.	-2336.	15.94	106.	-2137.	697.	10063.
107	0.43	5.82	1065.	17888.	55885.*	-1186.	17971.	981.	-85.99	1065.	17888.	-1186.	54903.*
108	0.48	5.82	5956.	13173.	42305.	-2067.	13723.	5406.	-75.10	5956.	13173.	-2067.	37898.
109	0.53	5.82	8827.	9340.	33597.	-2609.	11706.	6462.	-47.81	8827.	9340.	-2609.	27135.
110	0.58	5.82	10375.	6210.	25824.	-2922.	11881.	4704.	-27.26	10375.	6210.	-2922.	21119.
111	0.63	5.82	11016.	3695.	19467.	-3061.	12127.	2584.	-19.95	11016.	3695.	-3061.	16882.
112	0.70	5.79	14830.	-1200.	13631.	-3701.	15643.	-2014.	-12.39	14830.	-1200.	-3701.	17656.
113	0.71	5.90	6662.	2500.	9783.	-2382.	7743.	1418.	-24.43	6662.	2500.	-2382.	8364.
114	0.77	5.83	11088.	-2638.	7102.	-2215.	11437.	-2987.	-8.94	11088.	-2638.	-2215.	14423.
115	0.81	5.91	7259.	-1537.	2742.	-1241.	7431.	-1708.	-7.88	7259.	-1537.	-1241.	9139.
116	0.90	5.96	4513.	-3201.	-3427.	18.	4513.	-3201.	0.14	4513.	-3201.	18.	7940.
117	0.99	6.01	2318.	-3914.	-7582.	985.	2470.	-4066.	8.77	2318.	-3914.	985.	10051.
118	1.08	6.07	681.	-3376.	-9894.	1303.	1064.	-3759.	16.36	681.	-3376.	1303.	10957.
119	1.17	6.12	-61.	-1329.	-10460.	576.	162.	-1552.	21.14	-61.	-1329.	576.	10621.
120	0.43	5.62	1755.	13218.	60258.*	-854.	13281.	1691.	-85.76	1755.	13218.	-854.	58566.*

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EL	R	Z	SIGMAR	SIGMAZ	SIGMAT	SIGMARZ	SIGMAMAX	SIGMAMIN	ANGLE	SIGMAM	SIGMAN	SIGMAMN	SIGMAINT
121	0.48	5.62	7709.	9541.	47075.	-1405.	10302.	6948.	-61.56	7709.	9541.	-1405.	40127.
122	0.53	5.62	11638.	6231.	36971.	-2017.	12307.	5562.	-18.36	11638.	6231.	-2017.	31408.
123	0.58	5.62	14158.	3473.	28948.	-2716.	14809.	2822.	-13.47	14158.	3473.	-2716.	26126.
124	0.63	5.62	15627.	1405.	22444.	-3446.	16418.	614.	-12.93	15627.	1405.	-3446.	21830.
125	0.70	5.60	21724.	-3330.	16275.	-5002.	22686.	-4292.	-10.88	21724.	-3330.	-5002.	26977.
126	0.72	5.71	9615.	2135.	13386.	-2930.	10626.	1124.	-19.04	9615.	2135.	-2930.	12261.
127	0.79	5.64	18158.	-3373.	9522.	-4070.	18901.	-4117.	-10.36	18158.	-3373.	-4070.	23018.
128	0.82	5.71	12090.	-368.	6838.	-3069.	12805.	-1083.	-13.11	12090.	-368.	-3069.	13887.
129	0.89	5.76	9113.	-1274.	1583.	-2093.	9519.	-1680.	-10.98	9113.	-1274.	-2093.	11198.
130	0.98	5.81	5919.	-2333.	-3741.	-519.	5951.	-2366.	-3.59	5919.	-2333.	-519.	9691.
131	1.08	5.86	3123.	-2757.	-7459.	578.	3179.	-2814.	5.56	3123.	-2757.	578.	10638.
132	1.17	5.92	961.	-2311.	-9668.	1040.	1264.	-2614.	16.22	961.	-2311.	1040.	10932.
133	1.26	5.97	-210.	-951.	-10378.	649.	167.	-1327.	30.14	-210.	-951.	649.	10544.
134	0.43	5.42	1366.	14478.	55249.*	1395.	14625.	1219.	83.99	1366.	14478.	1395.	54029.*
135	0.48	5.42	6888.	9005.	41244.	2099.	10297.	5596.	58.38	6888.	9005.	2099.	35648.
136	0.53	5.42	10478.	4010.	30359.	1922.	11007.	3482.	15.36	10478.	4010.	1922.	26877.
137	0.58	5.42	12782.	-130.	21615.	1054.	12867.	-216.	4.64	12782.	-130.	1054.	21830.
138	0.63	5.42	14165.	-3005.	14453.	-388.	14174.	-3014.	-1.29	14165.	-3005.	-388.	17466.
139	0.70	5.39	23409.	-10211.	5669.	-3755.	23823.	-10625.	-6.30	23409.	-10211.	-3755.	34448.
140	0.72	5.51	9775.	2039.	11365.	-2402.	10460.	1354.	-15.92	9775.	2039.	-2402.	10010.
141	0.79	5.45	25762.	-6988.	3326.	-4336.	26327.	-7552.	-7.42	25762.	-6988.	-4336.	33879.
142	0.81	5.56	10242.	3820.	6857.	-4101.	12239.	1823.	-25.97	10242.	3820.	-4101.	10416.
143	0.87	5.49	21587.	-3496.	1335.	-2891.	21916.	-3825.	-6.49	21587.	-3496.	-2891.	25740.
144	0.88	5.60	10572.	3149.	3593.	-4743.	12884.	838.	-25.98	10572.	3149.	-4743.	12045.
145	0.94	5.53	17726.	-1920.	-208.	-957.	17773.	-1967.	-2.78	17726.	-1920.	-957.	19739.
146	0.98	5.61	11359.	325.	-445.	-1653.	11601.	83.	-8.34	11359.	325.	-1653.	12046.
147	1.07	5.66	8694.	-1245.	-3693.	-633.	8734.	-1285.	-3.63	8694.	-1245.	-633.	12427.
148	1.16	5.71	5438.	-1835.	-6623.	86.	5440.	-1836.	0.68	5438.	-1835.	86.	12062.
149	1.26	5.77	2556.	-1607.	-8585.	425.	2599.	-1650.	5.77	2556.	-1607.	425.	11183.
150	1.35	5.82	353.	-747.	-9412.	449.	513.	-907.	19.60	353.	-747.	449.	9924.
151	0.43	5.22	-3.	22787.	43340.	2779.	23121.	-337.	83.15	-3.	22787.	2779.	43677.
152	0.48	5.22	3238.	12592.	29081.	3975.	14054.	1777.	69.82	3238.	12592.	3975.	27303.
153	0.53	5.22	4541.	3767.	17694.	4259.	8431.	-123.	42.40	4541.	3767.	4259.	17816.
154	0.58	5.22	4658.	-3950.	8317.	3755.	6065.	-5358.	20.55	4658.	-3950.	3755.	13675.
155	0.63	5.22	4007.	-10587.	384.	2340.	4373.	-10953.	8.89	4007.	-10587.	2340.	15325.
156	0.68	5.22	-620.	-17309.	-6647.	-5247.	893.	-18822.	-16.08	-620.	-17309.	-5247.	19714.
157	0.72	5.31	5585.	-10381.	-4636.	2868.	6085.	-10881.	9.88	5585.	-10381.	2868.	16965.
158	0.80	5.36	23077.	-2806.	-6910.	-4767.	23927.	-3656.	-10.11	23077.	-2806.	-4767.	30837.
159	0.91	5.39	21959.	-2097.	-8092.	-7910.	24326.	-4465.	-16.66	21959.	-2097.	-7910.	32418.
160	1.01	5.37	12378.	4955.	-9942.	-343.	12394.	4939.	-2.64	12378.	4955.	-343.	22335.

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EL	R	Z	SIGMAR	SIGMAZ	SIGMAT	SIGMARZ	SIGMAMAX	SIGMAMIN	ANGLE	SIGMAM	SIGMAN	SIGMAMN	SIGMAINT
161	0.98	5.46	16589.	619.	-4153.	-8186.	20040.	-2832.	-22.86	16589.	619.	-8186.	24192.
162	1.04	5.49	11376.	4228.	-4791.	-5679.	14512.	1092.	-28.91	11376.	4228.	-5679.	19302.
163	1.11	5.43	10995.	-2718.	-8617.	124.	10996.	-2719.	0.52	10995.	-2718.	124.	19613.
164	1.16	5.51	9706.	-1156.	-6403.	-1776.	9989.	-1439.	-9.05	9706.	-1156.	-1776.	16391.
165	1.25	5.56	7174.	-1859.	-7037.	-1172.	7323.	-2008.	-7.27	7174.	-1859.	-1172.	14360.
166	1.34	5.62	4562.	-1394.	-7826.	-952.	4710.	-1543.	-8.87	4562.	-1394.	-952.	12536.
167	1.43	5.67	1883.	-11.	-8189.	-738.	2137.	-265.	-18.97	1883.	-11.	-738.	10325.
168	0.43	5.02	-506.	27065.	33694.	-192.	27066.	-507.	-89.60	-506.	27065.	-192.	34201.
169	0.48	5.02	1678.	13939.	20279.	-230.	13944.	1674.	-88.92	1678.	13939.	-230.	18604.
170	0.53	5.02	2094.	2028.	9474.	-618.	2679.	1442.	-43.47	2094.	2028.	-618.	8031.
171	0.58	5.02	1534.	-9553.	516.	-1416.	1712.	-9730.	-7.16	1534.	-9553.	-1416.	11442.
172	0.63	5.02	558.	-21939.	-7106.	-2676.	872.	-22253.	-6.69	558.	-21939.	-2676.	23124.
173	1.07	5.31	15537.	-2295.	-12174.	-7348.	18175.	-4933.	-19.75	15537.	-2295.	-7348.	30348.
174	1.13	5.34	11846.	914.	-10556.	-7370.	15556.	-2796.	-26.72	11846.	914.	-7370.	26111.
175	1.20	5.28	5557.	-2081.	-10322.	-2413.	6256.	-2780.	-16.14	5557.	-2081.	-2413.	16578.
176	1.24	5.36	6903.	-2226.	-9467.	-3379.	8018.	-3341.	-18.26	6903.	-2226.	-3379.	17484.
177	1.34	5.42	5888.	-2318.	-8742.	-2713.	6703.	-3134.	-16.74	5888.	-2318.	-2713.	15445.
178	1.43	5.48	4576.	-989.	-8439.	-2502.	5536.	-1948.	-20.98	4576.	-989.	-2502.	13974.
179	1.52	5.53	2990.	1579.	-8209.	-2475.	4859.	-289.	-37.05	2990.	1579.	-2475.	13067.
180	0.43	4.82	-372.	24677.	29925.	-950.	24713.	-408.	-87.83	-372.	24677.	-950.	30332.
181	0.48	4.82	2148.	12404.	17050.	-1454.	12606.	1946.	-82.08	2148.	12404.	-1454.	15103.
182	0.53	4.82	3134.	1111.	6723.	-1587.	4005.	240.	-28.75	3134.	1111.	-1587.	6483.
183	0.58	4.82	3250.	-9281.	-1789.	-1330.	3389.	-9421.	-5.99	3250.	-9281.	-1330.	12810.
184	0.63	4.82	2918.	-18666.	-8984.	-486.	2929.	-18677.	-1.29	2918.	-18666.	-486.	21606.
185	1.24	5.16	2534.	-1926.	-8160.	-3053.	4084.	-3476.	-26.93	2534.	-1926.	-3053.	12244.
186	1.33	5.21	2979.	-2891.	-8325.	-2934.	4194.	-4106.	-22.49	2979.	-2891.	-2934.	12518.
187	1.42	5.27	3428.	-1998.	-8263.	-3147.	4870.	-3440.	-24.62	3428.	-1998.	-3147.	13133.
188	1.52	5.33	3335.	266.	-8073.	-3386.	5518.	-1917.	-32.81	3335.	266.	-3386.	13590.
189	1.61	5.38	2617.	4087.	-7805.	-3713.	7137.	-433.	-50.60	2617.	4087.	-3713.	14941.
190	0.43	4.62	-371.	21955.	29565.	-463.	21965.	-381.	-88.81	-371.	21955.	-463.	29945.
191	0.48	4.62	2201.	11010.	16727.	-789.	11080.	2131.	-84.92	2201.	11010.	-789.	14595.
192	0.53	4.62	3249.	968.	6436.	-854.	3533.	683.	-18.41	3249.	968.	-854.	5753.
193	0.58	4.62	3299.	-8212.	-2048.	-704.	3342.	-8255.	-3.49	3299.	-8212.	-704.	11596.
194	0.63	4.62	2632.	-16643.	-9235.	-435.	2642.	-16653.	-1.29	2632.	-16643.	-435.	19294.
195	1.32	5.01	-1073.	-3888.	-3723.	-312.	-1039.	-3923.	-6.25	-1073.	-3888.	-312.	2883.
196	1.42	5.06	809.	-2489.	-4682.	-1658.	1499.	-3178.	-22.58	809.	-2489.	-1658.	6180.
197	1.51	5.11	1633.	-699.	-5312.	-2243.	2996.	-2061.	-31.27	1633.	-699.	-2243.	8307.
198	1.60	5.17	2204.	1967.	-5728.	-2966.	5054.	-883.	-43.86	2204.	1967.	-2966.	10782.
199	1.69	5.22	2819.	6180.	-5961.	-4537.	9338.	-339.	-55.16	2819.	6180.	-4537.	15298.
200	0.43	4.42	-364.	20676.	30205.	-152.	20677.	-365.	-89.59	-364.	20676.	-152.	30570.

