Design of a partially Parallel Stump Jump Mechanism

using

Computer -Aided Design

by

B.B.S Lutchmeea

Thesis Submitted for the degree

of

Master of Applied Science

in

The University of Adelaide

Australia

(Faculty of Agricultural and Natural Resource Science)

May 1997

TABLE OF CONTENTS

Table of Figures

List of Tables

Acknowledgements

I gratefully acknowledge the assistance, guidance and encouragement of my supervisors Hugh Reimers and Paul Harris of the Faculty of Agricultural and Natural Resource Sciences, The University of Adelaide and Dr. Kazeem Abharry and Dr. John Fielke from the School of Manufacturing and Mechanical Engineering, The Levels Campus, University of South Australia. The completion of this research would not have been possible without their guidance and assistance in particular Dr. Kazem Abhary who was actively involved in the design part of the project.

I would also like to thank Dr. J. M. Desbiolles and Andrew Burge from the Agricultural and Machinery Research and Design Center,School of Manufacturing and Mechanical Engineering, The Levels, University of South Australia for their help, advice and friendship.

Special thanks are due to Professor David Coventry, Head of the Department and David Matthew, Acting Departmental Manager for providing administrative and financial support. It was my pleasure to be with them during my stay.

Finally my deep appreciation goes to my father who provided me with moral support and encouragement throughout the period of study

Declaration

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being available for loan and photocopying.

Signed Date 25/5/92

B.B.S. Lutchmeea

Abstract

Change in tillage practice over the past decade has been greatly influenced by two factors namely the need to reduce energy consumption in tillage operations and the retention of crop residue as a soil conservation measure. These changing cultural practices have greatly influenced tillage tool design. One response to these changes involves the design of a partially-parallel stump mechanism to cope with the new conditions. In this research computer aided design is used to improve the design of a partially parallel stump jump mechanism which was initially developed by Riley. The principal aim is to reduce the existing link dimensions of the mechanism so that it can be suitable for use on small tractors.

To achieve the above aim, kinematic analysis was performed by using the LINCAGES-4 computer software package for sizing of the links. The mechanism was designed for chisel ploughing for fluctuating load with average horizontal and vertical soil forces of 2.5 kN and 1.0 kN respectively. Force analysis was carried out using the MICRO-MECH software package for calculation of joint forces. For the stress calculation impact and fatigue phenomena were taken into consideration and a separate computer-aided finite element analysis was performed on individual links of the mechanism. The result obtained from the kinematic analysis shows that there was an improvement in the dimensions of the links. The driver link has been reduced from 600 mm to 363 mm, the coupler link from 400 mm to 303 mm and the follower link from 400 mm to 306 mm.

INTRODUCTION

Major objectives of tillage in farming are to produce a suitable soil environment for germination and growth of plants and to control weeds. These can be achieved by loosening the soil thus killing weeds and also reducing compaction which causes poor aeration and reduction in moisture infiltration.

The most common tillage method involves the use of implements that are drawn either by animals or tractors. The former is used in many developing countries where agricultural mechanisation is less common whereas the latter is almost universal in developed countries.

The main problem farmers encounter during tillage operations is breakage or premature fatigue failure of an implement due to impact loads. Impact loads (shock loads) can occur even when an implement is working in seemingly uniform soil conditions. The presence of obstructions in the soil, such as stones and roots can cause large shock loads many times greater than the mean value of soil resistance. Hence, the main focus of tillage implement designers is to optimise the design of the implements so that they are cost effective, use less draft force, are more ruggedly built and have the ground tools protected by some form of impact reducing devices.

Kilgour and Reece (1962), identified four basic principles which can be used to minimise impact loads:-

(a)Reduce the weight of the tractor and the implement and decrease the stiffness of the implement and its connection to the tractor.

(b)Reduce that part of the impact load that is contributed by traction during impact

(c)Provide some energy absorbing capacity in the system so that only a portion of the kinetic energy is turned into strain energy.

(d)Provide "impact avoiding " devices whereby the tillage tool is able to ride over obstructions. These devices include some energy storing capacity so that the tool can be driven back into its working position.

However to attain the above objectives is not an easy task, since there are many variables which influence the design requirements. With the rapid acceleration of computer technology, Computer Aided Design (CAD) has become a very popular tool for the designers of tillage implements, as it can cater for many variables and solve the problem of complex calculations.

In this project CAD is used to design an impact avoiding device known as a partially parallel stump-jump mechanism which is mounted on individual soil working tools of an implement, as developed by Riley and Fielke (1990). The following procedure is followed for the design of the mechanism:-

(a) Kinematic synthesis and analysis

(b) Kinetic analysis

(c) Structural design for strength and fatigue

The LINCAGES-4 software computer package is used for synthesis of the mechanism and kinetic analysis is performed using the MICRO-MECH software package to calculate the joint forces. The stresses are calculated by a finite element analysis package (ANSYS) using the boundary conditions obtained from MICRO-MECH and finally the mechanism is designed for strength and fatigue.

Aims and objectives

The main aim of the project is to optimise (reduce cost and weight) the design of the existing stump-jump mechanism of Riley and Fielke (1990) so that it can be used on small tractors which are common in the fields of developing countries.

Chapter1

1. LITERATURE REVIEW

1.1 Stump-jump mechanism

The purpose of a stump-jump mechanism is to enable tillage implements to pass over obstacles such as stones or stumps and then return to their working position without stopping or suffering breakages. Stump-jump mechanisms may employ gravity, spring or hydraulic arrangements to hold the tine rigidly against their stops whilst draft forces are less than a certain pre-set magnitude. When the draft force is increased the tine is displaced in a rearward and upward direction relative to the implement frame, enabling the tillage point to pass safely over an obstacle and return to its original position.

1.2 Historical background

The stump-jump mechanism was first developed by Smith of Kalkabury in South Australia in 1876. It was commercially known as Smith's "vixen" plough and used gravity-restored linkages on a three furrow mouldboard plough (Quick (1982)). The need for this arrangement arose in Australia because farmland was recently opened up for cropping and imported machinery was unsuitable. The new land was often previously covered with (eucalyptus) forest or scrub, and there was a shallow sheet of limestone rock leading to breakage of imported machines and damage to horses and equipment.

Quick (1982), found that the next stage in the development of stump-jump systems, which followed within a decade, was the "bridle-draft" design. Draft was transmitted to each tine by an equaliser mechanism so that each tine could move independently if an obstruction was encountered. Due to problems with underframe clearance and rapid wear of pins and linkages, bridle-draft design was superseded by a spring loaded mechanism which spread rapidly in Australia after 1900; most recently hydraulic systems have been employed to provide the restoring force.

1.3 Current stump-jump mechanism

The current stump-jump mechanisms available on the market are classified into four groups.

1.3.1 Coil type stump-jump

The coil type is the simplest form of tine protection device which relies on shank deflection to relieve overloading. The shank is usually made of square section spring steel with two large spring coils adjacent to the mounting point. This type does not exhibit a breakaway point as both the horizontal displacement and the vertical displacement are directly related to the tine draft force. During use a coil type will displace or` hangback` until the force generated by the shank and the coil deflection equals the tine draft requirements. This type has little application in operations requiring accurate control of working depth but is used for secondary cultivation equipment.

1.3.2 Cushion spring type.

There are two types of cushion springs.

1.3.2.1 Forward-mounted cushion spring

The forward-mounted cushion spring type (see Fig 1-1) consists of one or two compression springs mounted vertically in front of the tine pivot point. The tine does not exhibit a definite breakaway point and jump height is restricted. This type has fairly high draft requirements and hangs back under heavy load, thus giving poor weed control. In addition this type produces poor working tine characteristics and it can be bent or damaged if used in heavy soils with obstacles present, such as stumps and rocks.

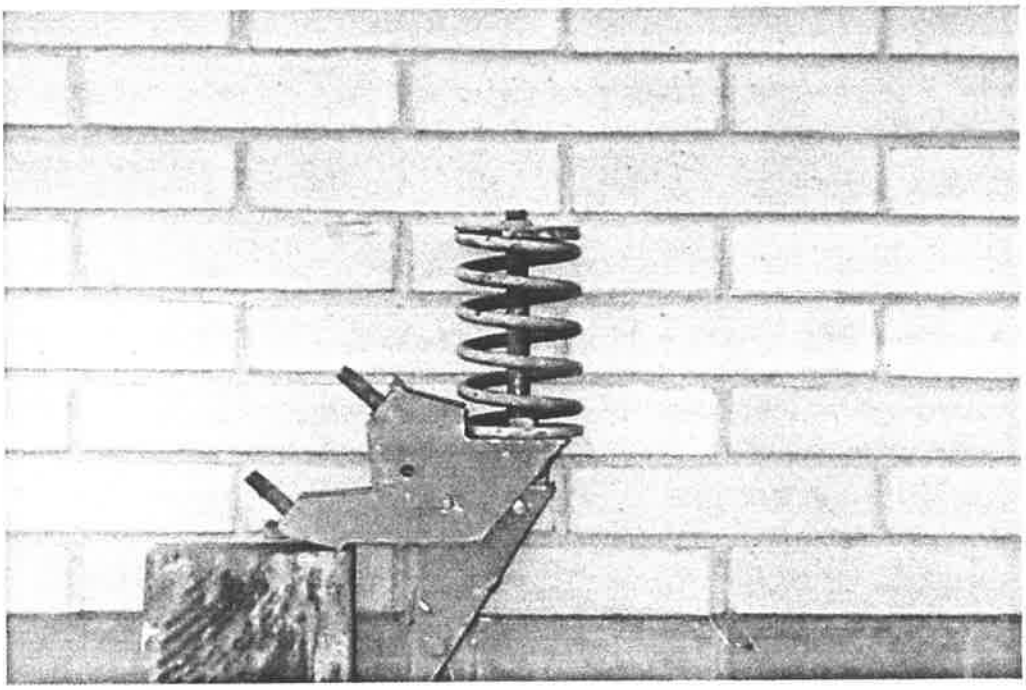


Figure 1-1 Forward mounted cushion spring

1.3.2.2 Rear-mounted cushion spring

The rear-mounted cushion spring mechanism, Figure 1-2 is similar to the forward-mounted type except the springs are mounted at the back of the tine pivot point. Because of the geometry, this type of mechanism produces a good tine characteristic, the tine exhibits a definite breakaway point which is adjustable by varying the spring pretension. The draft force required increases at a constant rate as the share is displaced vertically. The draft force continues to increase once the share is clear of the ground until maximum jump height is reached. Because of the constant increase of force with vertical displacement, the tine components are subjected to large forces and hence the components are heavily constructed. The mechanism is simply constructed and contains two pivot points.

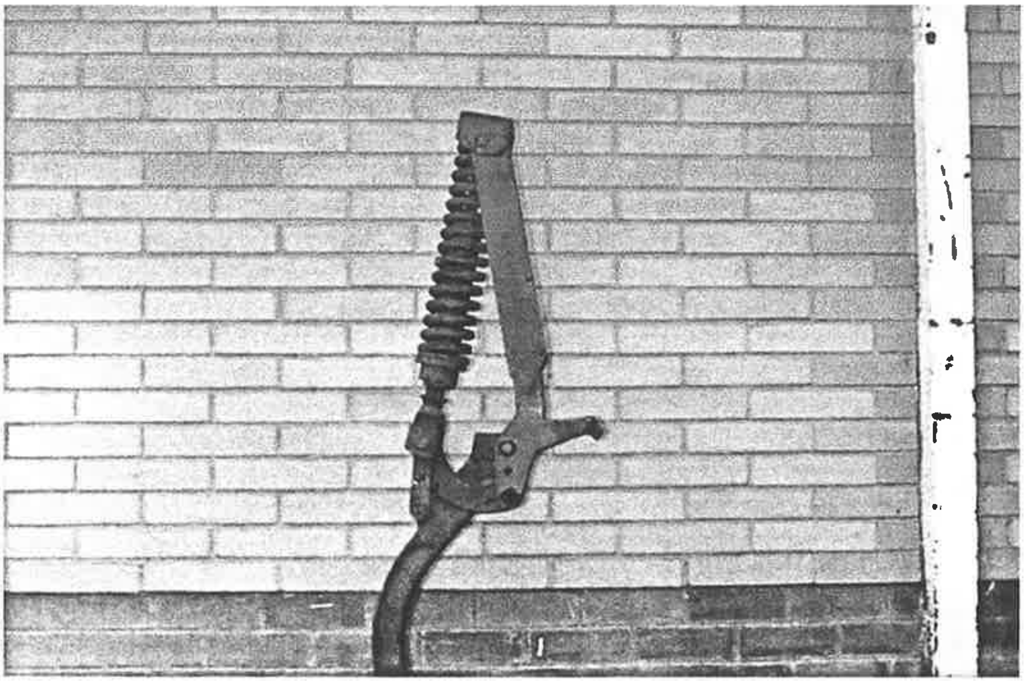


Figure 1-2 Rear mounted cushion spring

1.3.3 Lock toggle type

This type of mechanism utilises two additional linkages whose geometry varies as the force generated by the spring is applied. The lock toggle mechanism is more complex and generally consist of five or more pivots points but offers the best potential in terms of an ideal tine characteristic, in that it can be designed so that the returning moment is reduced as the mechanism retracts to higher positions. The large number components and the number of pivots required make the system expensive and prone to wear if subjected to excessive stump-jump cycling.

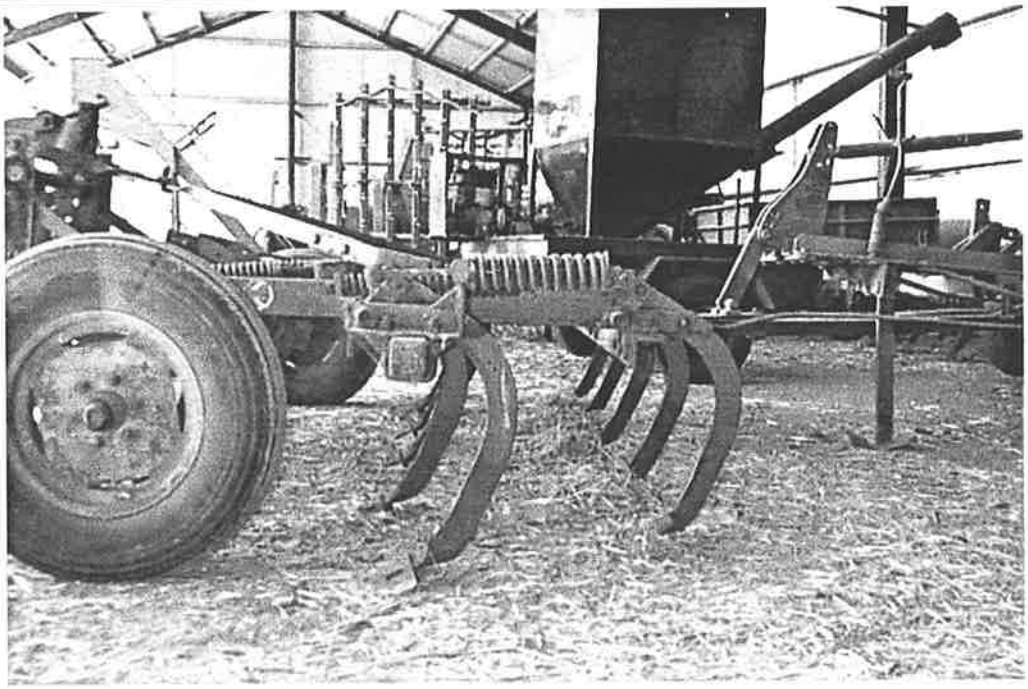


Figure 1-3 Lock toggle

1.3.4 Hydraulic type

The hydraulic type (see Figure 2-4) utilises an hydraulic cylinder instead of a spring to hold and protect the tine when it is working. Various forms of accumulators are used to adjust the tine breakout pressure and its re-entry to the working position. The tine has a definite breakout force, and by varying the geometry, a good tine characteristic can be produced. Moreover by changing the pressure in the hydraulic tine system, the breakout pressure of the tine can be varied during working. Hence, it has an added advantage as compared to the other types of mechanism. This type is the most expensive protection system, but is reliable under heavy and rough working conditions and has the highest draft requirements.

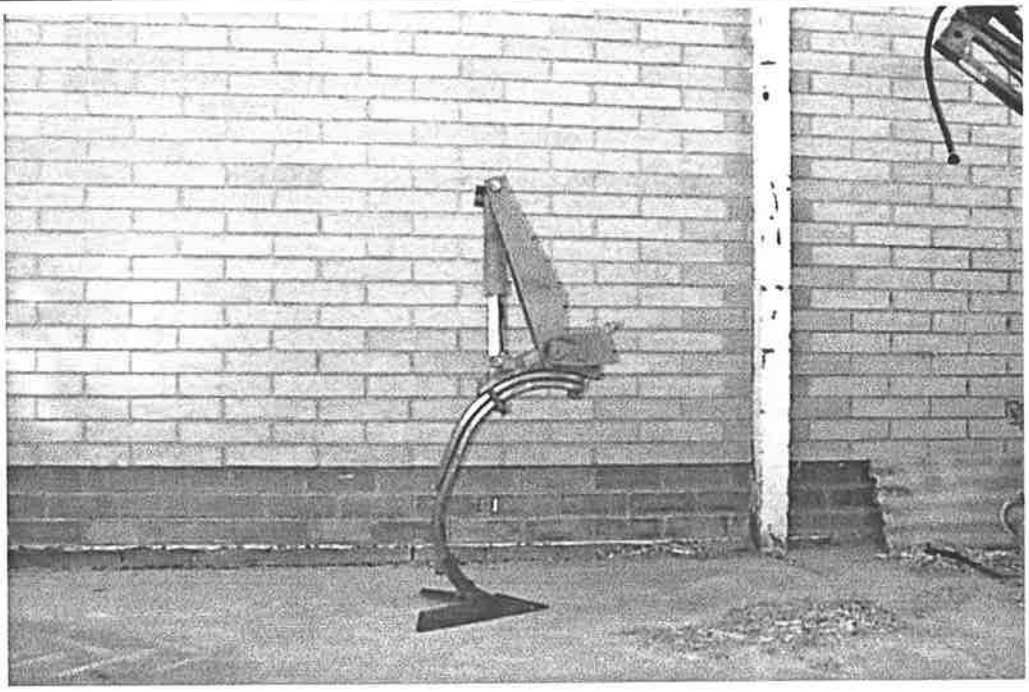


Figure 1-4 Hydraulic type

1.4 Past research on stump-jump mechanism

Past research on stump-jump mechanisms is limited. Bowditch and Willis(1965) experimented with simple lever and spring arrangements and their conclusion was that there is an advantage in a mechanism yielding a constant draft force relative to both horizontal and vertical displacement of the tillage point. Constant draft mechanisms have an advantage over other mechanisms since a much smaller increase in strain energy is developed when passing over an obstacle, inferring that less energy is available to cause damage on re-entry into the ground. The amount of pre-load required on conventional mechanisms is critical. Frictional effects in stump-jump mechanisms are undesirable because they imply wear at the pivot points.

Blair (1969) developed a mathematical model for the force characteristics of a toggle action and a direct action stump-jump linkage for a disc plough. Solution of the analysis was calculated with the aid of a digital computer. These computer programs used by plough designers to study the effects of changes in the linkage design. Although the model does not directly simulate the behaviour of the linkage in field conditions, the computed result can act as a guide for the designer.

Quick (1982) also developed a computer program which can simulate the performance characteristics of stump-jumps and undertake a sensitivity analysis of a specific stump-jump mechanism in order to optimise the design and fulfil predetermined force-jump requirements, improve working life of components, or minimise cost of the design. Details such as pivot friction, spring buckling, energy storage systems, effects of vertical force components, and dynamic characteristics were not taken into consideration in order to simplify the model. Dependable and reproducible results were obtained and there was reasonable conformity between theory and practice.

In a subsequent work (Quick et al (1984)) the effect of pivot friction was incorporated into the model and laboratory tests were performed to show the effect of different degrees of pivot friction and to identify energy absorption in the system components. Three cases of pivot friction were considered (as supplied, increased friction and lubricated) and curves of horizontal force v/s vertical jump height were plotted for each case. The curves showed that the effect of artificially increased pivot friction and reduced pivot friction was not pronounced but it was evident from the plotted curves that by reducing the pivot friction, change in the characteristic of the curve was observed..

Robotham et al (1983), made an engineering comparison of all the available commercial mechanisms. Their report is very useful for selection of a particular type of commercial stump-jump mechanism as all the characteristics (share angle, force and displacement) of a stump-jump can be found and one can determine the best characteristics of a stump-jump.

MacMillan et al, (1986) also developed laboratory facilities to study the characteristics of stump-jump mechanisms. Unlike past researchers who only used horizontal loading acting on the tine for characteristic analysis, they used tangential effects as well as horizontal loading as separate forces acting on the tine. Their findings showed that the horizontal and tangential methods are similar when the tine is in its working position and hence give a similar release force but they become progressively different as the tine retracted.

In all the above mentioned works the stump-jump mechanism was analysed from static loading condition. Riley et al (1986) however, reported the dynamic testing of a hydraulically loaded and spring loaded stump-jump mechanism. The mechanisms tested were on John Shearer's™ Trashworker' ™ chisel plough and Econodraft's™ chisel plough. The main objectives were to measure the variation in hydraulic pressure at the ram, the force on the spring and the strain in the tine during the extension and return strokes of a jump cycle. They also studied the breakaway force at commercial ploughing speed and the merits of hydraulic and spring loaded stump-jump mechanisms. Their conclusions for a hydraulically loaded trashworker mechanism were that the dynamic breakaway force at commercial ploughing speeds may be more than three times the static hydraulic force. There is an increase in breakaway force with increased speed. The return force and velocity is low and there is negligible tine vibration on the return to stop. On the other hand for a spring loaded mechanism, the breakaway force remains constant at different speeds. On the return stroke, the velocity is very high (estimated 110 Km/h) and there is extreme tine vibration and hence high impact stresses are developed in the tine.

Most of the commercially available stump-jump mechanisms rely on a tine pivoting about a single point. As a result of the single point, the set angle of the share changes as the mechanism operates, even for a small jump which is very common during tillage activities. Hence there is nose rubbing of the tillage points, decrease of the share cutting efficiency, increase in the draft force and consequently more energy is required to pull the implement through the soil. But Riley and Fielke (1990), of the University of South Australia developed a new type of mechanism known as partially parallel stump-jump mechanism in order to achieve the optimum performance of a stump-jump mechanism. The mechanism consists of four pivot pins to keep the tillage tool at its correct operating angle in the soil, while it can still pivot in a conventional manner. The benefits that the partially parallel stump-jump mechanism offers as compared to the conventional one are:

- the set angle remains unaltered for operating depth of up to 100 mm;
- reduced share nose-rub,
- improved trash handling,
- improved soil cutting efficiency,
- minimal soil disturbance and
- contour following ability.

The main disadvantage of the partially parallel stump-mechanism is that it contains more pivot points (four) as compared to the conventional stump-jump implying that more maintenance costs are involved due to wear of the pivot points, more pivot friction and the weight of the mechanism is too large for use on small tractors.