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EL	R	Z	SIGMAR	SIGMAZ	SIGMAT	SIGMARZ	SIGMAMAX	SIGMAMIN	ANGLE	SIGMAM	SIGMAN	SIGMAMN	SIGMAINT
201	0.48	4.42	2198.	10318.	17296.	-281.	10327.	2188.	-88.02	2198.	10318.	-281.	15107.
202	0.53	4.42	3216.	875.	6945.	-322.	3260.	832.	-7.68	3216.	875.	-322.	6113.
203	0.58	4.42	3256.	-7739.	-1589.	-276.	3263.	-7746.	-1.43	3256.	-7739.	-276.	11008.
204	0.63	4.42	2663.	-15617.	-8815.	-142.	2664.	-15618.	-0.45	2663.	-15617.	-142.	18281.
205	1.45	4.78	-2045.	-3293.	712.	460.	-1894.	-3445.	18.21	-2045.	-3293.	460.	4157.
206	1.55	4.83	-929.	-1110.	-214.	-487.	-525.	-1515.	-39.74	-929.	-1110.	-487.	1301.
207	1.64	4.89	90.	1080.	-1012.	-1330.	2004.	-834.	-55.21	90.	1080.	-1330.	3016.
208	1.73	4.94	971.	3440.	-1689.	-2256.	4777.	-366.	-59.35	971.	3440.	-2256.	6465.
209	1.82	4.99	1915.	5807.	-2255.	-3484.	7852.	-130.	-59.59	1915.	5807.	-3484.	10107.
210	0.43	4.22	-344.	20303.	30810.	-12.	20303.	-344.	-89.97	-344.	20303.	-12.	31153.
211	0.48	4.22	2235.	10100.	17835.	-34.	10100.	2234.	-89.75	2235.	10100.	-34.	15600.
212	0.53	4.22	3246.	841.	7433.	-42.	3246.	840.	-0.99	3246.	841.	-42.	6593.
213	0.58	4.22	3273.	-7588.	-1145.	-30.	3273.	-7588.	-0.16	3273.	-7588.	-30.	10860.
214	0.63	4.22	2660.	-15311.	-8409.	-8.	2660.	-15311.	-0.03	2660.	-15311.	-8.	17971.
215	1.63	4.48	-2579.	-1543.	3956.	447.	-1377.	-2745.	69.61	-2579.	-1543.	447.	6701.
216	1.7[illegible]	4.53	-1819.	466.	3217.	-121.	473.	-1826.	-86.98	-1819.	466.	-121.	5042.
217	1.81	4.59	-1011.	2274.	2565.	-746.	2436.	-1172.	-77.79	-1011.	2274.	-746.	3737.
218	1.90	4.64	-110.	3865.	1990.	-1504.	4370.	-615.	-71.44	-110.	3865.	-1504.	4985.
219	2.00	4.69	936.	5293.	1489.	-2474.	6411.	-182.	-65.68	936.	5293.	-2474.	6593.
220	0.43	4.02	-333.	20321.	31140.	30.	20321.	-333.	89.92	-333.	20321.	30.	31473.
221	0.48	4.02	2254.	10103.	18129.	46.	10103.	2253.	89.67	2254.	10103.	46.	15875.
222	0.53	4.02	3259.	844.	7699.	49.	3260.	843.	1.16	3259.	844.	49.	6855.
223	0.58	4.02	3275.	-7586.	-903.	43.	3275.	-7586.	0.23	3275.	-7586.	43.	10861.
224	0.63	4.02	2660.	-15329.	-8188.	29.	2660.	-15329.	0.09	2660.	-15329.	29.	17988.
225	1.74	4.28	-2534.	-113.	5068.	106.	-108.	-2538.	87.51	-2534.	-113.	106.	7606.
226	1.84	4.32	-1957.	1691.	4494.	-260.	1710.	-1976.	-85.95	-1957.	1691.	-260.	6469.
227	1.94	4.36	-1311.	2947.	3995.	-646.	3043.	-1407.	-81.56	-1311.	2947.	-646.	5401.
228	2.04	4.40	-586.	3857.	3569.	-1083.	4107.	-836.	-77.00	-586.	3857.	-1083.	4942.
229	2.14	4.45	239.	4302.	3210.	-1507.	4799.	-259.	-71.72	239.	4302.	-1507.	5058.
230	0.43	3.82	-330.	20432.	31254.	28.	20432.	-330.	89.92	-330.	20432.	28.	31584.
231	0.48	3.82	2260.	10159.	18231.	45.	10159.	2260.	89.67	2260.	10159.	45.	15971.
232	0.53	3.82	3262.	853.	7790.	49.	3263.	852.	1.16	3262.	853.	49.	6938.
233	0.58	3.82	3276.	-7624.	-820.	43.	3276.	-7624.	0.22	3276.	-7624.	43.	10900.
234	0.63	3.82	2659.	-15420.	-8112.	25.	2659.	-15420.	0.08	2659.	-15420.	25.	18078.
235	1.77	4.12	-2150.	712.	5742.	-158.	721.	-2159.	-86.84	-2150.	712.	-158.	7901.
236	1.88	4.13	-1746.	1841.	5283.	-83.	1842.	-1748.	-88.67	-1746.	1841.	-83.	7030.
237	1.98	4.15	-1257.	2822.	4893.	-222.	2834.	-1269.	-86.90	-1257.	2822.	-222.	6162.
238	2.09	4.16	-735.	3575.	4567.	-404.	3612.	-772.	-84.68	-735.	3575.	-404.	5339.
239	2.20	4.17	-196.	4110.	4297.	-534.	4175.	-261.	-83.03	-196.	4110.	-534.	4558.
240	0.43	3.62	-329.	20517.	31264.	14.	20517.	-329.	89.96	-329.	20517.	14.	31593.

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EL	R	Z	SIGMAR	SIGMAZ	SIGMAT	SIGMARZ	SIGMAMAX	SIGMAMIN	ANGLE	SIGMAM	SIGMAN	SIGMAMN	SIGMAINT
241	0.48	3.62	2261.	10205.	13240.	25.	10205.	2261.	89.82	2261.	10205.	25.	15978.
242	0.53	3.62	3263.	860.	7798.	27.	3263.	860.	0.64	3263.	860.	27.	6938.
243	0.58	3.62	3275.	-7655.	-813.	23.	3275.	-7655.	0.12	3275.	-7655.	23.	10930.
244	0.63	3.62	2659.	-15489.	-8106.	12.	2659.	-15489.	0.04	2659.	-15489.	12.	18147.
245	1.77	3.75	-1932.	1197.	7006.	-16.	1197.	-1932.	-89.70	-1932.	1197.	-16.	8938.
246	1.88	3.75	-1398.	1876.	6547.	76.	1878.	-1400.	88.66	-1398.	1876.	76.	7946.
247	1.98	3.75	-947.	2586.	6161.	106.	2589.	-950.	88.28	-947.	2586.	106.	7111.
248	2.09	3.75	-543.	3305.	5836.	92.	3308.	-545.	88.63	-543.	3305.	92.	6380.
249	2.20	3.75	-180.	4045.	5559.	64.	4046.	-180.	89.13	-180.	4045.	64.	5739.
250	0.43	3.42	-330.	20555.	31243.	4.	20555.	-330.	89.99	-330.	20555.	4.	31572.
251	0.48	3.42	2260.	10226.	18221.	8.	10226.	2260.	89.94	2260.	10226.	8.	15961.
252	0.53	3.42	3262.	863.	7781.	8.	3262.	863.	0.20	3262.	863.	8.	6917.
253	0.58	3.42	3275.	-7669.	-828.	7.	3275.	-7669.	0.04	3275.	-7669.	7.	10944.
254	0.63	3.42	2659.	-15520.	-8120.	3.	2659.	-15520.	0.01	2659.	-15520.	3.	18178.
255	1.77	3.25	-1934.	1543.	8056.	150.	1549.	-1941.	87.54	-1934.	1543.	150.	9996.
256	1.88	3.25	-1372.	2090.	7538.	211.	2102.	-1385.	86.52	-1372.	2090.	211.	8922.
257	1.98	3.25	-896.	2623.	7103.	234.	2639.	-911.	86.21	-896.	2623.	234.	8013.
258	2.09	3.25	-492.	3157.	6733.	214.	3169.	-504.	86.65	-492.	3157.	214.	7237.
259	2.20	3.25	-149.	3696.	6415.	146.	3701.	-155.	87.83	-149.	3696.	146.	6570.
260	0.43	3.22	-331.	20562.	31222.	-1.	20562.	-331.	-90.00	-331.	20562.	-1.	31552.
261	0.48	3.22	2258.	10230.	18202.	-1.	10230.	2258.	-89.99	2258.	10230.	-1.	15943.
262	0.53	3.22	3261.	864.	7764.	-2.	3261.	864.	-0.05	3261.	864.	-2.	6899.
263	0.58	3.22	3275.	-7673.	-844.	-1.	3275.	-7673.	-0.01	3275.	-7673.	-1.	10947.
264	0.63	3.22	2659.	-15526.	-8134.	-2.	2659.	-15526.	-0.01	2659.	-15526.	-2.	18184.
265	1.77	2.75	-1933.	2044.	8427.	119.	2048.	-1937.	88.29	-1933.	2044.	119.	10363.
266	1.88	2.75	-1374.	2346.	7888.	188.	2356.	-1384.	87.12	-1374.	2346.	188.	9272.
267	1.98	2.75	-904.	2652.	7434.	207.	2664.	-916.	86.68	-904.	2652.	207.	8350.
268	2.09	2.75	-503.	2954.	7047.	181.	2963.	-513.	87.01	-503.	2954.	181.	7559.
269	2.20	2.75	-157.	3244.	6713.	113.	3248.	-161.	88.09	-157.	3244.	113.	6874.
270	0.43	3.02	-331.	20556.	31204.	-2.	20556.	-331.	-89.99	-331.	20556.	-2.	31535.
271	0.48	3.02	2257.	10227.	18186.	-4.	10227.	2257.	-89.97	2257.	10227.	-4.	15928.
272	0.53	3.02	3260.	863.	7750.	-4.	3260.	863.	-0.11	3260.	863.	-4.	6886.
273	0.58	3.02	3275.	-7671.	-856.	-3.	3275.	-7671.	-0.02	3275.	-7671.	-3.	10945.
274	0.63	3.02	2659.	-15521.	-8146.	-3.	2659.	-15521.	-0.01	2659.	-15521.	-3.	18179.
275	1.77	2.25	-1932.	2411.	8445.	67.	2412.	-1933.	89.11	-1932.	2411.	67.	10378.
276	1.88	2.25	-1372.	2538.	7906.	109.	2541.	-1375.	88.41	-1372.	2538.	109.	9280.
277	1.98	2.25	-903.	2671.	7451.	121.	2675.	-907.	88.06	-903.	2671.	121.	8357.
278	2.09	2.25	-504.	2800.	7063.	106.	2803.	-507.	88.16	-504.	2800.	106.	7569.
279	2.20	2.25	-157.	2918.	6728.	65.	2919.	-159.	88.79	-157.	2918.	65.	6887.
280	0.43	2.82	-332.	20554.	31182.	1.	20554.	-332.	90.00	-332.	20554.	1.	31513.

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EL	R	Z	SIGMAR	SIGMAZ	SIGMAT	SIGMARZ	SIGMAMAX	SIGMAMIN	ANGLE	SIGMAM	SIGMAN	SIGMAMN	SIGMAINT
281	0.48	2.82	2256.	10227.	18166.	2.	10227.	2256.	89.98	2256.	10227.	2.	15910.
282	0.53	2.82	3259.	863.	7732.	2.	3259.	863.	0.04	3259.	863.	2.	6868.
283	0.58	2.82	3274.	-7670.	-873.	2.	3274.	-7670.	0.01	3274.	-7670.	2.	10944.
284	0.63	2.82	2659.	-15519.	-8161.	-0.	2659.	-15519.	-0.00	2659.	-15519.	-0.	18177.
285	1.77	1.75	-1934.	2600.	8344.	27.	2600.	-1934.	89.66	-1934.	2600.	27.	10277.
286	1.88	1.75	-1374.	2640.	7810.	45.	2640.	-1375.	89.36	-1374.	2640.	45.	9184.
287	1.98	1.75	-904.	2681.	7360.	51.	2682.	-905.	89.19	-904.	2681.	51.	8265.
288	2.09	1.75	-504.	2719.	6977.	44.	2719.	-504.	89.22	-504.	2719.	44.	7481.
289	2.20	1.75	-157.	2748.	6647.	26.	2748.	-158.	89.49	-157.	2748.	26.	6804.
290	0.43	2.62	-333.	20576.	31151.	9.	20576.	-333.	89.97	-333.	20576.	9.	31483.
291	0.48	2.62	2254.	10239.	18139.	17.	10239.	2254.	89.88	2254.	10239.	17.	15884.
292	0.53	2.62	3258.	865.	7707.	18.	3258.	865.	0.43	3258.	865.	18.	6842.
293	0.58	2.62	3274.	-7679.	-856.	16.	3274.	-7679.	0.08	3274.	-7679.	16.	10953.
294	0.63	2.62	2659.	-15536.	-8182.	7.	2659.	-15536.	0.02	2659.	-15536.	7.	18194.
295	1.77	1.25	-1935.	2667.	8239.	5.	2667.	-1935.	89.94	-1935.	2667.	5.	10173.
296	1.88	1.25	-1377.	2676.	7711.	10.	2676.	-1377.	89.86	-1377.	2676.	10.	9087.
297	1.98	1.25	-906.	2684.	7266.	11.	2684.	-906.	89.82	-906.	2684.	11.	8172.
298	2.09	1.25	-504.	2689.	6887.	9.	2689.	-504.	89.83	-504.	2689.	9.	7391.
299	2.20	1.25	-157.	2689.	6562.	4.	2689.	-157.	89.91	-157.	2689.	4.	6719.
300	0.43	2.42	-334.	20647.	31125.	25.	20647.	-334.	89.93	-334.	20647.	25.	31458.
301	0.48	2.42	2253.	10278.	18116.	43.	10278.	2253.	89.69	2253.	10278.	43.	15863.
302	0.53	2.42	3257.	870.	7686.	47.	3258.	870.	1.12	3257.	870.	47.	6816.
303	0.58	2.42	3273.	-7706.	-914.	40.	3274.	-7706.	0.21	3273.	-7706.	40.	10979.
304	0.63	2.42	2658.	-15594.	-8199.	22.	2658.	-15594.	0.07	2658.	-15594.	22.	18252.
305	1.77	0.75	-1936.	2675.	8169.	-2.	2675.	-1936.	-89.97	-1936.	2675.	-2.	10105.
306	1.88	0.75	-1379.	2681.	7645.	-3.	2681.	-1379.	-89.96	-1379.	2681.	-3.	9023.
307	1.98	0.75	-908.	2685.	7203.	-3.	2685.	-908.	-89.96	-908.	2685.	-3.	8110.
308	2.09	0.75	-505.	2685.	6828.	-3.	2685.	-505.	-89.95	-505.	2685.	-3.	7332.
309	2.20	0.75	-158.	2682.	6505.	-2.	2682.	-158.	-89.95	-158.	2682.	-2.	6663.
310	0.43	2.22	-332.	20782.	31163.	43.	20783.	-332.	89.88	-332.	20782.	43.	31495.
311	0.48	2.22	2255.	10350.	18150.	69.	10350.	2255.	89.51	2255.	10350.	69.	15895.
312	0.53	2.22	3258.	882.	7717.	75.	3261.	880.	1.80	3258.	882.	75.	6837.
313	0.58	2.22	3273.	-7754.	-886.	65.	3274.	-7755.	0.34	3273.	-7754.	65.	11028.
314	0.63	.22	2658.	-15704.	-8173.	39.	2658.	-15704.	0.12	2658.	-15704.	39.	18361.
315	1.77	0.25	-1936.	2668.	8139.	-2.	2668.	-1936.	-89.98	-1936.	2668.	-2.	10074.
316	1.88	0.25	-1379.	2678.	7617.	-2.	2678.	-1379.	-89.97	-1379.	2678.	-2.	8995.
317	1.98	0.25	-907.	2685.	7177.	-2.	2685.	-907.	-89.96	-907.	2685.	-2.	8084.
318	2.09	0.25	-504.	2688.	6803.	-2.	2688.	-504.	-89.96	-504.	2688.	-2.	7306.
319	2.20	0.25	-157.	2688.	6482.	-1.	2688.	-157.	-89.97	-157.	2688.	-1.	6638.
320	0.43	2.02	-325.	20929.	31387.	37.	20929.	-325.	89.90	-325.	20929.	37.	31712.