1.5 Forces acting on the stump-jump mechanism

Apart from soil resistance (draft, vertical and sideways forces) which acts on the stump-jump mechanism, one of the important group of forces which need to be considered in the design of a stump-jump mechanism are the impact forces. Impact forces are important because they are the major loads that act on a tractor-drawn implement. These forces not only determine the design of the implement from the point of view of strength but in practice cause many breakages, particularly on tillage implements.

Clyde (1949), pointed out that for an impact in which the implement is not damaged, the kinetic energy of the tractor and the implement is transformed into strain energy of the implement and the hitch, this transformation being complete at the moment when the tractor is brought to rest and the impact force reaches its maximum. While this process is going on the tractor continues to move, so that kinetic energy is added to traction energy from the wheels and potential energy if on a gradient, and some energy is lost in overcoming rolling resistance.

Hanavan and Reece (1961), developed a theoretical analysis of impact forces between a tractor-drawn implement and a rigid body obstruction for an idealised case. It was assumed that before impact the tractor is not developing any traction and during impact any tractive effort developed by the tractor wheels only counteracts the rolling resistance of the tractor. The maximum impact force is found to be proportional to the tractor velocity and the square root of both the tractor weight and the tractor/implement stiffness. Furthermore they reported a simple method for measuring the stiffness of the tractor to implement connection..

Studman (1975), studied the impact loads produced when a cutting surface contacted objects of known mass buried in a sandy loam soil at three depths,130, 160 and 190 mm below the ground surface. One hundred and forty-four objects were buried in 12 rows 3 m apart and each object at 5m intervals along the row There were eight different types of object and each row contained four of these. His finding was that, during the interaction of the surface with the object at a working speed between 1.5 and 1.8 m s^{-1}, there were generally two peak loads in the load-time curve: the first lasting less than one millisecond was due to inertia, while the second, rising more slowly (referred to as penetration load), occurred as the object was pushed into the soil. Flints weighing 2.4 kg frequently produced impact loads in excess of 8 kN, and in one case a load of 18 kN was recorded.

Small flints weighing only 0.3 kg caused up to 7 kN impact loads. Penetration forces up to 12 kN were observed with bricks weighing 2.3 kg. It was concluded that the magnitude of the impact peak depended upon the mechanical properties of the object, while the penetration force depended on the shape of the object.

Yu and Wills (1987), recommended that if implements are to be properly designed and load limiting devices incorporated, where appropriate, it is important that the physical parameters concerned with impact are understood. They developed a simple impact model to give an accurate description of impact on the assumption that there is no soil resistance opposing the motion of the obstacle. Their conclusions were as follows:

- The impact loading was dependent on various physical, geometrical, and operational parameters of the tractor and the implement combination,
- The maximum impact force is linearly dependent on the forward tractor speed,
- Impact loads depend upon the stiffness of the tractor and implement combination,

- The geometry of the tractor and implement combination greatly influences the load transfer during impact and it is more prominent as the obstacle and tractor weight increases and
- Implement combination and the weight of the obstacle have a significant effect on impact load.

1.6 Computer Aided Design (CAD)

Application of CAD is well advanced in most branches of engineering, however in Agricultural Engineering (particularly in the area of tillage) its application has been quite limited. The main reason appears to be due the fact that the design of a tillage implement involves a complex soil/tool interaction and it is very difficult to accurately access the design parameters. Moreover, tillage implement designers were less concerned about weight in the past. But now with modern techniques available to access the design parameters of tillage implement and due to the greater emphasis on the adverse effect of weight (compaction, energy consumption etc), tillage implement designers are attempting to optimise their designs in order to reduce the weight and cost.

Mc Kay et al.(1984), highlighted some of the advantages that CAD offers to agricultural machinery designers, for example:

- Rapid solution of complex problems;
- The ability to design using simulation techniques;
- The capacity to find optimum solutions;

- Availability of sensitivity analysis;
- The potential for rapid re-design of new and existing components and better insight into problems.

The author concluded that CAD is an extremely valuable, and not necessarily expensive design tool which offers the only method of enabling designers to keep pace with new problems, products, production methods and competition Hence Computer-Aided Design will play an increasingly important role in the design philosophy of tillage implements.

1.6.1 Kinematic synthesis/analysis of mechanism

In the past, kinematic synthesis of mechanisms has relied on the trial and error method. It was based on a combination of intuition, experience, graphical construction, and thumb-tack and cardboard prototype generation. The theory of kinematic synthesis exists for a systematic mathematical approach but it is tedious and involved. By using the trial and error method, potential linkages solutions were achieved but it was cumbersome and time consuming and it did not provide the designer with reasonable tools to choose the optimum one within the allocated time. This situation has led to instances where wrong choice of mechanism has been made (eg.a cam mechanism has been favoured instead of a linkage type mechanisms). With the development of computer technology, the mathematical approach has become more readily available as computers can make these calculations faster and transparent by using interactive graphics. Some of the commercially available synthesis software packages which use interactive graphics are; CADOM ™, MICRO-KINSYN ™, MECSYN ™, LINKCAGES ™ and GISK ™. All of these are meant for 2 dimensional planer linkages and use the Burmester theory for their solution with the exception of CADOM ™ and GISC ™ which use polynomial and Wilson methods for their solution respectively.

Kinematic synthesis consists of type synthesis and dimensional synthesis. Type synthesis is the process of deciding which type of mechanism to synthesise, the solution can be a four-bar mechanism, a geared linkage or a cam mechanism. Depending upon the applications task (function, path, motion or rigid body guidance), one can decide which type of mechanisms is best suited. Normally, simplicity and experience is the best guide for selecting which type of mechanism to synthesise.

Dimensional synthesis on the other hand concerns choosing the best dimensions which satisfy the prescribed motions and constraints.

Kinematic analysis involves the study of the geometry of motion (displacement, velocity and acceleration) without regard to the forces involved in the motion.

After the chosen type and dimensions are decided, kinetic analysis is performed to calculate the reactions, member forces and moments acting on each component Finally the structural members are designed for strength, durability and reliability.

1.6.2 Computer-Aided design of spring loaded mechanism

An extensive literature search shows that few researchers have worked on computer-aided design for spring loaded mechanisms applicable to tillage implements.. Some of the relevant works are summarised below.

As reported by Kaufman (1978), John Deere and Company designed a new spring-reset plow for operation in rocky soil with the help of the Dynamic Response Articulated Machinery (DRAM ™) software package. First, the mechanism was designed to perform the required trip-reset function . Then its operation was analysed and refined with DRAM ™ package. The computer simulation was in good agreement with the field testing and an animation of the computer simulated behaviour is presented.

Chace (1978), from the Department of Mechanical Engineering University of Michigan also used the DRAM ™ package for computer simulation of plough trip and re-setting.

Dandu et al. (1991), reported the use of CAD to synthesise the optimal performance of a spring-loaded four-bar mechanism used for a farm seeding and fertilising machine incorporating a sequential quadratic programming technique. Maximum lift and magnitude of actuation force were significantly improved over a current design. In-field performance of the mechanism when encountering an obstacle was verified using a dynamic model to realistically simulate the event.

1.6.3 Rigid body motion/Finite element analysis

Huang and Wiley (1985), developed three approaches for combining a rigid body dynamic simulation package (DRAM ™) and a finite element package (ANSYS ™) for the elastodynamic analysis of a slider-crank mechanism with a rigid crank and a flexible connecting rod. This was a quasistatic analysis, where DRAM was used to obtain rigid-body inertia forces and ANSYS was employed for a series of linear static analysis for these rigid inertia forces and external forces at various positions. The approaches discussed are, uncoupled, stiffness coupled and totally coupled.

The uncoupled approach consists of two separate analyses. A rigid body analysis is performed first followed by a finite element analysis. The rigid body analysis is conducted over the entire simulation time and solutions which include position, velocities, accelerations (linear and angular), joint forces and other external forces are output at each integration step.

A static finite element analysis is then performed on the individual flexible components of the system at each output step of the rigid body analysis. The forces applied to the finite element analysis consists of both inertial forces and joint forces.

The stiffness coupled approach interfaces rigid body analysis and finite element analysis at each integration step. Rigid body analysis is used to predict the system displacement at each time step. With the predicted solutions, a static finite element analysis for each of the flexible components of the system is performed and the deformed geometry of the system including the joint locations and the centre of mass associated with the flexible components is updated accordingly. With the modifications due to elastic deformation, the system configuration is recalculated with the rigid body analysis. This interface between the two analyses at a time step iterates until the correction is smaller than a specified tolerance. The solution process continues until the end simulation time is reached.

The totally coupled approach simultaneously solves for all the system variables, which include both the rigid body motion and the elastic deformation.

McConville and Steigerwald (1985), also analysed a slider-crank mechanism with a rigid crank and a flexible connecting rod by a combined approach involving a rigid body dynamics package and a finite element package, but they used ADAMS for the rigid body analysis along with ANSYS. They employed a quasistatic approach similar to that of Huang and Wiley (1985).

Claar and Chmielewski (1991), presented alternative approaches for modelling linkages with several Computer Aided Engineering (CAE) simulation packages. Discussion was based in terms of the unique design features and capabilities that each CAE software package offered. The CAE software packages discussed were ANSYS, a finite element analysis (FEA) program, integrated mechanisms program (IMP), which is a multibody system analysis program together with its companion program (geometric modelling of solids), Quattro a spreadsheet analysis program, and a special user-written analysis/animation program. All the above mentioned programs were used to demonstrate the modelling procedures of a dump trailer lift mechanism.

Bidhendi et al.(1990), reported the use of the finite element method (FEM) to describe the dynamic behaviour of a chisel plough tine. They determined that the use of the natural frequencies of the chisel plough tine assembly to induce desirable frequencies and mode shapes helped reduce energy consumption.

Chi and Kushwaha (1991), reported on the application of a non-linear three-dimensional, finite element model to study soil- tool interaction. The model catered for both the effect of soil strength and soil-metal friction and the interface element between the soil and the tool surface was based on an hyperbolic model. Tests were conducted in a soil bin to verify the model and it was shown that the finite element analysis predicted draft force for a simple tillage tool with 0.8% to 10.5% error.

In all the above mentioned work, the three-dimensional shape representation of the body can be drawn either by constructive solid geometry in which an object is represented by combinations of basic shapes(cubes, spheres, wedges etc) or by boundary representation which defines the spatial region of the body by its boundary surfaces. Doi and Miyake (1993), have come up with a new technique for geometric modelling which uses the principle of video camera images from multi-directional projection to construct the solid model. This information is very important (even though not used in this project) because in a tillage blade, its three-dimensional shape has great influence on tillage efficiency and blade wear.

1.7 Desirable features of a stump-jump mechanism

The main requirement of a stump-jump mechanism is to hold down the ground tool in its working position under normal circumstances, yet prevent damage and cope with obstacles without the need to stop the implement. Moreover with increased tractor power, further demands have been placed on the design of the stump-jump, these include:

(i) Greater breakout load setting, to enable implements to operate at higher operating speed with correspondingly higher draft forces (Quick, 1982) ;

(ii) The need for greater underframe clearance to enable the implement to pass through heavy crop residues (Mac Kay and Hill, 1980) ;

(iii) The share to maintain a particular pitch angle with respect to the soil over as much of the jump range as feasible (Quick1982) and,

(iv) Minimum energy storage in the system, to reduce wear on individual components and the risk of damage to the machine frame (Sineokov,1965) as cited by Quick (1982). The partially-parallel stump-jump mechanism fulfils the above mentioned requirements to a certain extent.

1.8 Factors affecting the design of stump- jump mechanism

The design of a stump-jump mechanism involves a complex analysis of soil/tool interaction and for this reason stump-jump design requirements may vary according to a particular tillage practice or soil type. However, in general, all stump-jump mechanisms require certain characteristics to function properly.

1.8.1 Desirable characteristics of stump-jump mechanisms

1.8.1.1 Avoid excess storage of energy

It is desirable to avoid excess storage of energy in the mechanism. During a stump-jump cycle a spring stores energy as the tine retracts and releases this energy as the tine returns to its normal working position. The amount of energy that is desirable is only the minimum amount which is required for effective re-entry and return of the tine when passing over an obstacle. Excessive storage of energy is undesirable because it requires large springs and possible damage to the mechanism upon sudden release of the stored energy.

1.8.1.2 Setting of pre-load

The restraining force generated by the stump-jump mechanism should always exceed that of the average draft force of the ground tool at any point in the cycle by an amount of 25% as reported by some researchers.

1.8.1.3 Re-entry of tine into soil

After the ground tool has cleared the soil surface, the force generated by the mechanism should reduce to a level that will allow the ground tool to easily clear the obstruction without damage to the tool or the machine frame. However ,sufficient force must be maintained to ensure re-entry of the groundtool into the soil.

Chapter 2

2. Kinematic Design of the mechanism

2.1 Introduction

The aim of kinematic design is to select suitable dimensions of the four-bar linkages of the stump-jump mechanism such that, the existing kinematic specifications of the stump-jump mechanism are retained. The existing mechanism is shown in Figure 2-1

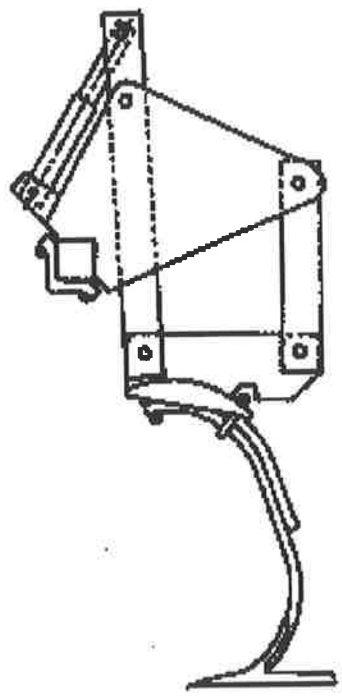


Figure 2-1 Existing stump-jump mechanism

To achieve the above aim, the LINCAGES-4 ™ computer software package is used to analyse the four-bar linkage of the mechanism.(LINCAGES stands for Linkage INteractive Computer Analysis and Graphically Enhanced Synthesis and was developed by Professor Arthur G. Erdman from the Institute of Technology, University of Minnesota, Minneapolis -USA). Its analysis capabilities are animation and kinematic analysis of four-bar linkages. The synthesis capabilities are motion, path and function generation of four-bar linkages using four precision points. It uses the principle of Burmester theory (Sandor and Erdman) for its solution and it is available for I.B.M PC and Macintosh hardware.

The existing dimensions and kinematic of the four-bar linkages are shown in Figure 2.2 to Fig 2. 4 and Table 2.1

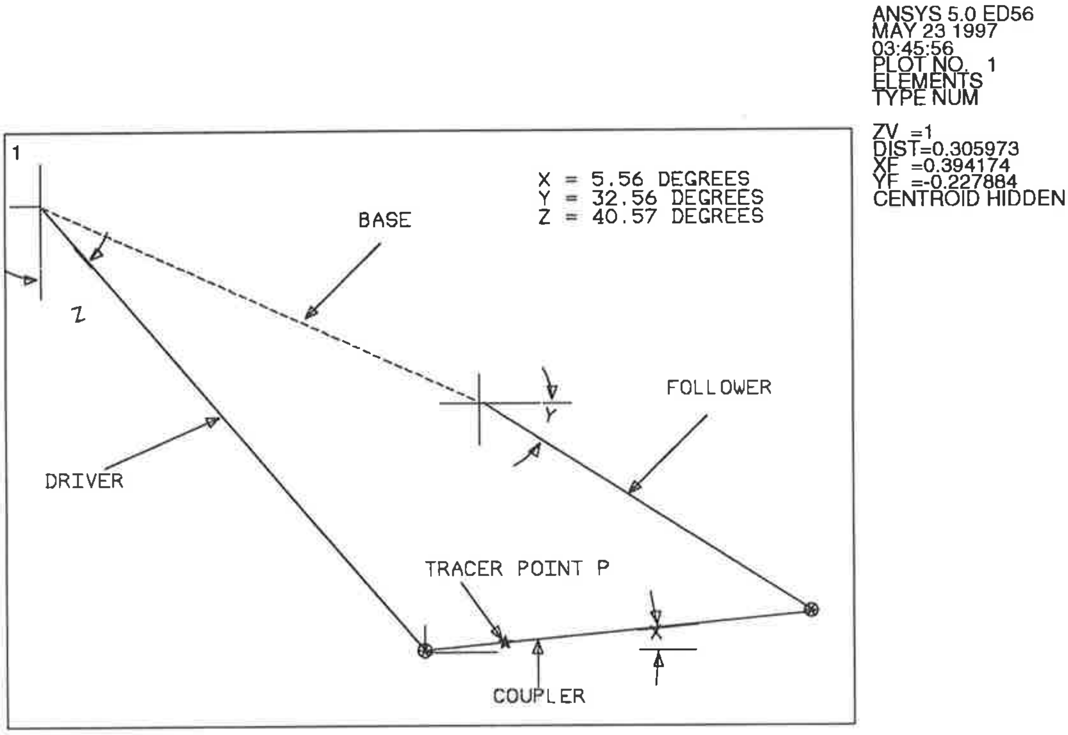


Figure 2-2 Position of existing four bar linkage

Table 2-1 Dimension of the existing four bar linkage

Member	Dimension (mm.)
Driver	600
Coupler	400
Follower	400
Base	495

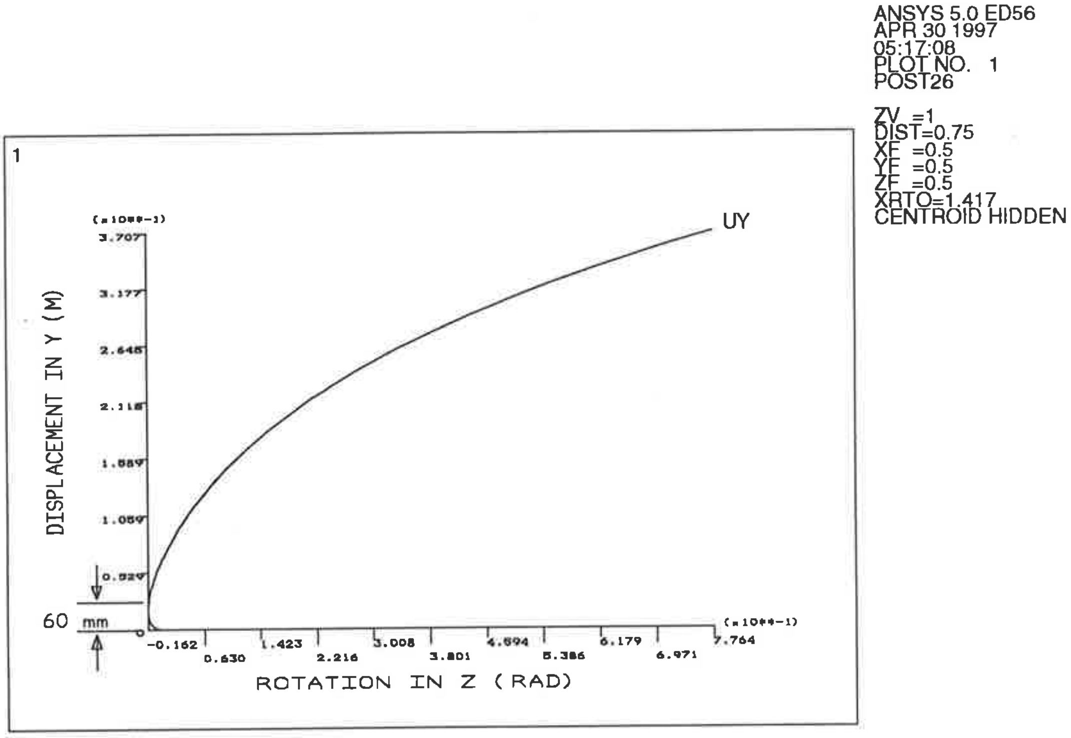


Figure 2-3 Vertical Displacement v/s Rotation of the tracer point P

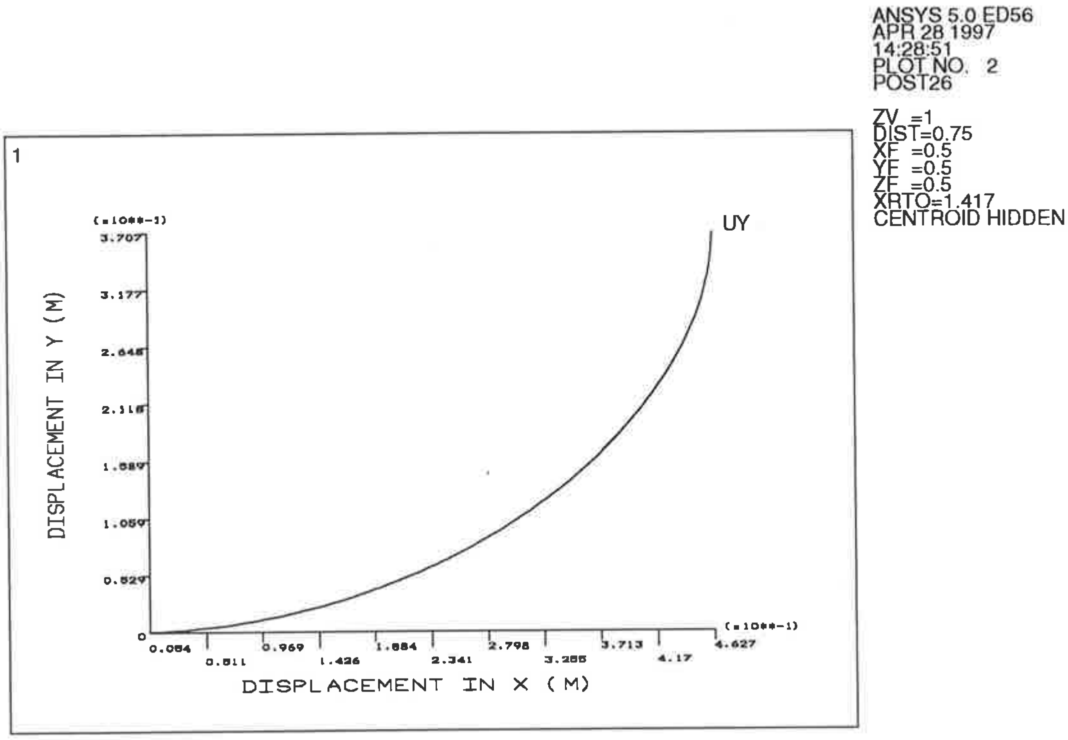


Figure 2-4 Vertical Displacement v/s Horizontal Displacement of the tracer point P

2.2 Desirable kinematic specifications of the mechanism

The desirable kinematic specifications of the stump-jump mechanism are as follows:-

(a) Within the working depth range, i.e. approximately 0-100 mm, the set angle of the tool should remain almost constant so as to get a more or less consistent tillage depth under varying soil forces cause minimal soil disturbance and exhibit contour following ability.

(b) In retraction, i.e. from a height of 100 mm to about 300 mm, the set angle of the tool may be altered to a sharp angle to minimise the chances of becoming caught by obstacles on the soil surface.

(c) The horizontal displacement should be as amplified as possible to avoid rapid acceleration and hence large magnitude of inertia forces in the mechanism.

(d) The dimensions of the mechanism are obtained by reducing those of the existing one as much as possible.