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EL	R	Z	SIGMAR	SIGMAZ	SIGMAT	SIGMARZ	SIGMAMAX	SIGMAMIN	ANGLE	SIGMAM	SIGMAN	SIGMAMN	SIGMAINT
321	0.48	2.02	2268.	10423.	18350.	49.	10423.	2268.	89.66	2268.	10423.	49.	16082.
322	0.53	2.02	3266.	895.	7898.	51.	3268.	894.	1.23	3266.	895.	51.	7004.
323	0.58	2.02	3275.	-7802.	-722.	48.	3275.	-7803.	0.25	3275.	-7802.	48.	11077.
324	0.63	2.02	2657.	-15824.	-8023.	34.	2657.	-15824.	0.11	2657.	-15824.	34.	18481.
325	0.43	1.82	-308.	20863.	31954.	-53.	20863.	-308.	-89.86	-308.	20863.	-53.	32262.
326	0.48	1.82	2299.	10375.	18854.	-113.	10377.	2297.	-89.20	2299.	10375.	-113.	16557.
327	0.53	1.82	3287.	891.	8353.	-129.	3294.	884.	-3.08	3287.	891.	-129.	7468.
328	0.58	1.82	3280.	-7765.	-308.	-103.	3281.	-7766.	-0.53	3280.	-7765.	-103.	11047.
329	0.63	1.82	2657.	-15774.	-7644.	-45.	2657.	-15774.	-0.14	2657.	-15774.	-45.	18431.
330	0.43	1.62	-274.	20076.	32876.	-308.	20081.	-279.	-89.13	-274.	20076.	-308.	33155.
331	0.48	1.62	2357.	9932.	19678.	-550.	9972.	2317.	-85.87	2357.	9932.	-550.	17360.
332	0.53	1.62	3325.	829.	9097.	-618.	3470.	684.	-13.18	3325.	829.	-618.	8412.
333	0.58	1.62	3288.	-7454.	368.	-517.	3313.	-7479.	-2.75	3288.	-7454.	-517.	10791.
334	0.63	1.62	2654.	-15144.	-7026.	-275.	2659.	-15148.	-0.89	2654.	-15144.	-275.	17807.
335	0.43	1.42	-281.	17840.	33602.	-772.	17873.	-314.	-87.57	-281.	17840.	-772.	33915.
336	0.48	1.42	2359.	8711.	20321.	-1309.	8970.	2100.	-78.80	2359.	8711.	-1309.	18221.
337	0.53	1.42	3364.	639.	9677.	-1443.	3986.	17.	-23.32	3364.	639.	-1443.	9659.
338	0.58	1.42	3349.	-6622.	898.	-1252.	3504.	-6777.	-7.05	3349.	-6622.	-1252.	10281.
339	0.63	1.42	2688.	-13322.	-6538.	-723.	2721.	-13355.	-2.58	2688.	-13322.	-723.	16075.
340	0.43	1.22	-218.	13763.	32271.	-1392.	13900.	-355.	-84.37	-218.	13763.	-1392.	32626.
341	0.48	1.22	2383.	6625.	19145.	-1990.	7413.	1596.	-68.41	2383.	6625.	-1990.	17549.
342	0.53	1.22	3218.	316.	8615.	-2165.	4373.	-839.	-28.09	3218.	316.	-2165.	9454.
343	0.58	1.22	3109.	-5213.	-81.	-1857.	3504.	-5609.	-12.03	3109.	-5213.	-1857.	9112.
344	0.63	1.22	2569.	-10032.	-7447.	-1237.	2689.	-10152.	-5.55	2569.	-10032.	-1237.	12841.
345	0.43	1.02	-538.	9289.	25307.	-74.	9290.	-538.	-89.57	-538.	9289.	-74.	25844.
346	0.48	1.02	1929.	3799.	12927.	-2063.	5129.	599.	-57.19	1929.	3799.	-2063.	12328.
347	0.53	1.02	3147.	108.	3007.	-2434.	4497.	-1242.	-29.01	3147.	108.	-2434.	5738.
348	0.58	1.02	3382.	-3053.	-5156.	-1631.	3771.	-3442.	-13.44	3382.	-3053.	-1631.	8927.
349	0.63	1.02	2751.	-6685.	-12068.	198.	2755.	-6689.	1.20	2751.	-6685.	198.	14823.

EL	EPSR	EPSZ	EPST	EPSRZ	EPSMAX	EPSMIN	ANGLE	EPSM	EPSN	EPSMN	TEMPERATURE
1	-0.007	0.000	0.017	0.000	0.000	-0.007	0.0	-0.007	0.000	0.000	201.
2	-0.004	0.000	0.015	0.000	0.000	-0.004	89.03	-0.004	0.000	0.000	202.
3	-0.003	-0.000	0.013	0.000	-0.000	-0.003	88.30	-0.003	-0.000	0.000	202.
4	-0.001	-0.000	0.011	0.000	-0.000	-0.001	87.79	-0.001	-0.000	0.000	203.
5	-0.000	-0.000	0.010	-0.000	-0.000	-0.000	-86.83	-0.000	-0.000	-0.000	203.
6	-0.007	0.001	0.018	0.000	0.001	-0.007	89.65	-0.007	0.001	0.000	201.
7	-0.004	0.000	0.015	0.000	0.000	-0.004	89.27	-0.004	0.000	0.000	202.
8	-0.003	-0.000	0.013	0.000	-0.000	-0.003	88.69	-0.003	-0.000	0.000	202.
9	-0.001	-0.000	0.011	0.000	-0.000	-0.001	87.24	-0.001	-0.000	0.000	203.
10	-0.000	-0.000	0.010	0.000	-0.000	-0.000	78.16	-0.000	-0.000	0.000	203.
11	-0.007	0.001	0.018	0.000	0.001	-0.007	0.0	-0.007	0.001	0.000	201.
12	-0.004	0.000	0.015	0.000	0.000	-0.004	0.0	-0.004	0.000	0.000	202.
13	-0.003	-0.000	0.013	-0.000	-0.000	-0.003	0.0	-0.003	-0.000	-0.000	202.
14	-0.001	-0.000	0.012	0.000	-0.000	-0.001	0.0	-0.001	-0.000	0.000	203.
15	-0.000	-0.000	0.011	0.000	-0.000	-0.000	0.0	-0.000	-0.000	0.000	203.
16	-0.007	0.000	0.018	-0.000	0.000	-0.007	-89.39	-0.007	0.000	-0.000	201.
17	-0.004	0.000	0.015	-0.000	0.000	-0.004	-88.31	-0.004	0.000	-0.000	202.
18	-0.003	-0.000	0.013	-0.000	-0.000	-0.003	-86.60	-0.003	-0.000	-0.000	202.
19	-0.001	-0.000	0.012	-0.000	-0.000	-0.001	-84.00	-0.001	-0.000	-0.000	203.
20	-0.000	-0.000	0.011	-0.000	-0.000	-0.000	-73.31	-0.000	-0.000	-0.000	203.
21	-0.007	-0.000	0.018	-0.000	-0.000	-0.007	-88.36	-0.007	-0.000	-0.000	201.
22	-0.004	-0.000	0.015	-0.001	-0.000	-0.004	-85.67	-0.004	-0.000	-0.001	202.
23	-0.003	-0.000	0.013	-0.001	-0.000	-0.003	-82.06	-0.003	-0.000	-0.001	202.
24	-0.001	0.000	0.012	-0.001	0.000	-0.001	-78.23	-0.001	0.000	-0.001	203.
25	-0.000	0.000	0.011	-0.000	0.000	-0.000	-75.78	-0.000	0.000	-0.000	203.
26	-0.007	-0.001	0.018	-0.001	-0.001	-0.007	-87.13	-0.007	-0.001	-0.001	201.
27	-0.004	-0.001	0.015	-0.001	-0.001	-0.004	-83.13	-0.004	-0.001	-0.001	202.
28	-0.003	-0.000	0.013	-0.001	-0.000	-0.003	-78.92	-0.003	-0.000	-0.001	202.
29	-0.001	0.000	0.011	-0.001	0.000	-0.001	-76.74	-0.001	0.000	-0.001	203.
30	-0.000	0.001	0.010	-0.001	0.001	-0.000	-79.48	-0.000	0.001	-0.001	203.
31	-0.007	-0.002	0.016	-0.000	-0.002	-0.007	-88.07	-0.007	-0.002	-0.000	201.
32	-0.004	-0.001	0.013	-0.000	-0.001	-0.004	-87.13	-0.004	-0.001	-0.000	202.
33	-0.003	-0.000	0.011	-0.000	-0.000	-0.003	-86.13	-0.003	-0.000	-0.000	202.
34	-0.001	0.001	0.010	-0.000	0.001	-0.001	-85.65	-0.001	0.001	-0.000	203.
35	-0.000	0.002	0.009	-0.000	0.002	-0.000	-85.86	-0.000	0.002	-0.000	203.
36	-0.007	-0.001	0.012	0.001	-0.000	-0.007	83.78	-0.007	-0.001	0.001	201.
37	-0.005	-0.000	0.009	0.003	0.000	-0.005	74.17	-0.005	-0.000	0.003	202.
38	-0.003	-0.000	0.008	0.003	0.000	-0.003	65.50	-0.003	-0.000	0.003	202.
39	-0.001	0.000	0.007	0.002	0.001	-0.002	60.32	-0.001	0.000	0.002	203.
40	-0.000	0.001	0.006	0.001	0.001	-0.001	67.50	-0.000	0.001	0.001	203.

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EL	EPSR	EPSZ	EPST	EPSRZ	EPSMAX	EPSMIN	ANGLE	EPSM	EPSN	EPSMN	TEMPERATURE
41	-0.007	0.007	0.006	0.006	0.007	-0.008	79.12	-0.007	0.007	0.006	201.
42	-0.005	0.004	0.004	0.009	0.006	-0.007	66.88	-0.005	0.004	0.009	202.
43	-0.004	0.000	0.003	0.011	0.004	-0.007	55.05	-0.004	0.000	0.011	202.
44	-0.002	-0.003	0.002	0.009	0.002	-0.007	41.96	-0.002	-0.003	0.009	203.
45	-0.000	-0.005	0.002	0.004	0.000	-0.006	20.36	-0.000	-0.005	0.004	203.
46	-0.007	0.021	0.004	0.008	0.022	-0.008	82.39	-0.007	0.021	0.008	201.
47	-0.006	0.013	0.002	0.014	0.015	-0.009	71.90	-0.006	0.013	0.014	201.
48	-0.005	0.004	0.001	0.018	0.009	-0.011	58.46	-0.005	0.004	0.018	202.
49	-0.005	-0.007	0.001	0.020	0.004	-0.016	41.62	-0.005	-0.007	0.020	202.
50	-0.004	-0.020	0.000	0.020	0.001	-0.025	24.74	-0.004	-0.020	0.020	202.
51	-0.007	0.036	0.012	0.001	0.036	-0.007	89.39	-0.007	0.036	0.001	207.
52	-0.005	0.024	0.008	0.006	0.024	-0.005	84.38	-0.005	0.024	0.006	211.
53	-0.004	0.012	0.005	0.009	0.013	-0.005	75.61	-0.004	0.012	0.009	213.
54	-0.004	-0.000	0.003	0.011	0.004	-0.008	53.45	-0.004	-0.000	0.011	216.
55	-0.004	-0.014	0.001	0.014	-0.000	-0.017	26.23	-0.004	-0.014	0.014	217.
56	-0.013	-0.024	-0.000	0.058	0.011	-0.048	39.82	-0.013	-0.024	0.058	222.
57	-0.006	0.047	0.031	0.000	0.047	-0.006	89.77	-0.006	0.047	0.000	221.
58	-0.002	0.033	0.020	0.005	0.034	-0.002	85.97	-0.002	0.033	0.005	233.
59	-0.000	0.021	0.012	0.008	0.022	-0.001	79.08	-0.000	0.021	0.008	244.
60	0.001	0.009	0.005	0.011	0.012	-0.002	62.82	0.001	0.009	0.011	253.
61	0.001	-0.001	0.001	0.014	0.007	-0.007	39.57	0.001	-0.001	0.014	260.
62	0.001	-0.014	-0.005	0.043	0.016	-0.029	35.72	0.001	-0.014	0.043	275.
63	0.001	-0.013	-0.002	-0.005	0.002	-0.013	-8.76	0.001	-0.013	-0.005	244.
64	-0.002	-0.028	-0.006	0.050	0.013	-0.043	31.40	-0.002	-0.028	0.050	264.
65	-0.005	0.060	0.000	0.002	0.000	-0.005	89.19	-0.005	0.060	0.002	237.
66	0.001	0.043	0.040	0.007	0.044	0.001	85.42	0.001	0.043	0.007	260.
67	0.004	0.029	0.024	0.010	0.030	0.003	78.96	0.004	0.029	0.010	279.
68	0.005	0.016	0.011	0.012	0.019	0.002	65.90	0.005	0.016	0.012	296.
69	0.005	0.005	0.002	0.013	0.012	-0.002	44.91	0.005	0.005	0.013	310.
70	0.012	-0.012	-0.008	0.033	0.020	-0.020	27.15	0.012	-0.012	0.033	333.
71	-0.001	-0.002	-0.008	-0.005	0.001	-0.004	-41.57	-0.001	-0.002	-0.005	304.
72	0.008	-0.023	-0.015	0.033	0.015	-0.030	23.75	0.008	-0.023	0.033	332.
73	-0.001	-0.022	-0.012	0.019	0.003	-0.025	21.22	-0.001	-0.022	0.019	309.
74	-0.003	0.073	0.094	0.002	0.073	-0.003	89.32	-0.003	0.073	0.002	250.
75	0.005	0.053	0.066	0.006	0.053	0.005	86.40	0.005	0.053	0.006	281.
76	0.009	0.036	0.043	0.009	0.037	0.009	80.79	0.009	0.036	0.009	307.
77	0.011	0.022	0.025	0.011	0.024	0.009	67.18	0.011	0.022	0.011	330.
78	0.011	0.009	0.010	0.012	0.016	0.004	41.38	0.011	0.009	0.012	350.
79	0.020	-0.009	-0.002	0.022	0.024	-0.013	18.96	0.020	-0.009	0.022	377.
80	0.000	0.001	-0.010	0.002	0.002	-0.000	54.62	0.000	0.001	0.002	360.