Having the above mentioned constraints, it is may not be possible to design a mechanism which satisfies all these requirements. However, a mechanism which can approximate the above requirements would suffice.

2.3 Kinematic Design of the mechanism

2.3.1 The approach via the computer package

For the kinematic design of the mechanism, different geometries of the four-bar linkage were investigated using the pivot specifications option of the LINCAGES-4 computer software package. The pivot specifications method consists of specifying the coordinates of the following:

- Driver ground (fixed) pivot
- Follower ground(fixed) pivot
- The driver joint
- The follower joint and
- A tracer point(which can be located on any link of the mechanism so that the locus of the tracer point can be plotted when the mechanism move).

The output from LINCAGES-4 are the angular orientation of the driver, coupler, and the follower; the vertical and horizontal displacement of the tracer point and the velocity and acceleration of the coupler and the follower based on a unit acceleration of the driver for the possible range of motion of the mechanism.

The approach used for the kinematic design of the mechanism is to choose a suitable dimension of the four bar linkage in which the coupler link satisfies the desirable kinematic specification as explained in section 2.2. In doing so, if at a later stage, a tine is attached to any point on the coupler link, the kinematics of the tine will be the same as the coupler link. Hence the main criterion for the kinematic design of the partially parallel stump-jump mechanism depends upon the dimension of the four bar linkage and the position of the ground pivot points.

2.3.2 Procedure for kinematic design

The first step of the design consists of specifying the pivot coordinates and a tracer point on the coupler link for particular dimensions and orientation of a four bar linkage. The analysis result was then observed for possible changes in the pivot coordinates in order to obtain a four bar linkage in which the angular rotation of the coupler for a vertical displacement of 100 mm remains almost constant, along with a relatively large horizontal displacement and afterwards the angle should change sharply. The next step of the design consists of specifying different pivot coordinates by trial and error until a suitable one is achieved. Finally a feasible range of motion of the mechanism is decided so that the mechanism can be engineered without any difficulty for manufacture.

2.4 Results

The most promising dimensions obtained for the four-bar linkage by LINCAGES-4 package are shown in Table 2-2. Figure 2-5 shows the positions of the mechanism, which can be engineered for manufacture and Table 2-3 shows the angular position of the driver, coupler, follower and the vertical/horizontal displacement of the tracer point P2 (figure 2--4) for the entire possible range of motion of the four bar linkage. A first approximation of an actual mechanism was drawn from the theory developed above and is included in the appendices (Appendix 1(a) shows the detail of the joint and tine whilst appendix 1(b) shows the changes in the relative positions of the components of the joint as it strikes an obstruction.).

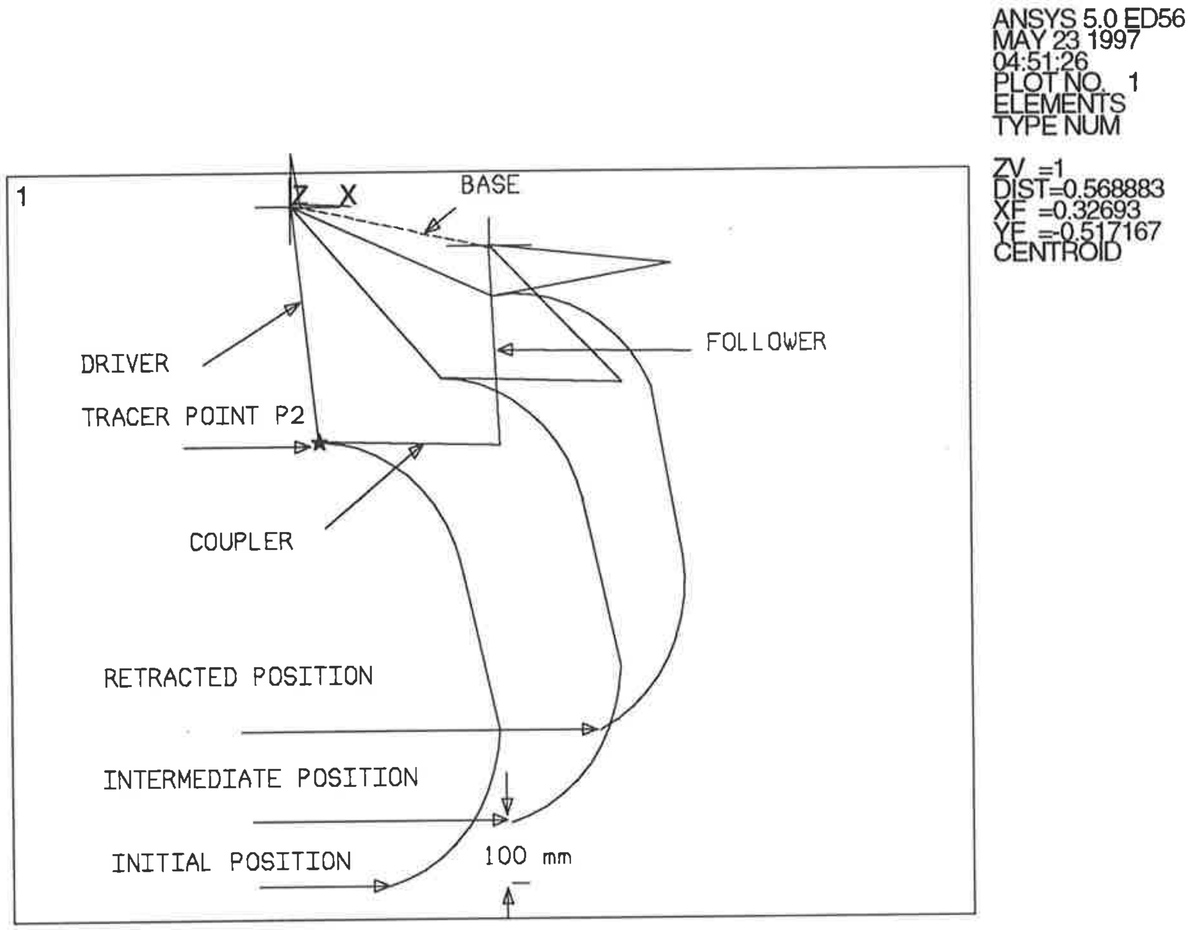


Figure 2-5A Position of the mechanism

Table 2-2 Dimension of the four bar linkage

Member	Dimension(mm.)
Driver	363
Coupler	303
Follower	306
Base	335

Table 2-3 Kinematics of the four-bar linkage

Angular Orientation			Tracer point	
Driver	**Coupler**	**Follower**	**X**	**Y**
Deg	Deg	Deg	mm	mm
228.1	20.0	200.1-	-148.5	-235.91
31.1	11.6	211.6	-129.85	-262.47
234.2	8.9	217.5	-113.72	278.84
237.2	7.0	222.5	-97.39	-292.87
240.2	5.6	227.1	-80.69	-305.29
243.3	4.5	231.4	-63.58	-16.35
246.3	3.6	235.6	-46.07	-326.35
249.3	2.8	239.6	-28.19	-334.81
252.4	2.1	243.5	-9.97	-342.31
255.4	1.5	247.3	8.53	-348.69
258.4	1	251.1	27.28	-353.96
261.5	0.5	254.8	46.22	-358.13
264.5	0.1	258.5	65.31	-361.2
267.6	359.7	262.1	84.49	-363.18
270.6	359.4	265.7	103.71	-364.06
271.3	359.3	266.6	108.23	-364.11
273.6	359.1	269.3	122.91	-363.86
276.7	358.8	272.9	142.05	-362.59
279.7	358.6	276.5	161.08	-360.24
282.7	358.4	280	179.93	-356.84
285.8	358.3	283.6	198.55	-352.38
288.8	358.1	287.2	216.91	-346.9
291.8	358	290.7	234.93	-340.38
294.9	358	294.3	252.58	-332.87

297.9	358	297.9	269.8	-332.87
300.9	358	301.5	286.55	-324.36
304	358.1	305.1	302.78	-304.45
307	358.2	308.8	318.44	-293.07
310	358.4	312.5	333.49	-280.78
313.1	358.6	316.3	347.89	-267.57
316.1	359	320.2	361.59	-253.45
319.1	359.5	324.1	374.56	-238.41
322.2	0.1	328.2	386.75	-222.43
325.2	0.9	332.6	398.12	-205.46
328.3	2.1	337.1	408.62	-187.39
331.3	3.6	342.1	418.16	-168.04
334.3	5.9	347.7	426.62	-147.03
337.4	9.3	354.4	433.72	-123.68
340.4	14.6	2.9	438.71	-96.59
343.4	24	15.4	439.24	-62.81
346.5	42.4	36.1	426.8	-17.6
349.5	75.9	70.7	381.25	30.82
352.5	112.6	106.3	321.5	45.13
355.6	136.2	127.5	289.71	41.12
358.6	150.5	138.9	275.84	40.35
1.6	160.3	145.4	268.72	44.1
4.7	167.7	149.6	264.08	50.79
7.7	173.9	152.4	260.29	59.27
10.7	179.3	154.4	256.65	68.85
13.8	184.2	155.8	252.83	79.1
16.8	188.8	156.9	248.66	89.75
19.8	193.1	157.8	244.04	100.61
22.9	197.2	158.4	238.92	111.55
25.9	201.2	158.9	233.28	122.46

29	205.1	159.3	227.1	133.26
32	209	159.6	220.39	143.88
35	212.7	159.8	213.15	154.26
38.1	216.4	160	205.39	164.36
41.1	220.1	160.1	197.13	174.13
44.1	223.8	160.1	188.38	183.54
47.2	227.4	160.1	179.17	192.54
50.2	231	160.1	169.52	201.11
53.2	234.7	160	159.45	209.21
56.3	238.3	159.9	149.0	216.83
59.3	241.9	159.7	138.19	223.94
62.3	245.5	159.5	127.05	230.52
65.4	249.1	159.3	115.63	236.55
68.4	252.7	159.1	103.94	242.03
71.4	256.4	158.8	92.02	246.93
74.5	260.1	158.5	79.92	251.26
77.5	263.8	158.1	67.68	255
80.5	267.5	157.6	55.32	258.17
83.6	271.3	157.1	42.9	260.75
86.6	275.2	156.6	30.46	262.78
89.6	279.1	155.9	18.06	262.78
92.7	283.1	155.1	5.74	265.23
95.7	287.3	154.2	-6.43	265.23
98.8	291.7	153.1	-18.35	265.73
101.8	296.3	151.8	-29.91	265.83
104.8	301.3	150	-40.89	265.5
110.9	318.9	139	-54.16	273.34

2.5 Discussion and Conclusions

With the selected dimensions of the four bar linkage, the kinematic results show that the coupler angle remains almost constant when the driver angle is in the range of 276.7 to 313.1 degrees where the corresponding vertical and horizontal displacement are 100 mm and 205.84 mm respectively. Afterwards the coupler angle changes from -1.2 degree to 318.9 degrees, a rotation of 320.1 degrees, with a corresponding maximum vertical and horizontal displacements of 525.79 mm and 439.24 mm respectively.

In comparison with the existing dimension of the stump-jump mechanism, the kinematic result of the four bar linkage obtained from LINCAGES show that the coupler angle remains almost constant when the driver angle is in the range of 272.8 to 296.2 degrees where the corresponding vertical and horizontal displacement are 60 mm and 230 mm respectively. Afterwards the coupler angle can change from 0.8 degree to 287 degrees, with a corresponding maximum vertical and horizontal displacement of 1000 mm and 590 mm respectively.

If the four-bar linkage is constrained to move within the driver range of 81.9 degree with starting position of the driver being 276.7 degree, it is found that the coupler angle remains almost constant for a vertical displacement of 100 mm and afterwards it changes from -1.2 degree to 150.5 degree where the corresponding horizontal and vertical displacement are 133.79 mm and 402.9 mm.