EL	EPSR	EPSZ	EPST	EPSRZ	EPSMAX	EPSMIN	ANGLE	EPSP	EPSN	EPSMN	TEMPERATURE
81	0.015	-0.021	-0.017	0.025	0.019	-0.025	17.67	0.015	-0.021	0.025	389.
82	0.004	-0.018	-0.021	0.013	0.006	-0.020	15.04	0.004	-0.018	0.013	377.
83	-0.001	-0.017	-0.022	0.014	0.002	-0.020	19.69	-0.001	-0.017	0.014	368.
84	-0.001	0.081	0.133	0.000	0.081	-0.001	89.54	-0.001	0.081	0.000	258.
85	0.011	0.059	0.097	0.002	0.059	0.011	88.97	0.011	0.059	0.002	294.
86	0.016	0.041	0.069	0.003	0.041	0.016	86.50	0.016	0.041	0.003	325.
87	0.019	0.026	0.046	0.004	0.027	0.018	74.65	0.019	0.026	0.004	352.
88	0.019	0.014	0.028	0.006	0.020	0.012	23.58	0.019	0.014	0.006	376.
89	0.028	-0.004	0.013	0.008	0.029	-0.005	7.23	0.028	-0.004	0.008	404.
90	0.007	0.004	-0.001	0.005	0.008	0.002	29.70	0.007	0.004	0.005	397.
91	0.021	-0.018	-0.009	0.016	0.023	-0.019	11.04	0.021	-0.018	0.016	425.
92	0.009	-0.016	-0.019	0.012	0.011	-0.017	12.93	0.009	-0.016	0.012	425.
93	0.004	-0.019	-0.030	0.013	0.006	-0.020	14.93	0.004	-0.019	0.013	430.
94	0.000	-0.013	-0.031	0.008	0.002	-0.014	16.62	0.000	-0.013	0.008	424.
95	0.002	0.079	0.171	-0.004	0.079	0.002	-88.62	0.002	0.079	-0.004	263.
96	0.016	0.059	0.130	-0.007	0.059	0.016	-85.56	0.016	0.059	-0.007	301.
97	0.024	0.042	0.098	-0.008	0.042	0.023	-77.53	0.024	0.042	-0.008	334.
98	0.027	0.028	0.072	-0.009	0.032	0.023	-45.22	0.027	0.028	-0.009	364.
99	0.028	0.016	0.050	-0.008	0.030	0.015	-17.03	0.028	0.016	-0.008	390.
100	0.037	-0.000	0.034	-0.012	0.038	-0.001	-8.93	0.037	-0.000	-0.012	417.
101	0.015	0.007	0.017	0.000	0.015	0.007	1.13	0.015	0.007	0.000	417.
102	0.029	-0.014	0.008	-0.000	0.029	-0.014	-0.17	0.029	-0.014	-0.000	444.
103	0.016	-0.011	-0.008	0.005	0.017	-0.011	5.31	0.016	-0.011	0.005	452.
104	0.009	-0.017	-0.026	0.011	0.010	-0.018	11.18	0.009	-0.017	0.011	469.
105	0.003	-0.017	-0.035	0.011	0.005	-0.018	14.77	0.003	-0.017	0.011	475.
106	0.000	-0.008	-0.037	0.005	0.001	-0.009	15.94	0.000	-0.008	0.005	471.
107	0.004	0.065	0.205	-0.009	0.066	0.004	-85.99	0.004	0.065	-0.009	265.
108	0.022	0.049	0.160	-0.015	0.051	0.020	-75.10	0.022	0.049	-0.015	304.
109	0.033	0.035	0.125	-0.019	0.043	0.024	-47.81	0.033	0.035	-0.019	338.
110	0.039	0.023	0.097	-0.022	0.044	0.018	-27.26	0.039	0.023	-0.022	369.
111	0.041	0.014	0.073	-0.023	0.046	0.010	-19.95	0.041	0.014	-0.023	396.
112	0.036	-0.005	0.052	-0.028	0.059	-0.008	-12.39	0.056	-0.005	-0.028	428.
113	0.025	0.009	0.037	-0.018	0.029	0.005	-24.43	0.025	0.009	-0.018	430.
114	0.042	-0.010	0.027	-0.017	0.043	-0.011	-8.94	0.042	-0.010	-0.017	454.
115	0.028	-0.006	0.010	-0.009	0.028	-0.007	-7.88	0.028	-0.006	-0.009	465.
116	0.017	-0.012	-0.013	0.000	0.017	-0.012	0.14	0.017	-0.012	0.000	490.
117	0.009	-0.015	-0.029	0.008	0.009	-0.016	8.77	0.009	-0.015	0.008	505.
118	0.003	-0.013	-0.038	0.010	0.004	-0.014	16.36	0.003	-0.013	0.010	512.
119	-0.000	-0.005	-0.040	0.004	0.001	-0.006	21.14	-0.000	-0.005	0.004	509.
120	0.006	0.048	0.221	-0.006	0.049	0.006	-85.76	0.006	0.048	-0.006	268.

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EL	EPSR	EPSZ	EPST	EPSRZ	EPSMAX	EPSMIN	ANGLE	EPSM	EPSN	EPSMN	TEMPERATURE
121	0.028	0.035	0.174	-0.010	0.038	0.026	-61.56	0.028	0.035	-0.010	308.
122	0.043	0.023	0.138	-0.015	0.046	0.021	-18.36	0.043	0.023	-0.015	343.
123	0.053	0.013	0.108	-0.020	0.055	0.011	-13.47	0.053	0.013	-0.020	375.
124	0.059	0.005	0.084	-0.026	0.062	0.002	-12.93	0.059	0.005	-0.026	403.
125	0.082	-0.013	0.062	-0.038	0.086	-0.016	-10.88	0.082	-0.013	-0.038	436.
126	0.036	0.008	0.051	-0.022	0.040	0.004	-19.04	0.036	0.008	-0.022	440.
127	0.069	-0.013	0.036	-0.031	0.072	-0.016	-10.36	0.069	-0.013	-0.031	467.
128	0.046	-0.001	0.026	-0.023	0.049	-0.004	-13.11	0.046	-0.001	-0.023	474.
129	0.035	-0.005	0.006	-0.016	0.036	-0.006	-10.98	0.035	-0.005	-0.016	496.
130	0.023	-0.009	-0.014	-0.004	0.023	-0.009	-3.59	0.023	-0.009	-0.004	519.
131	0.012	-0.011	-0.029	0.004	0.012	-0.011	5.56	0.012	-0.011	0.004	533.
132	0.004	-0.009	-0.037	0.008	0.005	-0.010	16.22	0.004	-0.009	0.008	540.
133	-0.001	-0.004	-0.040	0.005	0.001	-0.005	30.14	-0.001	-0.004	0.005	539.
134	0.005	0.053	0.203	0.010	0.054	0.004	83.59	0.005	0.053	0.010	278.
135	0.026	0.033	0.153	0.016	0.038	0.021	58.38	0.026	0.033	0.016	326.
136	0.039	0.015	0.113	0.014	0.041	0.013	15.36	0.039	0.015	0.014	368.
137	0.048	-0.000	0.081	0.008	0.048	-0.001	4.64	0.048	-0.000	0.008	405.
138	0.054	-0.011	0.055	-0.003	0.054	-0.011	-1.29	0.054	-0.011	-0.003	439.
139	0.089	-0.039	0.022	-0.029	0.091	-0.041	-6.30	0.089	-0.039	-0.029	485.
140	0.037	0.008	0.043	-0.018	0.040	0.005	-15.92	0.037	0.008	-0.018	462.
141	0.099	-0.027	0.013	-0.033	0.101	-0.029	-7.42	0.099	-0.027	-0.033	506.
142	0.039	0.015	0.026	-0.031	0.047	0.007	-25.97	0.039	0.015	-0.031	487.
143	0.083	-0.013	0.005	-0.022	0.084	-0.015	-6.49	0.083	-0.013	-0.022	523.
144	0.041	0.012	0.014	-0.036	0.049	0.003	-25.98	0.041	0.012	-0.036	504.
145	0.069	-0.007	-0.001	-0.007	0.069	-0.008	-2.78	0.069	-0.007	-0.007	533.
146	0.044	0.001	-0.002	-0.013	0.045	0.000	-8.34	0.044	0.001	-0.013	529.
147	0.034	-0.005	-0.014	-0.005	0.034	-0.005	-3.63	0.034	-0.005	-0.005	544.
148	0.021	-0.007	-0.026	0.001	0.021	-0.007	0.68	0.021	-0.007	0.001	555.
149	0.010	-0.006	-0.033	0.003	0.010	-0.006	5.77	0.010	-0.006	0.003	561.
150	0.001	-0.003	-0.037	0.003	0.002	-0.004	19.60	0.001	-0.003	0.003	561.
151	-0.000	0.084	0.160	0.020	0.085	-0.001	83.15	-0.000	0.084	0.020	289.
152	0.012	0.047	0.108	0.030	0.052	0.007	69.82	0.012	0.047	0.030	344.
153	0.017	0.014	0.066	0.032	0.032	-0.000	42.40	0.017	0.014	0.032	392.
154	0.018	-0.015	0.031	0.028	0.023	-0.020	20.55	0.018	-0.015	0.028	435.
155	0.015	-0.040	0.001	0.018	0.017	-0.042	8.89	0.015	-0.040	0.018	474.
156	-0.002	-0.067	-0.026	-0.040	0.003	-0.072	-16.08	-0.002	-0.067	-0.040	511.
157	0.022	-0.040	-0.018	0.022	0.023	-0.042	9.88	0.022	-0.040	0.022	524.
158	0.090	-0.011	-0.027	-0.037	0.093	-0.014	-10.11	0.090	-0.011	-0.037	556.
159	0.086	-0.008	-0.032	-0.062	0.095	-0.017	-16.66	0.086	-0.008	-0.062	579.
160	0.049	0.020	-0.039	-0.003	0.049	0.019	-2.64	0.049	0.020	-0.003	603.

EL	EPSR	EPSZ	EPST	EPSRZ	EPSMAX	EPSMIN	ANGLE	EPSM	EPSN	EPSMN	TEMPERATURE
161	0.065	0.002	-0.016	-0.064	0.078	-0.011	-22.86	0.065	0.002	-0.064	563.
162	0.044	0.016	-0.019	-0.044	0.057	0.004	-28.91	0.044	0.016	-0.044	567.
163	0.043	-0.011	-0.034	0.001	0.043	-0.011	0.52	0.043	-0.011	0.001	598.
164	0.038	-0.005	-0.025	-0.014	0.039	-0.006	-9.05	0.038	-0.005	-0.014	581.
165	0.028	-0.007	-0.028	-0.009	0.029	-0.008	-7.27	0.028	-0.007	-0.009	583.
166	0.018	-0.005	-0.031	-0.007	0.018	-0.006	-8.87	0.018	-0.005	-0.007	583.
167	0.007	-0.000	-0.032	-0.006	0.008	-0.001	-18.97	0.007	-0.000	-0.006	581.
168	-0.002	0.100	0.124	-0.001	0.100	-0.002	-89.60	-0.002	0.100	-0.001	291.
169	0.006	0.052	0.075	-0.002	0.052	0.006	-88.92	0.006	0.052	-0.002	346.
170	0.008	0.008	0.036	-0.005	0.010	0.005	-43.47	0.008	0.008	-0.005	395.
171	0.006	-0.036	0.002	-0.011	0.006	-0.037	-7.16	0.006	-0.036	-0.011	439.
172	0.002	-0.084	-0.027	-0.020	0.003	-0.085	-6.59	0.002	-0.084	-0.020	478.
173	0.062	-0.009	-0.048	-0.058	0.072	-0.020	-19.75	0.062	-0.009	-0.058	631.
174	0.047	0.004	-0.042	-0.058	0.062	-0.011	-26.72	0.047	0.004	-0.058	623.
175	0.022	-0.008	-0.041	-0.019	0.025	-0.011	-16.14	0.022	-0.008	-0.019	637.
176	0.027	-0.009	-0.037	-0.027	0.032	-0.013	-18.26	0.027	-0.009	-0.027	633.
177	0.023	-0.009	-0.035	-0.021	0.026	-0.012	-16.74	0.023	-0.009	-0.021	616.
178	0.018	-0.004	-0.033	-0.020	0.022	-0.008	-20.98	0.018	-0.004	-0.020	611.
179	0.012	0.006	-0.032	-0.020	0.019	-0.001	-37.05	0.012	0.006	-0.020	605.
180	-0.001	0.091	0.110	-0.007	0.091	-0.002	-87.83	-0.001	0.091	-0.007	291.
181	0.008	0.046	0.063	-0.011	0.047	0.007	-82.08	0.008	0.046	-0.011	345.
182	0.012	0.004	0.025	-0.012	0.015	0.001	-28.75	0.012	0.004	-0.012	394.
183	0.012	-0.035	-0.007	-0.010	0.013	-0.036	-5.99	0.012	-0.035	-0.010	437.
184	0.011	-0.071	-0.034	-0.004	0.011	-0.071	-1.29	0.011	-0.071	-0.004	476.
185	0.010	-0.008	-0.032	-0.023	0.016	-0.014	-26.93	0.010	-0.008	-0.024	648.
186	0.012	-0.012	-0.033	-0.023	0.017	-0.016	-22.49	0.012	-0.012	-0.023	645.
187	0.014	-0.008	-0.033	-0.025	0.019	-0.014	-24.62	0.014	-0.008	-0.025	640.
188	0.013	0.001	-0.032	-0.027	0.022	-0.008	-32.81	0.013	0.001	-0.027	635.
189	0.010	0.016	-0.031	-0.029	0.028	-0.002	-50.60	0.010	0.016	-0.029	629.
190	-0.001	0.081	0.109	-0.003	0.081	-0.001	-88.81	-0.001	0.081	-0.003	291.
191	0.008	0.041	0.062	-0.006	0.041	0.008	-84.92	0.008	0.041	-0.006	345.
192	0.012	0.004	0.024	-0.006	0.013	0.003	-18.41	0.012	0.004	-0.006	394.
193	0.012	-0.031	-0.008	-0.005	0.013	-0.031	-3.49	0.012	-0.031	-0.005	437.
194	0.010	-0.063	-0.035	-0.003	0.010	-0.064	-1.29	0.010	-0.063	-0.003	476.
195	-0.004	-0.015	-0.015	-0.002	-0.004	-0.016	-6.25	-0.004	-0.015	-0.002	650.
196	0.003	-0.010	-0.019	-0.013	0.006	-0.013	-22.58	0.003	-0.010	-0.013	649.
197	0.007	-0.003	-0.021	-0.018	0.012	-0.008	-31.27	0.007	-0.003	-0.013	648.
198	0.009	0.008	-0.023	-0.024	0.020	-0.004	-43.86	0.009	0.008	-0.024	647.
199	0.011	0.025	-0.024	-0.036	0.037	-0.001	-55.16	0.011	0.025	-0.036	644.
200	-0.001	0.076	0.111	-0.001	0.076	-0.001	-89.59	-0.001	0.076	-0.001	291.

EL	EPSR	EPSZ	EPST	EPSRZ	EPSMAX	EPSMIN	ANGLE	EPSM	EPSN	EPSMN	TEMPERATURE
201	C.C08	0.038	C.C64	-0.C02	C.038	C.C08	-88.C2	C.C08	C.038	-0.002	345.
202	0.012	0.003	C.C26	-0.C02	C.C12	C.003	-7.68	C.C12	C.003	-0.002	394.
203	C.C12	-C.029	-C.C06	-0.C02	C.C12	-0.029	-1.43	C.C12	-C.029	-C.C02	437.
204	0.C10	-C.C60	-C.C34	-C.C01	C.C1C	-0.C60	-0.45	0.C1C	-C.C60	-C.001	476.
205	-0.008	-0.013	C.C03	0.C04	-C.CC8	-C.C14	18.21	-C.CC8	-C.C13	C.C04	649.
206	-0.C04	-0.004	-C.C01	-0.C04	-0.C02	-0.C06	-39.74	-C.CC4	-C.CC4	-C.004	649.
207	0.CC0	0.CC4	-C.C04	-C.C11	C.CC8	-0.C03	-55.21	0.CC0	C.C04	-0.011	649.
208	0.004	0.014	-C.C07	-C.C18	C.C19	-C.C01	-59.35	0.C04	0.014	-0.018	649.
209	0.C08	0.023	-0.C09	-0.028	0.C31	-0.C01	-59.59	C.CC8	C.C23	-C.028	648.
210	-C.C01	0.C75	0.113	-0.C00	0.C75	-C.C01	-89.97	-C.C01	C.C75	-0.000	291.
211	0.CC8	0.038	C.C66	-C.CC0	0.C38	C.CC8	-89.75	C.C08	0.038	-0.000	345.
212	0.012	0.003	C.028	-0.C00	0.C12	0.C03	-0.99	C.C12	C.C03	-0.000	394.
213	0.012	-0.029	-C.C04	-0.000	0.012	-0.029	-C.16	C.C12	-C.029	-0.000	437.
214	0.C10	-0.058	-C.C32	-C.CC0	0.C1C	-0.C5E	-C.03	C.C10	-0.058	-0.000	476.
215	-0.010	-0.CC6	C.C16	C.004	-0.CC5	-0.011	69.61	-C.C1C	-C.CC6	0.004	649.
216	-0.007	0.C02	C.C13	-C.001	0.CC2	-0.C07	-86.98	-C.CC7	C.C02	-C.C01	649.
217	-0.CC4	0.C09	C.C1C	-C.CC6	0.C1C	-0.C05	-77.79	-0.C04	0.C09	-C.006	649.
218	-0.CC0	0.015	C.C08	-C.012	0.C17	-0.C02	-71.44	-C.CCC	C.C15	-0.012	648.
219	0.004	0.021	C.CC6	-0.020	0.026	-0.C01	-65.68	C.CC4	C.C21	-0.020	648.
220	-C.C01	0.C75	C.115	C.CC0	0.C75	-C.C01	89.92	-C.C01	C.C75	C.CC0	291.
221	0.C08	0.038	C.C67	0.CC0	0.C38	0.C08	89.67	0.C08	C.038	0.000	345.
222	0.C12	0.003	0.C29	0.000	0.C12	0.C03	1.16	C.C12	C.C03	0.CC0	394.
223	0.C12	-0.029	-C.C03	0.000	0.012	-0.C29	0.23	0.C12	-0.029	0.CC0	437.
224	0.C10	-C.C58	-C.C31	0.CCC	0.C1C	-C.058	C.09	0.C10	-0.058	0.000	476.
225	-0.C10	-0.CC0	C.C20	0.C01	-0.CCC	-0.C1C	87.51	-C.C1C	-C.CC0	0.001	649.
226	-0.C08	0.C07	C.C18	-0.C02	0.C07	-0.C08	-85.95	-0.CC8	C.C07	-0.002	649.
227	-0.C05	0.C12	C.C16	-C.C05	0.C12	-0.C06	-81.56	-0.C05	C.C12	-0.005	649.
228	-0.002	0.015	C.C14	-0.009	0.C16	-C.C03	-77.CC	-C.CC2	C.C15	-0.009	649.
229	0.001	0.C17	C.C13	-0.012	0.019	-0.C01	-71.72	C.C01	0.C17	-C.012	648.
230	-0.C01	0.C75	C.115	C.CC0	0.C75	-0.C01	89.92	-0.C01	C.C75	0.CC0	291.
231	0.C08	0.038	C.C68	0.CC0	0.C38	0.C08	89.67	0.C08	C.038	0.000	345.
232	0.C12	0.003	0.C29	0.000	0.C12	C.003	1.16	C.C12	C.C03	0.CC0	394.
233	0.C12	-0.029	-C.C03	C.CC0	0.C12	-0.029	0.22	0.C12	-0.029	0.000	437.
234	0.C10	-0.059	-C.C31	C.CC0	C.C1C	-0.059	C.08	0.C10	-0.059	0.000	476.
235	-0.C09	0.003	C.C23	-0.001	0.C03	-0.C09	-86.84	-C.CC9	C.C03	-C.001	649.
236	-C.C07	C.C07	C.C21	-0.001	0.C07	-0.C07	-88.67	-C.CC7	C.C07	-C.001	649.
237	-0.C05	0.C11	C.C19	-C.C02	0.C11	-0.C05	-86.90	-0.C05	0.C11	-0.002	649.
238	-0.C03	0.014	C.C18	-0.003	0.014	-0.C03	-84.68	-C.C03	C.C14	-0.003	649.
239	-0.001	0.016	C.C17	-0.004	0.C17	-0.C01	-83.03	-C.C01	C.C16	-C.004	649.
240	-0.C01	0.C76	C.115	0.CC0	0.C76	-0.C01	89.96	-0.C01	0.C76	0.000	291.

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EL	EPSR	EPSZ	EPST	EPSRZ	EPSMAX	EPSMIN	ANGLE	EPSM	EPSN	EPSMN	TEMPERATURE
241	C.CC8	0.038	C.C68	C.CCO	C.038	C.CC8	89.82	0.CC8	C.038	0.CCC	345.
242	0.012	0.003	0.C29	C.CCO	0.C12	C.C03	C.64	C.C12	C.003	0.000	394.
243	0.012	-0.029	-C.C03	0.000	0.C12	-C.C29	C.12	C.C12	-C.C29	C.CCC	437.
244	0.010	-0.059	-C.C31	0.000	0.C1C	-0.059	C.04	C.C1C	-C.C59	C.CCC	476.
245	-C.CC8	0.CC5	C.C28	-C.CCO	0.CC5	-C.CC8	-89.7C	-C.CC8	C.CC5	-C.CCO	650.
246	-0.006	0.CC7	C.C26	C.C01	C.CC7	-0.C06	88.66	-C.CC6	C.CC7	0.001	649.
247	-C.CC4	C.C10	0.C25	0.001	0.010	-0.004	88.28	-C.CC4	C.C1C	0.C01	649.
248	-0.002	0.013	C.C23	C.C01	0.C13	-0.C02	88.63	-0.CC2	0.013	0.001	649.
249	-0.001	0.016	C.C22	C.C01	0.C16	-C.C01	89.13	-C.CC1	C.016	0.C01	649.
250	-0.001	C.076	C.115	0.CCO	0.C76	-C.CC1	89.99	-C.CC1	C.C76	C.CCC	291.
251	0.008	C.038	C.C68	C.CCO	C.038	0.C08	89.94	C.CC8	C.038	C.000	345.
252	0.012	0.003	C.029	C.CCO	0.C12	C.C03	C.20	C.C12	C.CC3	0.CCO	394.
253	0.012	-0.029	-C.C03	C.CCO	0.012	-0.029	C.C4	C.C12	-0.C29	C.CCC	437.
254	C.C10	-0.059	-C.C31	C.CCO	0.C1C	-0.059	C.01	C.C1C	-C.C59	0.CCO	476.
255	-0.008	0.CC6	C.C32	0.CC1	C.CC6	-C.CC8	87.54	-0.CC8	0.CC6	0.C01	650.
256	-0.005	0.008	C.C30	0.002	0.CC8	-0.C06	85.52	-C.CC5	C.CC8	C.C02	649.
257	-C.CC4	C.010	C.028	0.002	0.011	-0.004	85.21	-0.C04	C.C1C	C.C02	649.
258	-C.CC2	C.C13	C.C27	0.C02	C.C13	-C.C02	86.65	-0.C02	C.013	0.C02	649.
259	-0.001	0.015	0.C26	0.001	0.C15	-C.C01	87.83	-C.CC1	C.C15	0.001	649.
260	-C.C01	0.076	0.115	-0.CCO	0.076	-0.001	C.0	-C.CC1	C.C76	-0.CCO	291.
261	0.008	0.038	C.C68	-C.CCO	0.038	0.C08	0.0	0.CC8	0.038	-0.000	345.
262	0.012	0.003	0.C29	-C.CCO	0.012	0.C03	C.C	C.C12	C.C03	-0.000	394.
263	0.012	-0.029	-C.C03	-0.000	0.012	-0.029	C.0	0.C12	-C.C29	-0.000	437.
264	0.010	-0.059	-C.C31	-C.CCO	0.C1C	-0.059	C.0	0.C10	-0.059	-C.CCO	476.
265	-0.008	C.CC8	C.C34	0.C01	C.CC8	-C.C08	88.29	-0.CC8	C.CC8	0.001	649.
266	-0.005	0.009	0.031	C.C01	0.CC9	-0.C06	87.12	-0.CC5	C.CC9	C.C01	649.
267	-C.C04	C.011	C.C30	C.C02	0.C11	-0.004	86.68	-0.C04	0.011	0.C02	649.
268	-0.002	0.012	C.028	C.C01	0.C12	-0.C02	87.01	-0.C02	0.012	0.C01	649.
269	-0.001	0.013	0.C27	0.001	0.C13	-C.C01	88.09	-C.CC1	C.013	C.C01	649.
270	-C.C01	0.076	0.115	-0.000	0.076	-0.C01	0.0	-0.CC1	C.076	-0.000	291.
271	0.008	0.038	C.C68	-0.CCO	0.038	C.C08	-89.97	C.CC8	0.038	-0.000	345.
272	0.012	0.003	0.C29	-0.000	0.C12	0.C03	-C.11	C.C12	C.C03	-0.000	394.
273	C.C12	-0.C29	-C.C03	-0.000	C.012	-0.029	-C.02	C.C12	-C.C29	-C.CCC	437.
274	0.010	-0.059	-C.C31	-0.CCO	0.C10	-0.059	-0.01	C.C10	-0.059	-0.000	476.
275	-0.008	0.010	C.034	C.C01	0.C1C	-C.C08	89.11	-C.CC8	C.010	0.C01	649.
276	-0.005	0.010	0.031	0.001	0.010	-0.005	88.41	-C.CC5	C.C1C	C.C01	649.
277	-0.004	0.C11	C.C30	C.C01	0.C11	-0.004	88.06	-0.C04	C.011	0.C01	649.
278	-0.002	0.011	0.C28	0.001	0.C11	-0.C02	88.16	-0.C02	0.011	0.001	649.
279	-0.001	0.012	C.027	0.001	0.012	-0.C01	88.79	-C.CC1	C.012	C.C01	649.
280	-0.C01	0.076	C.115	0.000	0.C76	-0.C01	C.0	-C.CC1	0.C76	0.000	291.