Thus it is concluded that the selected dimension of the four-bar linkage with an initial angular position of driver being 276.7 degree approximates the desirable requirements of the mechanism(Figure 2.5 to 2.6) and is better compared to the existing one because

(i)the weight of the links are smaller than the existing one due to smaller dimension and identical material (Table 2.1 and Table 2.2)

(ii) less energy will be required to pull the mechanism, thus making it possible for use on small tractors which are very common in developing countries.

(iii) uniform tillage depth can be achieved within the operating depth of 100 mm because the coupler angle remains almost constant for a vertical displacement of 100 mm whereas in the existing one the coupler angle remains more or less constant for approximately 60 mm.

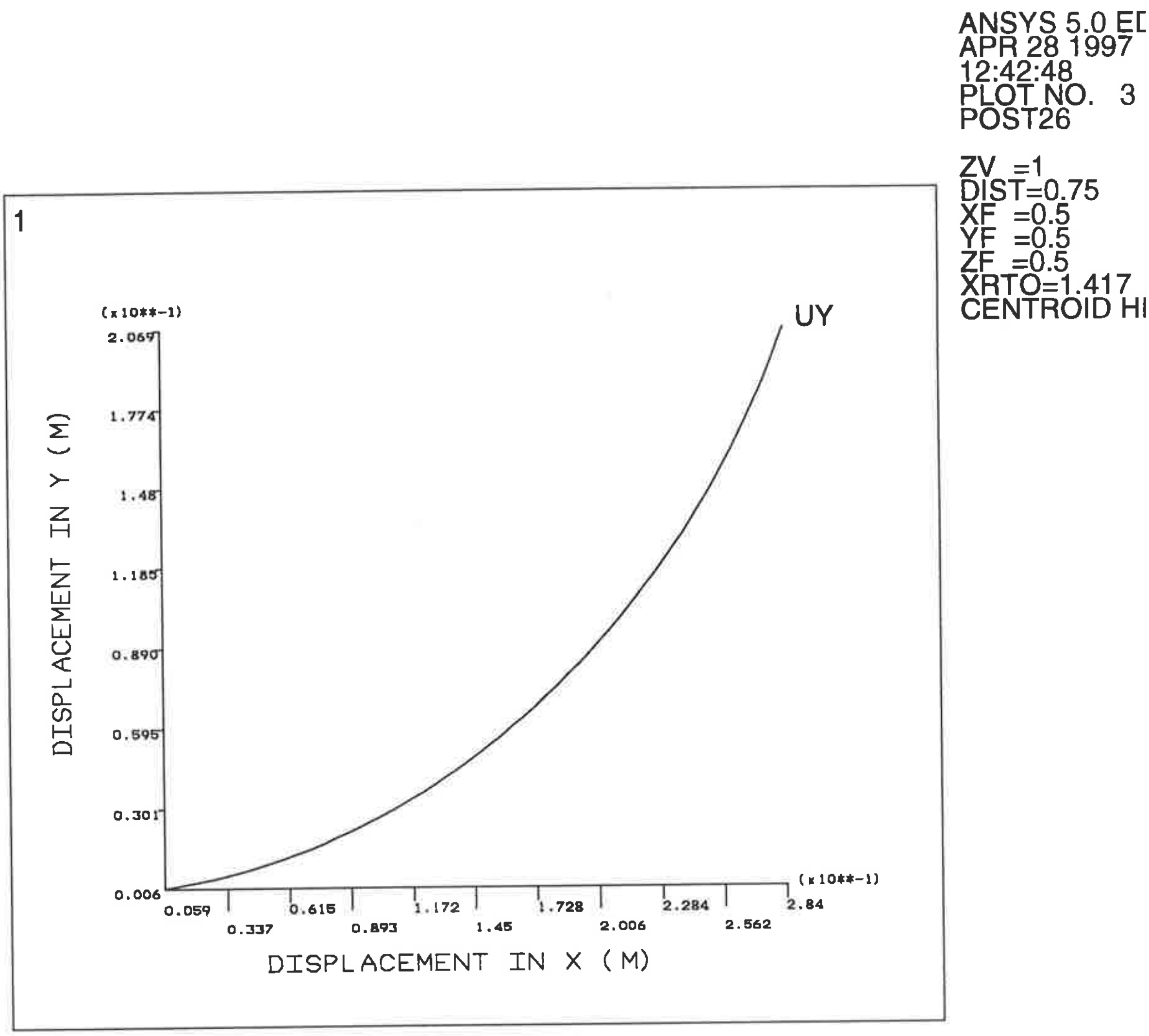


Figure 2-6 Displacement in Y v/s displacement in X of tracer point P2

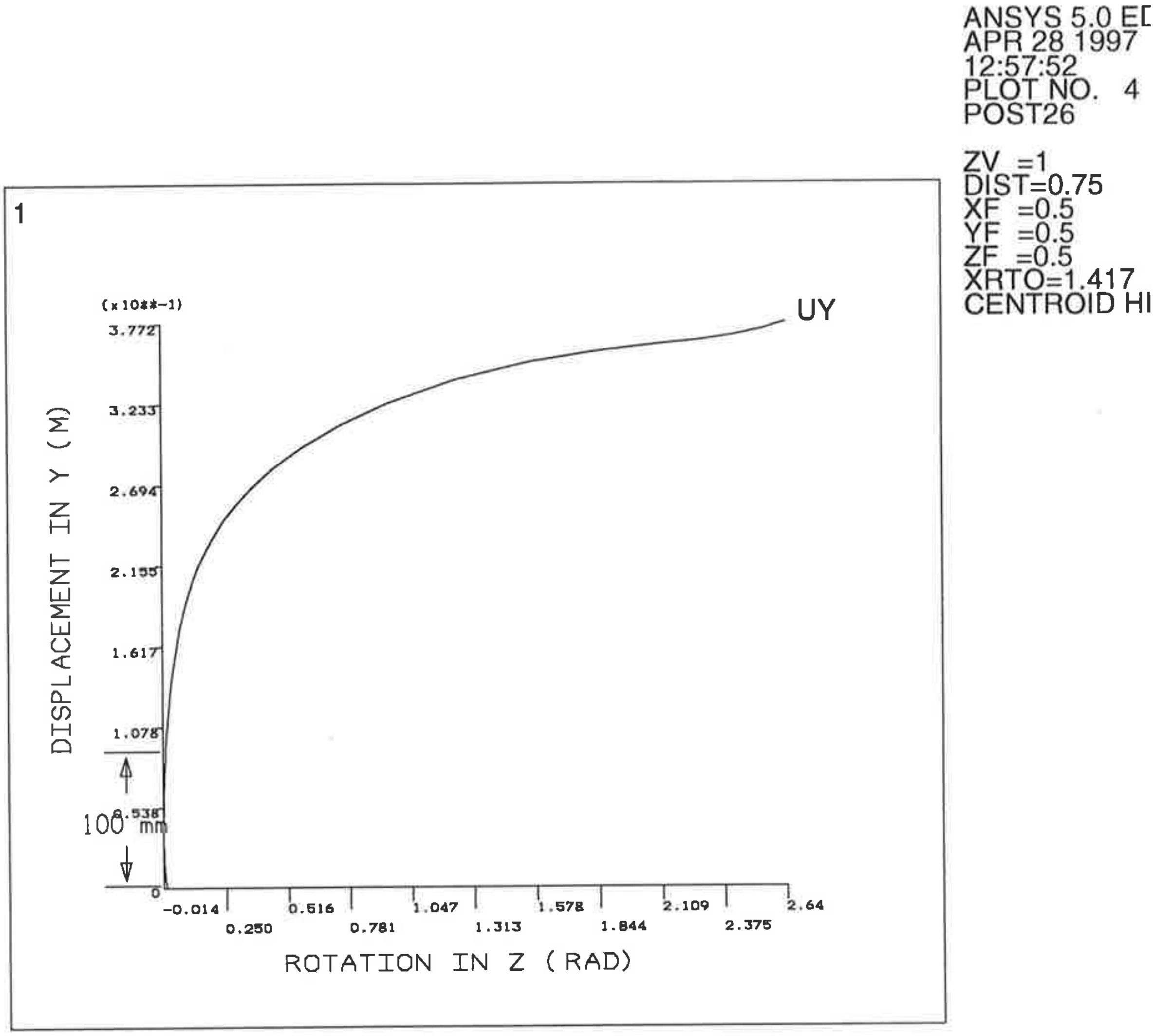


Figure 2-7 Displacement in Y v/s Rotation of the tracer point P2

Chapter 3

3. Kinetic Analysis of the mechanism

3.1 Introduction

The objective of kinetic analysis is to determine the joint forces of the mechanism subjected to known input soil forces to sustain the prescribed motion. Computer-aided Kinetic analysis of the mechanism is generally performed by rigid body motion analysis software package (ADAMS®, DRAM®, MICRO-MECH©) or by a general purpose finite element analysis packages (ANSYS™, ALGOR™, NISA™, NASTRAN™ etc). The rigid body analysis package is easily understood and simple whereas the finite element package is quite involved. As reported by Khaskia et al (1991), one way to approach rigid body analysis using a general purpose finite element software package is to simulate the stiffness with a relatively high value. This can be done by using an artificially high Young's modulus which will lead to high frequencies in the system response. The vibrations corresponding to high frequencies can be dampened by using structural and /or external damping.

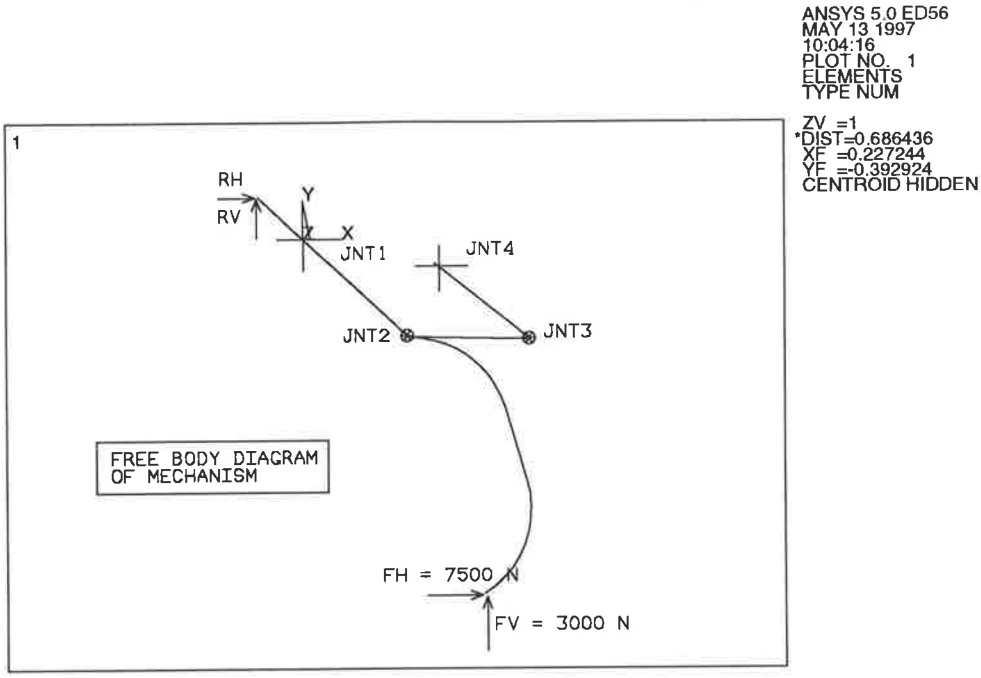
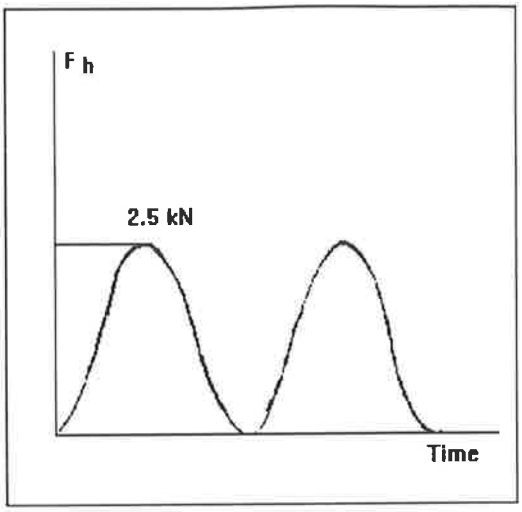


Figure 3-1 Free body diagram of the mechanism

In this project MICRO-MECH is used to calculate the joint forces acting on the mechanism. The main groups of forces that are taken into consideration for the calculation of joint forces of the mechanism are: the non uniform soil forces (horizontal/vertical) and impact force (shock) which generally occurs when the mechanism encounters an obstacle or stump. Since the soil forces acting on the mechanism are expected to vary quite often, it infers that the stresses will also vary accordingly. In other words the mechanism works under fatigue.