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EL	EPSR	EPSZ	EPST	EPSRZ	EPSMAX	EPSMIN	ANGLE	EPSM	EPSN	EPSMN	TEMPERATURE
281	0.008	0.038	0.068	0.000	0.038	0.008	0.0	0.008	0.038	0.000	345.
282	0.012	0.003	0.029	0.000	0.012	0.003	0.0	0.012	0.003	0.000	394.
283	0.012	-0.029	-0.003	0.000	0.012	-0.029	0.0	0.012	-0.029	0.000	437.
284	0.010	-0.059	-0.031	-0.000	0.010	-0.059	0.0	0.010	-0.059	-0.000	476.
285	-0.008	0.010	0.033	0.000	0.010	-0.008	89.66	-0.008	0.010	0.000	649.
286	-0.005	0.011	0.031	0.000	0.011	-0.005	89.36	-0.005	0.011	0.000	649.
287	-0.004	0.011	0.029	0.000	0.011	-0.004	89.19	-0.004	0.011	0.000	649.
288	-0.002	0.011	0.028	0.000	0.011	-0.002	89.22	-0.002	0.011	0.000	649.
289	-0.001	0.011	0.026	0.000	0.011	-0.001	89.49	-0.001	0.011	0.000	649.
290	-0.001	0.076	0.115	0.000	0.076	-0.001	89.97	-0.001	0.076	0.000	291.
291	0.008	0.038	0.067	0.000	0.038	0.008	89.88	0.008	0.038	0.000	345.
292	0.012	0.003	0.029	0.000	0.012	0.003	0.43	0.012	0.003	0.000	394.
293	0.012	-0.029	-0.003	0.000	0.012	-0.029	0.08	0.012	-0.029	0.000	437.
294	0.010	-0.059	-0.031	0.000	0.010	-0.059	0.02	0.010	-0.059	0.000	476.
295	-0.008	0.011	0.033	0.000	0.011	-0.008	89.94	-0.008	0.011	0.000	649.
296	-0.005	0.011	0.031	0.000	0.011	-0.005	89.86	-0.005	0.011	0.000	649.
297	-0.004	0.011	0.029	0.000	0.011	-0.004	89.82	-0.004	0.011	0.000	649.
298	-0.002	0.011	0.027	0.000	0.011	-0.002	89.83	-0.002	0.011	0.000	649.
299	-0.001	0.011	0.026	0.000	0.011	-0.001	89.91	-0.001	0.011	0.000	649.
300	-0.001	0.076	0.115	0.000	0.076	-0.001	89.93	-0.001	0.076	0.000	291.
301	0.008	0.038	0.067	0.000	0.038	0.008	89.69	0.008	0.038	0.000	345.
302	0.012	0.003	0.029	0.000	0.012	0.003	1.12	0.012	0.003	0.000	394.
303	0.012	-0.029	-0.003	0.000	0.012	-0.029	0.21	0.012	-0.029	0.000	437.
304	0.010	-0.059	-0.031	0.000	0.010	-0.059	0.07	0.010	-0.059	0.000	476.
305	-0.008	0.011	0.033	-0.000	0.011	-0.008	0.0	-0.008	0.011	-0.000	649.
306	-0.005	0.011	0.030	-0.000	0.011	-0.005	-89.96	-0.005	0.011	-0.000	649.
307	-0.004	0.011	0.029	-0.000	0.011	-0.004	-89.96	-0.004	0.011	-0.000	649.
308	-0.002	0.011	0.027	-0.000	0.011	-0.002	-89.95	-0.002	0.011	-0.000	649.
309	-0.001	0.011	0.026	-0.000	0.011	-0.001	0.0	-0.001	0.011	-0.000	649.
310	-0.001	0.077	0.115	0.000	0.077	-0.001	89.88	-0.001	0.077	0.000	291.
311	0.008	0.039	0.068	0.001	0.039	0.008	89.51	0.008	0.039	0.001	345.
312	0.012	0.003	0.029	0.001	0.012	0.003	1.80	0.012	0.003	0.001	394.
313	0.012	-0.029	-0.003	0.000	0.012	-0.029	0.34	0.012	-0.029	0.000	437.
314	0.010	-0.060	-0.031	0.000	0.010	-0.060	0.12	0.010	-0.060	0.000	476.
315	-0.008	0.011	0.032	-0.000	0.011	-0.008	0.0	-0.008	0.011	-0.000	649.
316	-0.005	0.011	0.030	-0.000	0.011	-0.005	0.0	-0.005	0.011	-0.000	649.
317	-0.004	0.011	0.029	-0.000	0.011	-0.004	0.0	-0.004	0.011	-0.000	649.
318	-0.002	0.011	0.027	-0.000	0.011	-0.002	0.0	-0.002	0.011	-0.000	649.
319	-0.001	0.011	0.026	-0.000	0.011	-0.001	0.0	-0.001	0.011	-0.000	649.
320	-0.001	0.077	0.116	0.000	0.077	-0.001	89.90	-0.001	0.077	0.000	291.

EL	EPSR	EPSZ	EPST	EPSRZ	EPSMAX	EPSMIN	ANGLE	EPSM	EPSN	EPSMN	TEMPERATURE
321	0.008	0.039	C.C68	C.CCO	0.C39	C.CC8	89.66	C.CC8	C.C3S	0.CCO	345.
322	0.012	0.C03	C.C30	0.CCO	0.C12	0.C03	1.23	C.C12	C.CC3	C.CCC	394.
323	0.012	-C.C3C	-C.CC3	C.CCO	0.012	-0.030	0.25	C.C12	-C.C3C	C.CCC	437.
324	0.010	-0.C60	-C.C31	C.CCO	0.C1C	-C.C6C	0.11	C.C1C	-C.C6C	C.CCO	476.
325	-0.C01	0.077	0.118	-C.CCO	0.077	-C.C01	-89.86	-C.CC1	C.C77	-C.CCC	291.
326	C.C09	0.C39	C.C70	-C.C01	0.C39	0.C09	-89.20	0.CC9	C.C39	-C.C01	345.
327	0.C12	0.C03	C.C31	-C.C01	0.C12	C.C03	-3.08	0.C12	0.C03	-0.001	394.
328	0.012	-0.029	-0.C01	-0.001	0.C12	-C.C29	-C.53	C.C12	-C.C29	-0.CC1	437.
329	C.C10	-C.C60	-C.C29	-C.CCO	0.C1C	-0.C6C	-C.14	0.C1C	-0.C6C	-C.CCC	476.
330	-0.001	C.C74	C.121	-C.C02	0.C74	-C.C01	-89.13	-C.C01	0.074	-0.002	291.
331	0.C09	0.037	C.C73	-C.C04	0.037	C.CC9	-85.87	C.CC9	C.037	-0.C04	345.
332	0.C12	C.C03	C.C34	-0.005	0.C13	C.C03	-13.18	C.C12	C.CC3	-C.CC5	394.
333	0.012	-C.C28	C.CC1	-C.C04	C.C13	-0.028	-2.75	C.C12	-0.C28	-0.004	437.
334	0.010	-0.C58	-C.C27	-C.C02	C.C1C	-C.C58	-C.89	C.C1C	-C.C58	-0.C02	476.
335	-0.001	0.066	0.124	-C.C06	0.C66	-0.C01	-87.57	-C.CC1	C.C66	-0.CC6	291.
336	C.CC9	0.C32	C.C76	-C.C10	0.C33	0.C08	-78.80	0.CC9	0.032	-0.C10	345.
337	0.C13	C.C02	C.C36	-C.C11	0.C15	C.CCC	-23.32	0.C13	C.C02	-0.C11	394.
338	0.013	-0.025	0.C03	-0.009	0.C13	-0.C26	-7.C5	0.C13	-C.C25	-0.CC9	437.
339	0.C10	-0.C51	-C.C25	-0.C06	0.C1C	-0.051	-2.58	0.C1C	-0.C51	-0.C06	476.
340	-0.001	0.051	0.119	-0.C10	0.C51	-C.C01	-84.37	-0.CC1	0.051	-0.010	291.
341	0.009	0.025	0.C71	-0.015	0.028	0.CC6	-68.41	C.CC9	C.C25	-0.015	345.
342	0.C12	C.C01	C.C32	-0.016	0.016	-0.003	-28.09	0.C12	0.C01	-0.016	394.
343	0.012	-0.C20	-C.CCC	-C.C14	0.C13	-0.021	-12.C3	0.012	-0.020	-0.014	437.
344	0.010	-0.038	-C.C28	-0.CC9	0.C10	-0.C39	-5.55	0.C1C	-C.C38	-0.009	476.
345	-0.C02	0.C34	C.C93	-C.CC	0.034	-0.002	-89.57	-0.CC2	0.C34	-0.CC1	291.
346	0.C07	0.C14	C.C48	-C.C15	0.C19	0.C02	-57.19	0.CC7	0.014	-0.015	345.
347	0.012	0.CCO	0.C11	-0.C18	C.C17	-C.C05	-29.C1	C.C12	C.CCO	-0.018	394.
348	0.013	-0.012	-0.C20	-0.012	0.C14	-0.013	-13.44	0.C13	-C.C12	-0.C12	437.
349	0.C10	-0.025	-C.C46	C.C02	0.C11	-0.026	1.20	0.010	-0.025	0.C02	476.

*****
TIME REMAINING AT END OF SOLUTION FOR TIME STEP 1 OF CASE 1 IS 60 SECONDS.
*****

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OVERALL TIME LOG

TRANSFER OF DATA TO UNIT 9	4.23
MESH GENERATION	0.0
ELEMENT PLOTTING	8.15
STIFNESS MATRIX FORMATION	12.93
DISPLACEMENTS	13.26
STRESSES	9.52
DEFORMED GRID AND/OR CONTOUR PLOTS	0.0

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APPENDIX D

INTENS PROGRAM SOURCE LISTING

```
      COMPILER OPTIONS - NAME=  MAIN,OPT=00,LINECNT=58,SIZE=0000K,
                         SOURCE,EBCDIC,NOLIST,NODECK,LOAD,MAP,NOEDIT,ID,NOXREF
                C
                C * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
                C
                C *  PROGRAM - -  INTENS
                C
                C *  PROGRAM WILL CALCULATE STRESS INTENSITIES FOR NB-3200 ANALYSIS
                C
                C *  PROGRAM WILL BE WRITTEN TO HANDLE 20 TRANSIENT CASES
                C
                C *  NTRAN = NO. OF TRANSIENTS
                C *  NPROB = NO. OF POINTS OR PROBLEMS,.GT.1-PROG. CONTINUES
                C *  SCON  = STRESS CONCENTRATION FACTOR
                C *  ERAT  = RATIO OF ELASTIC MODULI - SEE NB-3222.4(E)(4)
                C *  STRESS(I,J) = STRESS COMPONENT ARRAY, I= NO. OF TRANSIENT
                C *  NCY(I) = NO. OF CYCLES ARRAY
                C *  NPT = PROBLEM NUMBER
                C
                C * * N O T E - - IF R, Z, THETA COORDINATE SYSTEM IS USED, STRESS
                C                 COLUMNS HEADED X, Y, Z, AND XY CORRESPOND TO R, Z,
                C                 THETA, AND RZ STRESSES
                C
                C * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
                C
   ISN 0002           IMPLICIT REAL*8(A-H,O-Z)
   ISN 0003           COMMON STRESS(20,6),SCOM(210,6),COEF(210,4),PSTRS(210,5),
                     1       TEST(210,3),
                     2       NCOM(210,2),NCY(20)
   ISN 0004           DIMENSION SDIF(3)
   ISN 0005           CALL ECHO
   ISN 0006           READ(5,1)NPROB
   ISN 0007         1 FORMAT(I5)
   ISN 0008           WRITE(6,2)NPROB
   ISN 0009         2 FORMAT('1'/////T15,75H * * PROGRAM - - INTENS - - CALCULATION OF T
                     1RANSIENT STRESS INTENSITIES * */////T15,44H NO. OF PROBLEMS OR POIN
                     2TS TO BE ANALYZED IS,2X,I2///)
                C
                C *  INITIALIZE ARRAYS
                C
   ISN 0010         5 DO 800 I=1,210
   ISN 0011           DO 799 J=1,6
   ISN 0012       799 SCOM(I,J)=0.
   ISN 0013           DO 798 J=1,5
   ISN 0014       798 PSTRS(I,J)=0.
   ISN 0015           DO 797 J=1,4
   ISN 0016       797 COEF(I,J)=0.
   ISN 0017           TEST(I,1)=0.
   ISN 0018           TEST(I,2)=0.
   ISN 0019           TEST(I,3)=0.
   ISN 0020           NCOM(I,1)=100
   ISN 0021       800 NCOM(I,2)=100
   ISN 0022           DO 850 I=1,20
   ISN 0023           NCY(I)=0
   ISN 0024           DO 850 J=1,6
   ISN 0025       850 STRESS(I,J)=0.
```