3.2 Assumptions made for force analysis of the mechanism

(i)the soil forces acting on the tine of the mechanism are assumed to be an average force of 2.5 kN acting horizontally, Figure 3-2 (a) ,and an average force of 1.0 kN acting vertically, Figure 3-2 (b), for an operating depth of 100mm



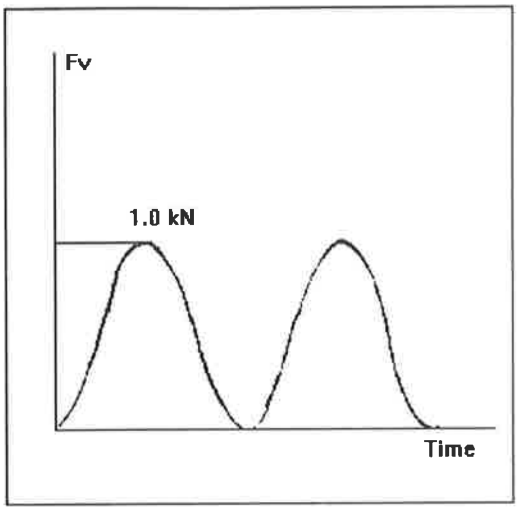


Figure 3-2a **Figure 3-2b**

(ii)for fatigue analysis, the worst possible case is taken into consideration; i.e. the forces acting on the mechanism are assumed to be three times the average horizontal/vertical soil forces (impact forces) and the force is of repeated nature, that is to say once the tine reaches the operating depth i.e 100 mm, it encounters an obstacle and it retracts back and enters the soil once more, encounters another obstacle, retracts back and this cycle continues (Figure 3-3)

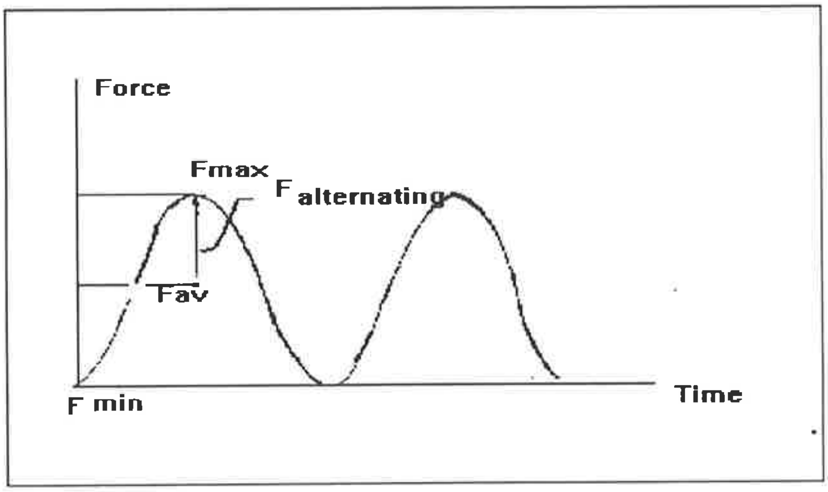


Figure 3-3

(iii) the time taken by the mechanism to enter the soil starting from 0-100mm is estimated as 50 millisecond based on Riley work (1986).

(iv) for dynamic analysis, the mechanism is analysed only for the last portion of the forward stroke i.e when the tine starts entering the soil until it reaches the operating depth. This part of the motion is very critical because the tine is subjected to very high impact and alternating forces and hence breakage of tine will occur during this part of the motion. If it is safe in this portion of the motion it will be safe during the whole operation.

(v)the driver links of the mechanism moves with a linear angular velocity and therefore constant acceleration throughout the whole motion. The angular velocity and acceleration of the driver link are taken as -13.96 rad s^{-1} and -558.5 rad s^{-2} respectively, calculated as follows:-

change in angle of the driver link of the mechanism during the motion of the tine into the soil is 40 ° (Table 2-3) and the time taken is 0.05 seconds. Then assuming linear angular velocity

$$\omega = At + B$$

where at $t = t_1$ (when the tine starts entering the soil) $\omega = -\omega_1$ (maximum) and at $t = t_2$ (when the tine reaches the operating depth 100 mm) $\omega = -\omega_2 = 0$ (clockwise angular velocity is considered negative) Therefore

$$A = \omega_1/(t_2-t_1) = w_1/\Delta t$$

$$B = -w_1 t_2/\Delta t$$

$$\omega = \omega_1/\Delta t\ (t-t)$$

$$\omega_{av} = -\omega_1/2$$

where ω_{av} can be estimated as

ω_{av} = change in angle(rad) /time = $-\Delta\theta/\Delta t$ = - 2πx 40/360x0.5 =-0.6981317/.05 = -13.963 rad /s

$\alpha = -\Delta\omega/\Delta t = -(\omega_2 - \omega_1)/\Delta t = -(0 + 2\omega_{ave})/2 = -2 \times 13.963/.05 = -$ 558..51 rad s^{-2}

The angular velocity is negative because the mechanism decelerates during the operation

3.3 Force analysis of the mechanism.

A two dimensional dynamic force analysis using MICRO-MECH© was performed on the mechanism for an average horizontal soil force of 7.5 KN and an average vertical soil force of 3.0 KN (three times average soil forces Ref 3-2 (ii)) for the range of the motion when the tine starts entering the soil and reaches the operating depth of 100 mm.The time taken for the tine to reach the operating depth was 50 millisecond, the driver link was assumed to move with a constant angular velocity of -13.963 rad s^{-1} and constant angular acceleration of -558.51 rads^{-2} as estimated in section 3.2(vii).

3.3.1 General Description of MICRO-MECH

MICRO-MECH is a rigid body analysis software package developed by R.J Williams from Mint, Inc:, Minneapolis Minnesota and is available from Ham Software Company Ltd. It is used to analyse planar mechanisms consisting of rigid links connected by combinations of revolute and sliding joints. It can perform kinematic analysis, force analysis and dynamic analysis. The force analysis capability of MICRO-MECH© determines the driving forces and joint reaction forces required to produce a predefined motion where inertial forces of the links as well as many types of known forces if any, such as, spring forces, external forces and viscous damper forces applied to the links of the mechanism can also included in the force analysis. The dynamic time response analysis allows the prediction of the motion of a mechanism subjected to known forces and torques.

MICRO-MECH ©is used to analyse simple mechanisms, as well as, multiloop, multiple degree of freedom mechanisms. Mechanisms with open kinematic chains can also be analysed. The general architecture of the MICRO-MECH© is shown in Figure 3.1 and it consists of six modules as explained below

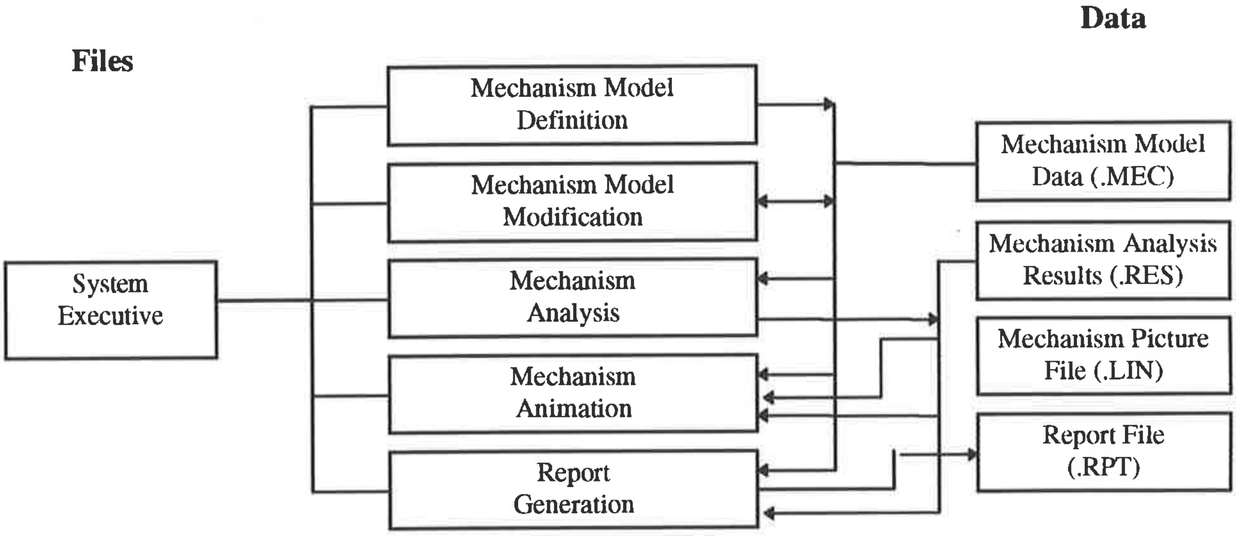


Figure 3-4 Architecture of MICRO-MECH (from MICRO-MECH Manual)

3.3.1.1 Executive module

The executive module controls the flow of the execution of the system between other modules and provides some auxiliary data file management functions.

3.3.1.2 Model definition module

The model definition module allows for the initial definition of a mechanism model.

3.3.1.3 Model modification module

The model modification capability includes changing parameters of the model, as would be required in a parametric design study.

3.3.1.4 Mechanism analysis module

The analysis module is the analytical heart of the system. Depending upon the definition of the problem i.e. the number of degrees of freedom, number of unknown forces and definition of the independent joint motion, MICRO-MECH can perform different types of analysis available within the system. The maximum number of forces which can be defined is equal to the number of degrees of freedom for the mechanism as calculated by the following equation:

DOF = 3*(nlinks-1)-2*(r+s)-sp

where:

nlinks = The number of links in the mechanism including the fixed link.

r = The number of revolute joints.

s = The number of slider joints

sp = The number of slider pin joints.

If the number of unknown forces acting on the mechanism is equal to the number of degrees of freedom, a kinematic analysis problem is defined (Micro-mech Manual) and kinematic and force analysis can be performed for the mechanism. On the other hand, if the number of unknown forces is less than the number of degrees of freedom, a dynamic time response analysis problem is defined (Micro-Mech Manual).

3.3.1.5 Mechanism animation module

The mechanism animation module provides the capability of graphically animating the mechanism. It includes simple vector diagrams or pictorial representation and path points located on the links during animation.

3.3.1.6 Report generation module

The report generation module provides the capability of obtaining plotted and tabular listings of the analysis results. The data reported in the tabular listings can be saved on a disk file and reviewed at a later time or can be passed to another program.

In addition to the above mentioned modules, MICRO-MECH generates four types of data files as follows:

- The mechanism model data file which is required to define the mechanism.
- The mechanism analysis result file containing the data generated by the mechanism analysis module.