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```
                C
                C *  READ PROBLEM NO. STRESS CONCENTRATION FACTOR,AND E RATIO
                C
ISN 0026              READ(5,3)NPT,NTRAN,SCON,ERAT
ISN 0027            3 FORMAT(2I5,2F10.0)
ISN 0028              WRITE(6,4)NPT,NTRAN,SCON,ERAT
ISN 0029            4 FORMAT('1'///T15,14H PROBLEM NO.  ,I2/T15,19H NO. OF TRANSIENTS ,
                     1I2/T15,30H STRESS CONCENTRATION FACTOR =,F10.3/T15,24H ELASTIC MOD
                     2ULUS RATIO =,F10.3///)
                C
                C *  READ ONE CARD FOR EACH TRANSIENT CASE
                C *  CARDS ARE READ IN ORDER FROM 1 TO NTRAN
                C *  EACH CARD CONTAINS NO. OF CYCLES FOR THAT TRANSIENT AND 6 STRESS
                C *  COMPONENTS.
                C *  STRESS COMPONENTS ARE READ IN ORDER: SX,SY,SZ,TXY,TXZ,TYZ
                C *  IF SAAS3 STRESS COMPONENTS, THE ORDER IS: SR,SZ,ST,TRZ
                C
ISN 0030              DO 10 I=1,NTRAN
ISN 0031           10 READ(5,6)NCY(I),(STRESS(I,J),J=1,6)
ISN 0032            6 FORMAT(I10,6F10.0)
ISN 0033              WRITE(6,7)
ISN 0034            7 FORMAT(T15,30H * * TRANSIENT STRESS DATA * *//T15,38H * * NOTE THA
                     1T STRESSES ARE IN KSI * *//T15, 17HTRANS  NO. CYCLES,
                     5                                                T38,80HSIGMA X
                     2  SIGMA Y         SIGMA Z         TAU XY          TAU XZ          TAU
                     3YZ/)
ISN 0035              DO 15 I=1,NTRAN
ISN 0036           15 WRITE(6,8)I,NCY(I),(STRESS(I,J),J=1,6)
ISN 0037            8 FORMAT(T16,I2,T22,I8,T35,F10.3,5(5X,F10.3))
                C
                C *  CALCULATE AND PRINT COMPONENT RANGES FOR ALL TRANSIENT PAIRS
                C
ISN 0038              WRITE(6,16)
ISN 0039           16 FORMAT('1'///T15,94H* * STRESS COMPONENT RANGES - NOTE THAT A TRAN
                     1SIENT NUMBER OF ZERO IMPLIES NULL CONDITIONS * *//T15, 71H* * THES
                     2E VALUES FOUND BY SUBTRACTING COMPONENTS OF THE TRANSIENT PAIRS//
                     5T5, 99H* * NOTE THAT IF AXISYMMETRIC STRESS DATA IS USED-SUCH AS S
                     6AAS3 OUTPUT-STRESS COLUMNS X,Y,Z, AND XY/T9,
                     7 50HCORRESPOND TO R,Z,T, AND RZ STRESSES, RESPECTIVELY//
                     3T5,83HTRAN. PAIR       SIG X       SIG Y       SIG Z       TAU XY
                     4     TAU XZ      TAU YZ/)
ISN 0040              N1=0
ISN 0041              M=NTRAN-1
ISN 0042              M2=NTRAN
ISN 0043              DO 20 I=1,NTRAN
ISN 0044              DO 19 J=1,6
ISN 0045           19 SCOM(I,J)=STRESS(I,J)
ISN 0046              NCOM(I,1)=I
ISN 0047              NCOM(I,2)=0
ISN 0048              WRITE(6,36)(NCOM(I,K),K=1,2),(SCOM(I,L),L=1,6)
ISN 0049           20 CONTINUE
ISN 0050           25 N1=N1+1
ISN 0051              DO 50 I=N1,M
ISN 0052              N3= I+1
ISN 0053              DO 40 J=N3,NTRAN
ISN 0054              M2=M2+1
```

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```
ISN 0055            NCOM(M2,1)=I
ISN 0056            NCOM(M2,2)=J
ISN 0057            DO 30 K=1,6
ISN 0058         30 SCOM(M2,K)=   (STRESS(I,K)-STRESS(J,K))
ISN 0059         40 WRITE(6,36)(NCOM(M2,L),L=1,2),(SCOM(M2,L2),L2=1,6)
ISN 0060         36 FORMAT(T5,2I4,T19,F10.3,5(2X,F10.3))
ISN 0061         50 CONTINUE
                 C
                 C *  CALCULATE AND PRINT COEFFICIENTS FOR TRIAXIAL STRESS EQUATION
                 C
ISN 0062            WRITE(6,58)
ISN 0063         58 FORMAT('1'/////T15, 99H* * COEFICIENTS FOR TRIAXIAL STRESS EQUATIO
                   1N - CORRELATE COLUMN HEADINGS TO FORM AX**3+BX**2+CX+D=0//T5,60HTR
                   2AN. PAIR          A              B              C              D/)
ISN 0064            DO 60 I=1,M2
ISN 0065            COEF(I,1)=1.0
ISN 0066            COEF(I,2)=-(SCOM(I,1)+SCOM(I,2)+SCOM(I,3))
ISN 0067            COEF(I,3)= SCOM(I,1)*SCOM(I,2) + SCOM(I,2)*SCOM(I,3) +
                   1 SCOM(I,1)*SCOM(I,3) - SCOM(I,6)*SCOM(I,6)-SCOM(I,4)*SCOM(I,4)
ISN 0068            COEF(I,4)= -(SCOM(I,1)*SCOM(I,2)*SCOM(I,3) + 2.*SCOM(I,6)*SCOM(I,5
                   1)*SCOM(I,4) - SCOM(I,1)*SCOM(I,6)*SCOM(I,6)
                   2-SCOM(I,2)*SCOM(I,5)*SCOM(I,5)-SCOM(I,3)*SCOM(I,4)*SCOM(I,4))
ISN 0069         60 WRITE(6,59)(NCOM(I,J),J=1,2),(COEF(I,L),L=1,4)
ISN 0070         59 FORMAT(T5,2I4,T19,F10.3,3(2X,D12.4))
                 C
                 C *  SOLVE TRIAXIAL STRESS EQUATION FOR PRINC. STRESSES OF EACH
                 C *   TRANSIENT PAIR
                 C
                 C *  FIRST DETERMINE INITIAL TEST VALUES
                 C
ISN 0071            DO 70 I=1,M2
ISN 0072            DO 65 J=I,3
ISN 0073         65 TEST(I,J)=DABS(SCOM(I,J))
ISN 0074         66 IND = 0
ISN 0075            X22=0.
ISN 0076            DO 67 L=1,2
ISN 0077            IF(TEST(I,L).LE.TEST(I,L+1))GO TO 67
ISN 0079            IND=1
ISN 0080            X22= TEST(I,L)
ISN 0081            TEST(I,L)=TEST(I,L+1)
ISN 0082            TEST(I,L+1)= X22
ISN 0083         67 CONTINUE
ISN 0084            IF(IND.EQ.1) GO TO 66
ISN 0086         69 CONTINUE
ISN 0087            G = TEST(I,3)+10.
ISN 0088            CALL TRYERR(I,G,IR)
ISN 0089            IF(IR.EQ.1) GO TO 927
                 C
                 C *  CALCULATE MAXIMUM STRESS INTENSITY
                 C
ISN 0091            SDIF(1) =DABS(PSTRS(I,1) - PSTRS(I,2))
ISN 0092            SDIF(2) =DABS(PSTRS(I,2) - PSTRS(I,3))
ISN 0093            SDIF(3) =DABS(PSTRS(I,3) - PSTRS(I,1))
ISN 0094            X22 = 0.
ISN 0095         71 IND = 0
ISN 0096            DO 68 L1=1,2
```

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```
ISN 0097          IF(SDIF(L1).LE.SDIF(L1+1)) GO TO 68
ISN 0099          IND = 1
ISN 0100          X22 = SDIF(L1)
ISN 0101          SDIF(L1) = SDIF(L1+1)
ISN 0102          SDIF(L1+1) = X22
ISN 0103       68 CONTINUE
ISN 0104          IF(IND.EQ.1) GO TO 71
ISN 0106      903 CONTINUE
ISN 0107          PSTRS(I,4) = SDIF(3)
ISN 0108          PSTRS(I,5) = PSTRS(I,4)*SCON*ERAT*0.50
ISN 0109          GO TO 70
ISN 0110      927 WRITE(6,928)(NCOM(I,L23),L23=1,2)
ISN 0111      928 FORMAT(T15,'TRAN. PAIR ',2I4,' HAS COMPLEX ROOTS IN TRIAXIAL STRES
                  1S EQUATION')
                C
                C *  NOTE PSTRS ARRAY NOW CONTAINS PRINC. STRESSES IN FIRST THREE
                C *  POSITIONS, MAXIMUM STRESS INTENSITY IN POSITION 4, AND ALTERNATING
                C *  STRESS INTENSITY MULTIPLIED BY STRESS CONC. FACTOR AND E RATIO IN
                C *  POSITION 5.
                C
ISN 0112       70 CONTINUE
ISN 0113          WRITE(6,81)
ISN 0114       81 FORMAT('1'///T15, 91H* * PRINCIPAL STRESSES, MAXIMUM STRESS INTENS
                  1ITY AND ALTERNATING STRESS INTENSITY FOLLOW* *//T15, 57H* * NOTE T
                  2HAT ALL STRESSES IN THIS PROGRAM ARE IN KSI * *//T15,109H * NOTE
                  3THAT ALTERNATING STRESS INTENSITY HAS BEEN MULTIPLIED BY STRESS CO
                  4NCENTRATION FACTOR AND E RATIO * *//T5,69HTRAN. PAIR   . SIGMA 1
                  5  SIGMA 2     SIGMA 3      S INT     ALT S.I./)
ISN 0115          DO 80 I=1,M2
ISN 0116       80 WRITE(6,82)(NCOM(I,J),J=1,2),(PSTRS(I,L),L=1,5)
ISN 0117       82 FORMAT(T5,2I4,T16,F10.3,4(2X,F10.3))
                C
                C *  ORDER ALTERNATING STRESS INTENSIES FROM MAX. TO MIN.
                C
ISN 0118          M6=M2-1
ISN 0119       90 IND=0
ISN 0120          DO 100 I=1,M6
ISN 0121          IF(PSTRS(I,5).GE.PSTRS(I+1,5))GO TO 100
ISN 0123          IND = 1
ISN 0124          X22 = PSTRS(I,5)
ISN 0125          PSTRS(I,5) = PSTRS(I+1,5)
ISN 0126          PSTRS(I+1,5)=X22
ISN 0127          IC1= NCOM(I,1)
ISN 0128          IC2= NCOM(I,2)
ISN 0129          NCOM(I,1)= NCOM(I+1,1)
ISN 0130          NCOM(I,2)= NCOM(I+1,2)
ISN 0131          NCOM(I+1,1)= IC1
ISN 0132          NCOM(I+1,2)=IC2
ISN 0133      100 CONTINUE
ISN 0134          IF(IND.EQ.1) GO TO 90
ISN 0136      937 CONTINUE
ISN 0137          WRITE(6,105)
ISN 0138      105 FORMAT('1'/////T15,58H* * ALTERNATING STRESS INTENSITIES ORDERED F
                  1ROM MAX TO MIN//T15,61H* * NOTE THAT ZERO TRANSIENT NUMBER INDICAT
                  2ES NULL CONDITIONS///T5, 46HTRAN. PAIR   SPECIFIED NO. CYCLES    A
                  3LT. S.I.//)
```

```
ISN 0139            DO 120 I=1,M2
ISN 0140            IF(NCOM(I,2).EQ.0) GO TO 117
ISN 0142            IF(NCY(NCOM(I,1)).LE.NCY(NCOM(I,2))) GO TO 117
ISN 0144            ICY = NCY(NCOM(I,2))
ISN 0145            GO TO 118
ISN 0146        117 ICY = NCY(NCOM(I,1))
ISN 0147        118 WRITE(6,119)(NCOM(I,J),J=1,2),ICY,PSTRS(1,5)
ISN 0148        119 FORMAT(T5,2I4,T22,I8,T40,F10.3)
ISN 0149        120 CONTINUE
ISN 0150            IF(NPT.GE.NPROB) GO TO 1000
ISN 0152            GO TO 5
ISN 0153       1000 STOP
ISN 0154            END
```

NAME	TAG		TYPE	ADD.	NAME	TAG		TYPE	ADD.	NAME	TAG		TYPE	ADD.	NAME	TAG		TYPE	ADD.
G	SFA		R*8	000858	I	SFA		I*4	000804	J	SFA		I*4	000808	K	SF		I*4	00080C
L	SF		I*4	000810	M	SF		I*4	000814	IR	SFA		I*4	000818	L1	SF		I*4	00081C
L2	F		I*4	000820	M2	SF		I*4	000824	M6	SF		I*4	000828	N1	SF		I*4	00082C
N3	SF		I*4	000830	ICY	SF		I*4	000834	IC1	SF		I*4	000838	IC2	SF		I*4	00083C
IRC	S		I*4	000840	L23	F		I*4	000844	NCY	SF	C	I*4	008070	NPT	SF		I*4	000848
X22	SF		R*8	000950	COEF	SF	C	R*8	002820	ECHO	SF	XF	R*8	000000	ERAT	SF		R*8	000868
NCOM	SF	C	I*4	0079E0	SCOM	SFA	C	R*8	0003C0	SCON	SF		R*8	000870	SDIF	SF		R*8	000878
TEST	SF	C	R*8	006630	NPROB	SF		I*4	000840	NTRAN	SF		I*4	000850	PSTRS	SFA	C	R*8	004560
IBCOM#	F	XF	R*8	000000	STRESS	SF	C	R*8	000000	TRYERR	SF	XF	R*8	000000					

***** COMMON INFORMATION *****

NAME OF COMMON BLOCK * * SIZE OF BLOCK 0080C0 HEXADECIMAL BYTES

VAR. NAME	TYPE	REL. ADDR.	VAR. NAME	TYPE	REL. ADDR.	VAR. NAME	TYPE	REL. ADDR.	VAR. NAME	TYPE	REL. ADDR.
STRESS	R*8	000000	SCOM	R*8	0003C0	COEF	R*8	002820	PSTRS	R*8	004560
TEST	R*8	006630	NCOM	I*4	0079E0	NCY	I*4	008070			

LABEL	ADDR	LABEL	ADDR	LABEL	ADDR	LABEL	ADDR
5	000B14	799	000B24	798	000B70	797	000BBC
800	000C6A	850	000CB8	10	000D84	15	000E24
19	000EF0	20	001000	25	001022	30	001078
40	0010FA	50	0011AE	60	0014C8	65	00158A
66	0015EC	67	0016E4	69	001708	71	0017C6
68	001844	903	001868	927	0018C2	70	00191C
80	001950	90	001A0E	100	001B30	937	001B54
117	001BEA	118	001C08	120	001C80	1000	001CAA

OPTIONS IN EFFECT NAME= MAIN,OPT=00,LINECNT=58,SIZE=0000K,

OPTIONS IN EFFECT SOURCE,EBCDIC,NOLIST,NODECK,LOAD,MAP,NOEDIT,ID,NOXREF

STATISTICS SOURCE STATEMENTS = 153 ,PROGRAM SIZE = 7384

STATISTICS NO DIAGNOSTICS GENERATED

****** END OF COMPILATION ******

```
          COMPILER OPTIONS - NAME=  MAIN,OPT=00,LINECNT=58,SIZE=0000K,
                             SOURCE,EBCDIC,NOLIST,NODECK,LOAD,MAP,NOEDIT,ID,NOXREF
ISN 0002            SUBROUTINE TRYERR(K,G,IR)
ISN 0003            IMPLICIT REAL*8(A-H,O-Z)
ISN 0004            COMMON STRESS(20,6),SCOM(210,6),COEF(210,4),PSTRS(210,5),
                   1       TEST(210,3),
                   2       NCOM(210,2),NCY(20)
                C
                C
                C * SUBROUTINE USES TRIAL AND ERROR METHOD TO FIND FIRST ROOT
                C * ADDITIONAL ROOTS FOUND FROM QUADRATIC EQUATION
                C
                C
ISN 0005            N2 = 1
ISN 0006            NSOL=0
ISN 0007            R1=0.
ISN 0008            R2=0.
ISN 0009            IR = 0
ISN 0010            IF(COEF(K,4).NE.0.D+0) GO TO 18
ISN 0012            AA = COEF(K,1)
ISN 0013            BB = COEF(K,2)
ISN 0014            CC = COEF(K,3)
ISN 0015            PSTRS(K,1) = 0.0
ISN 0016            GO TO 476
ISN 0017         18 B=1.0
ISN 0018            N=0
ISN 0019            X=G
ISN 0020         10 N=N+1
ISN 0021            Y=COEF(K,4)
ISN 0022            DO 15 I=1,3
ISN 0023            EI=I
ISN 0024            INDS = 0
ISN 0025            X1= DABS(X)
ISN 0026            IF(X.GE.0.D+0) GO TO 500
ISN 0028            INDS = 1
ISN 0029        500 Y22 = COEF(K,4-I)*X1**EI
ISN 0030            IF(INDS.EQ.1.AND.I.NE.2) Y22 = -Y22
ISN 0032         15 Y = Y + Y22
ISN 0033            R1=X
ISN 0034            CHK1 =DABS(Y)
ISN 0035            IF(CHK1.LE..1D-05)GO TO 100
ISN 0037            IF(Y.LT.0.D+0) IND=0
ISN 0039            IF(Y.GT.0.D+0) IND=1
ISN 0041            IF(N.EQ.1) IND2=IND
ISN 0043            IF(IND.NE.IND2) GO TO 70
ISN 0045            R2=R1
ISN 0046            RK=-G
ISN 0047            IF(X.EQ.RK) GO TO 150
ISN 0049            X=X-B
ISN 0050            GO TO 10
ISN 0051         70 B=0.10*B
ISN 0052            X=R2-B
ISN 0053            IND=IND2
ISN 0054            GO TO 10
ISN 0055        100 NSOL=NSOL+1
ISN 0056            PSTRS(K,NSOL) = X
```

```
ISN 0057            NC=3-NSOL
ISN 0058            IF(NC.EQ.0) GO TO 1000
ISN 0060            AA = 1.0
ISN 0061            BB = COEF(K,2)+X
ISN 0062            CC = COEF(K,3) - BB*(-X)
ISN 0063        476 C21 = (BB*BB  - 4.*AA*CC)
ISN 0064            C23 = DABS(C21)
ISN 0065            IF(C23.LT..1D-6) C21=0.D+0
ISN 0067            IF(C21.LT.0.D+0) GO TO 826
ISN 0069            PSTRS(K,2) = (-BB + DSQRT(C21))/(2.*AA)
ISN 0070            PSTRS(K,3) = (-BB - DSQRT(C21))/(2.*AA)
ISN 0071            GO TO 1000
ISN 0072        826 IR = 1
ISN 0073            GO TO 1000
ISN 0074        150 N2 = N2+1
ISN 0075            IF(N2.EQ.6) GO TO 155
ISN 0077            G = G+10.
ISN 0078            GO TO 18
ISN 0079        155 WRITE(6,200)(NCOM(K,M3),M3=1,2)
ISN 0080        200 FORMAT(//T15,'* * AFTER 6 DIFFERENT INITIAL VALUES HAVE BEEN TRIED
                   1 FOR TRANSIENT PAIR',2X,2I4)
ISN 0081            WRITE(6,151)
ISN 0082        151 FORMAT(//T10,'NO ADDITIONAL ROOTS WERE FOUND IN THE INPUT TEST VAL
                   1UE RANGE.  RETURNING TO MAIN LINE'/)
ISN 0083       1000 RETURN
ISN 0084            END
```

NAME	TAG	TYPE	ADD.	NAME	TAG	TYPE	ADD.	NAME	TAG	TYPE	ADD.	NAME	TAG	TYPE	ADD.
B	SF	R*8	0001F0	G	SF	R*8	0001F8	I	SF	I*4	0001C0	K	F	I*4	0001C4
N	SF	I*4	0001C8	X	SFA	R*8	000200	Y	SFA	R*8	000208	AA	SF	R*8	000210
BB	SF	R*8	000218	CC	SF	R*8	000220	EI	SF	R*8	000228	IR	S	I*4	0001CC
M3	F	I*4	0001D0	NC	S	I*4	0001D4	N2	SF	I*4	0001D8	RK	S	R*8	000230
R1	SF	R*8	000238	R2	SF	R*8	000240	X1	SF	R*8	000248	C21	SFA	R*8	000250
C23	S	R*8	000258	IND	SF	I*4	0001DC	NCY	C	I*4	N.R.	Y22	SF	R*8	000260
CHK1	S	R*8	000268	COEF	F C	R*8	002B20	INDS	S	I*4	0001E0	IND2	SF	I*4	0001E4
NCOM	F C	I*4	0079E0	NSOL	SF	I*4	0001E8	SCOM	C	R*8	N.R.	TEST	C	R*8	N.R.
PSTRS	S C	R*8	004560	DSQRT	XF	R*8	000000	FDXPD#	XF	R*8	000000	IBCOM#	F XF	I*4	000000
STRESS	C	R*8	N.R.	TRYERR		R*8	000270								

***** COMMON INFORMATION *****

NAME OF COMMON BLOCK * * SIZE OF BLOCK 0080C0 HEXADECIMAL BYTES

VAR. NAME	TYPE	REL. ADDR.	VAR. NAME	TYPE	REL. ADDR.	VAR. NAME	TYPE	REL. ADDR.	VAR. NAME	TYPE	REL. ADDR.
STRESS	R*8	N.R.	SCOM	R*8	N.R.	COEF	R*8	002B20	PSTRS	R*8	004560
TEST	R*8	N.R.	NCOM	I*4	0079E0	NCY	I*4	N.R.			

LABEL	ADDR	LABEL	ADDR	LABEL	ADDR	LABEL	ADDR
18	0003F0	10	000408	500	000488	15	0004F8
70	000584	100	0005D8	476	000660	826	000746
150	000754	155	00077C	1000	0007E8		

OPTIONS IN EFFECT NAME= MAIN,OPT=00,LINECNT=59,SIZE=0000K,

OPTIONS IN EFFECT SOURCE,EBCDIC,NOLIST,NODECK,LOAD,MAP,NOEDIT,ID,NOXREF

STATISTICS SOURCE STATEMENTS = 83 ,PROGRAM SIZE = 2114

STATISTICS NO DIAGNOSTICS GENERATED

****** END OF COMPILATION ****** 29K BYTES OF CORE NOT USED

STATISTICS NO DIAGNOSTICS THIS STEP

II-C

```
IEF142I - STEP WAS EXECUTED - COND CODE 0000
IEF285I   SYS77283.T120647.SVC00.MEN2#BFA.RC000224      SYSOUT
IEF285I   VOL SER NOS= SPCL31.
IEF285I   SYS77283.T120647.SVC00.MEN2#BFA.LOADSET       PASSED
IEF285I   VOL SER NOS= DSKC06.
IEF285I   SYS77283.T123456.I0007.MEN2#BFA.SC000086      SYSIN
IEF285I   VOL SER NOS= SPCL02.
IEF285I   SYS77283.T123456.I0007.MEN2#BFA.SC000086      DELETED
IEF285I   VOL SER NOS= SPCL02.
IEF373I STEP /C       / START 77283.1406
IEF374I STEP /C       / STOP  77283.1408 CPU   0MIN 04.35SEC MAIN 168K LCS   0K
 WAIT 0000MIN 16.20SEC   SYSIN 00022REC   UNUSED CORE 002K   EXCPS 000062   SYSHRS   .002036
 354 000032X;331 000012X;235 000018X
XXL       EXEC PGM=IEWL,PARM='&LMAP,LET,LIST,&OVLY',                    00000140
IEF653I SUBSTITUTION JCL - PGM=IEWL,PARM='MAP,LET,LIST,',
XX              COND=(4,LT,C),REGION=100K,TIME=&LTIME                   00000150
IEF653I SUBSTITUTION JCL - COND=(4,LT,C),REGION=100K,TIME=5
XXSYSLIN    DD DSNAME=&LOAD,DISP=(OLD,DELETE)                           00000160
IEF653I SUBSTITUTION JCL - DSNAME=&&LOADSET,DISP=(OLD,DELETE)
XX          DD DDNAME=SYSIN                                             00000170
XXSYSUT1    DD SPACE=(3072,(30,10)),UNIT=DKSCRA                         00000180
XXSYSLIB    DD DSNAME=SYS1.FORTLIB,DISP=SHR                             00000190
XX          DD DSNAME=SYS1.FORTRAN,DISP=SHR                             00000200
XXSYSPRINT  DD SYSOUT=A,SPACE=(TRK,(3,10))                              00000210
XXSYSLMOD   DD DSNAME=&GOSET&MEMR,DISP=&DISP,UNIT=&UNIT,SPACE=&SPACE    00000220
IEF653I SUBSTITUTION JCL - DSNAME=&&GOSET(MAIN),DISP=(NEW,PASS),UNIT=DKSCRA,SPACE=(3072,(30,10,1),RLSE)
IEF236I ALLOC. FOR MEN2#BFA L
IEF237I 331   ALLOCATED TO SYSLIN
IEF237I 230   ALLOCATED TO SYSUT1
IEF237I 137   ALLOCATED TO SYSLIB
IEF237I 137   ALLOCATED TO
IEF237I 354   ALLOCATED TO SYSPRINT
IEF237I 231   ALLOCATED TO SYSLMOD
```

D12

LTR 144 38

```
F88-LEVEL LINKAGE EDITOR OPTIONS SPECIFIED MAP,LET,LIST
        DEFAULT OPTION(S) USED -  SIZE=(92160,8192)
```

MODULE MAP

CONTROL SECTION NAME	ORIGIN	LENGTH	ENTRY NAME	LOCATION	NAME	LOCATION	NAME	LOCATION	NAME	LOCATION
MAIN	00	1CD8								
TRYERR	1CD8	842								
IHCLSQRT*	2520	158								
			DSQRT	2520						
ECHC *	2680	50C								
IHCECOMH*	2B90	F41								
			IBCOM#	2B90	FDIOCS#	2C4C	INTSWTCH	3AB6		
IHCCOMH2*	3AD8	65C								
			SECDASD	3E50						
IHCFCVTH*	4138	119C								
			ADCON#	4138	FCVAOUTP	41E2	FCVLOUTP	4272	FCVZOUTP	43C2
			FCVIOUTP	4770	FCVEOUTP	4C72	FCVCOUTP	4E8C	INT6SWCH	5173
IHCEFNTH*	52D8	512								
			ARITH#	52D8	ADJSWTCH	5644				
IHCEFIOS*	57F0	1378								
			FIOCS#	57F0	FIOCSBEP	57F6				
IHCUOPT *	6B68	320								
IHCERRM *	6E88	58C								
			ERRMON	6E88	IHCERRE	6EA0				
IHCUATBL*	7448	638								
IHCETRCH*	7A80	28E								
			IHCTRCH	7A80	ERRTRA	7A88				
IHCFDXPD*	7D10	1A0								
			FDXPD#	7D10						
IHCLEXP *	7EB0	288								
			DEXP	7EB0						
IHCLLOG *	8138	200								
			DLOG10	8138	DLOG	8150				
$BLANKCOM	8338	80C0								

```
ENTRY ADDRESS       00
TOTAL LENGTH     103F8 =     66,552(10)

****MAIN      DOES NOT EXIST BUT HAS BEEN ADDED TO DATA SET
```

0-13

LTR 1144 38

```
IEF142I - STEP WAS EXECUTED - COND CODE 0000
IEF285I   SYS77283.T120647.RV000.MEN2#BFA.LOADSET      DELETED
IEF285I   VOL SER NOS= DSK006.
IEF285I   SYS77283.T120647.RV000.MEN2#BFA.R0000225     DELETED
IEF285I   VOL SER NOS= DSK002.
IEF285I   SYS1.FORTLIB                                 KEPT
IEF285I   VOL SER NOS= DSKIPL.
IEF285I   SYS1.FORTRAN                                 KEPT
IEF285I   VOL SER NOS= DSKIPL.
IEF285I   SYS77283.T120647.SV000.MEN2#BFA.R0000226     SYSOUT
IEF285I   VOL SER NOS= SPOL31.
IEF285I   SYS77283.T120647.RV000.MEN2#BFA.GOSET        PASSED
IEF285I   VOL SER NOS= DSK005.
IEF373I STEP /L        / START 77283.1408
IEF374I STEP /L        / STOP  77283.1408 CPU    0MIN 01.22SEC MAIN  98K LCS   0K
 WAIT 0000MIN 13.75SEC   SYSIN 00000REC   UNUSED CORE 602K   EXCPS 000166   SYSHRS   .001069
 331 000013X;000 000000X;230 000032X;137 000044X;137 000000X;354 000043X;231 000034X
XXX       EXEC PGM=*.L.SYSLMOD,COND=((4,LT,C),(4,LT,L)),                  00000230
XX              REGION=&XREG,TIME=&XTIME                                  00000240
IEF653I SUBSTITUTION JCL - REGION=200K,TIME=2
XXFT05F001  DD DDNAME=SYSIN                                               00000250
XXFT06F001  DD SYSOUT=A,DCB=(RECFM=FBA,LRECL=133,BLKSIZE=1596),           00000260
XX             SPACE=(7980,(&XPGS,16),RLSE)                               00000270
IEF653I SUBSTITUTION JCL - SPACE=(7980,(299,16),RLSE)
XXPLOT      DD &PLOT,SPACE=(TRK,(&TP1,&TP2)),UNIT=DKSPOL                  00000280
IEF653I SUBSTITUTION JCL - DUMMY,SPACE=(TRK,(20,20)),UNIT=DKSPOL
//X.SYSIN           DD DSN=SYS77283.T123456.I0007.MEN2#BFA.S0000091,
// VOL=SER=(SPOL03),DISP=(OLD,DELETE),UNIT=DKSPOL
//
IEF236I ALLOC. FOR MEN2#BFA X
IEF237I 231   ALLOCATED TO PGM=*.DD
IEF237I 136   ALLOCATED TO FT05F001
IEF237I 236   ALLOCATED TO FT06F001
```

APPENDIX E

MICROFICHE LISTINGS AND OUTPUT