- The mechanism picture file which is used to define a pictorial representation of the links of the mechanism, and finally
- A report file containing tabular listing generated by the report generation module.

3.4 INPUT DATA FOR FORCE ANALYSIS

The input data required by MICRO-MECH for force analysis consists of:

3.4.1 Definition of the kinematic topology

For the definition of the kinematic topology, each link is defined with respect to a reference link. First of all the ground link is defined, secondly the driver link is defined with respect to the ground link, thirdly the coupler link is defined with respect to the driver link and finally the follower link is defined with respect to the ground link.

3.4.2 Link length /dimensions

The link length of the mechanism was obtained by trial and error (Ref 2.4) from kinematic analysis and are recorded in Table 3-1.

Table 3-1Dimension of the links

Components	Unit (mm)
Base (Lo)	335
Driver (L1)	363
Coupler (L2)	303
Follower (L3)	306

3.4.3 Gravity vector

The gravity vector of the mechanism was defined as $-9.81 ms^{-2}$ acting in the y-direction.

3.4.4 Centre of gravity, Polar mass moment of inertia, weight of link

The centre of gravity, mass moment of inertia and weight of each link are calculated using the ANSYS™ Finite elements package. The centre of gravity of each link is calculated with respect to the system of coordinates established for the link and the polar mass moment of inertia is defined relative to the centre of gravity. The unit of weight for the link is Newton and for the mass moment inertia is $Nm.s^2$ (or Kg m^2), Table 3-2

Table 3-2

LINK	CENTRE OF GRAVITY		MASS MOMENT OF INERTIA	WEIGHT
	XC (m)	YC (m)	(Nm s^2	(N)
L1	0.1052496	0.0	0.5823915	172.25646
L2	0.16125	-0.17288	1.4282	249.21324
L3	0.1523825	0.0	0.1766289	113.1043

3.4.5 Definition of points.

Points are defined in the local coordinate system attached to the link of the mechanism for calculation of unknown forces, kinematic parameters of interest and application of known forces. The points are defined in Figure 3.5 and Table 3.3 where

P1 is the point of application of the hydraulic or spring,

p2 is the point of application of the soil forces,

p3 and p4 shows the direction of the horizontal soil forces,

p5 and p6 shows the direction of the spring or hydraulic,

p7 and p8 shows the direction of the vertical soil forces,

p9 is the centroid of the follower link,

p10 is the centroid of the driver link and

p11 is the centroid of the coupler link.

Table 3-3 Position of points on the mechanism

POINT	LOCATION	COORDINATES	
P1	L1	-0.155	0
P2	L2	0.138	-0.748
P3	L0	0	0
P4	L0	0.1	0
P5	L0	0	0
P6	L0	0.1	0.1061174
P7	L0	0	0
P8	L0	0	0.1
P9	L3	0.1523825	0
P10	L1	0.1052496	0
P11	L2	0.16125	-0.17288

3.4.6 Definition of the known forces

The known forces which act on the mechanism at the tip of the tine are assumed to be repeated as explained and illustrated in section 3.2, where the average horizontal soil force was taken to be 2.5 KN and the average vertical force 1.0 kN; and the direction of the horizontal force is defined by vector P3 P4 and the direction of direction of the vertical force is defined by vector P5 P6. The alternating soil forces are 7.5 KN acting horizontally and 3.0 KN acting vertically.These forces act at point P2, Figure 3-1.These average and alternating forces Fm and Fa respectively, are required to calculate the corresponding average and alternating stresses, σm and σa respectively induced in the mechanism, to be used in Soderberg criterion to estimate the factor of safety of the mechanism.

3.4.7 Definition of the unknown forces

Apart from the joints reaction forces, the unknown forces which need to be calculated are the inertia forces, inertia torque acting on each link of the mechanism and the reaction at the point where the spring will be connected. The spring or the hydraulic cylinder is connected at point P1 in the direction of vector P5.P6

3.4.8 Specification of the independent joint elements

The independent joint element is defined as a joint which forms part of the kinematic loop and it controls the motion of the mechanism (JNT1 in Figure 3-5) whereas the dependent joints are also part of the kinematic loop but whose position, velocity and acceleration are being determined by the geometric constraints of the loop (joints JNT2, JNT3 and JNT4 in Figure 3-5).

3.4.9 Solution control parameters

The solution control parameters determine the number of positions to be analysed as specified by the user, the time increment, the types of analysis to be performed and the tolerances for the solution.

In the present case, a force analysis is performed on the mechanism for nine positions of the driver link with a constant increment of 5 degrees, starting position at -43.3 degree and the final position at -83.3 degree, i.e. the starting and the digging position of the digging stroke.The time parameters and the tolerances are set to the default values.

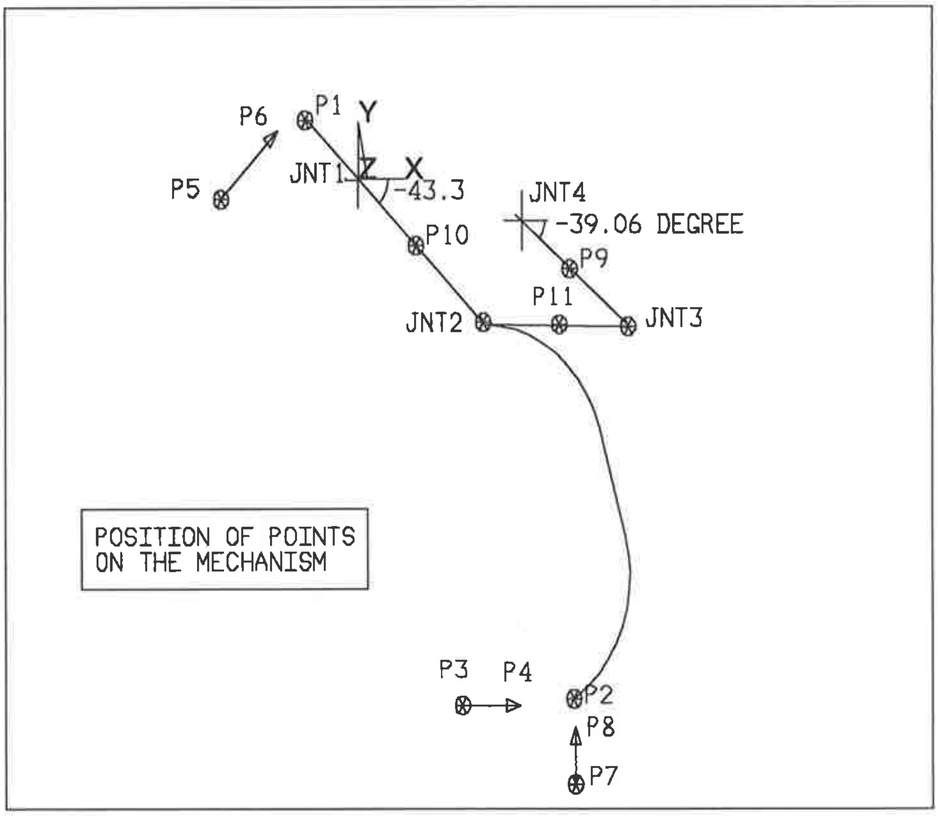


Figure 3-5 Position of points on the mechanism

3.5 Results of force analysis

3.5.1 FORCES AT JOINT J1

Table 3-4 Forces at Joint 1

POSITION OF JOINT J1 (θ) Degree	FX AT JOINT J1 Newton	FY AT JOINT J2 Newton	FORCES AT JOINT J1 Newton
-43.3	-70170.2	-10095.1	70892.6
-48.3	-63739.6	-8413.16	64292.4
-53.0	-58715.1	-7462.04	59187.3
-58.3	-54722.7	-6993.46	55167.8
-63.3	-51498.0	-6874.42	51954.8
-68.3	-48856.9	-7031.21	49360.3
-73.3	-46676.6	-7430.21	47264.3
-78.3	-44876.8	-8063.47	45595.4
-83.3	-43409.3	-8943.47	44321.0

3.5.1.1 FORCES AT JOINT J2

Table 3-5 Forces at Joint J2

POSITION OF JOINT J2 (θ) Degree	FX AT JOINT J2 Newton	FY AT JOINT J2 Newton	FORCES AT JOINT J2 Newton
-43.3	-42419.4	18655.7	46340.5
-48.3	-36951.8	19186.6	41636.0
-53.3	-32406.5	19504.9	37823.6
-58.3	-28548.0	19713.2	34692.9
-63.3	-25192.6	19859.4	32079.0
-68.3	-22203.4	19968.3	29861.8
-73.3	-19478.7	20051.7	27955.2
-78.3	-16940.8	20115.5	26298.8
-83.3	-14528.0	20162.5	24851.3

3.5.1.2 FORCES AT JOINT J3

Table 3-6 Forces at Joint J3

POSITION OF JOINT J1 (θ) Degree	FX AT JOINT J3 Newton	FY AT JOINT J3 Newton	FORCES AT JOINT J3 Newton
-43.3	30384.3	-23613.6	38481.3
-48.3	24651.3	-23796.1	34262.8
-53.3	19921.3	-23697.4	30958.4
-58.3	15940.1	-23449.9	28354.6
-63.3	12515.9	-23116.4	26287.2
-68.3	9508.3	-22729.8	24638.4
-73.3	6814.49	-22307.2	23324.9
-78.3	4356.89	-21857.8	22287.8
-83.3	2074.68	-21386.1	21486.5

3.5.1.3 FORCES AT JOINT J4

Table 3-7 Forces at Joint J4

POSITION OF JOINT J1(θ) Degree	FX AT JOINT J4 Newton	FY AT JOINT J4 Newton	FORCES AT JOINT J4 Newton
-43.3	29285.4	-23943.3	37827.4
-48.3	23511.8	-24058.4	33639.4
-53.3	18747.2	-23869.3	30351.3
-58.3	14739.1	-23518.7	27755.5
-63.3	11296.6	-23074.2	25691.1
-68.3	8279.66	-22571.4	24042.1
-73.3	5585.59	-22028.9	22726.0
-78.3	3136.75	-21456.5	21684.6
-83.3	872.098	-20858.8	20877.1

3.5.1.4 ACCELERATION OF POINT P9

Table 3-8 Acceleration of point P9

POSITION OF JOINT J1 (θ) Degree	X-ACC OF POINT P9 ms^{-2}	Y- ACC OF POINT P9 ms^{-2}	ACCELERATION MAGNITUDE OF P9 ms^{-2}
-43.3	-95.3146	-38.4103	102.763
-48.3	-98.8305	-32.5628	104.057
-53.3	-101.840	-24.7229	104.798
-58.3	-104.172	-15.7762	105.359
-63.3	-105.757	-6.15215	105.936
-68.3	-106.565	3.92462	106.638
-73.3	-106.588	14.3297	107.547
-78.3	-105.828	25.000	108.741
-83.3	-104.305	35.9210	110.317

3.5.1.5 ACCELERATION OF POINT P10

Table 3-9 Acceleration of point P10

POSITION OF JOINT J1 (θ) Degree	X-ACC OF POINT P10 ms^{-2}	Y-ACC OF POINT P10 ms^{-2}	AC- MAGNITUDE OF POINT P10 ms^{-2}
-43.3	-55.2481	-28.7073	62.2612
-48.3	-57.5398	-23.7829	62.2612
-53.3	-59.3937	-18.6775	62.2612
-58.3	-60.7955	-13.4299	62.2612
-63.3	-61.7347	-8.08007	62.2612
-68.3	-62.2040	-2.66882	62.2612
-73.3	-61.1999	2.76281	62.2612
-78.3	-61.7224	8.17334	62.2612
-83.3	-60.7752	13.5217	62.2612

3.5.1.6 ACCELERATION OF POINT P11

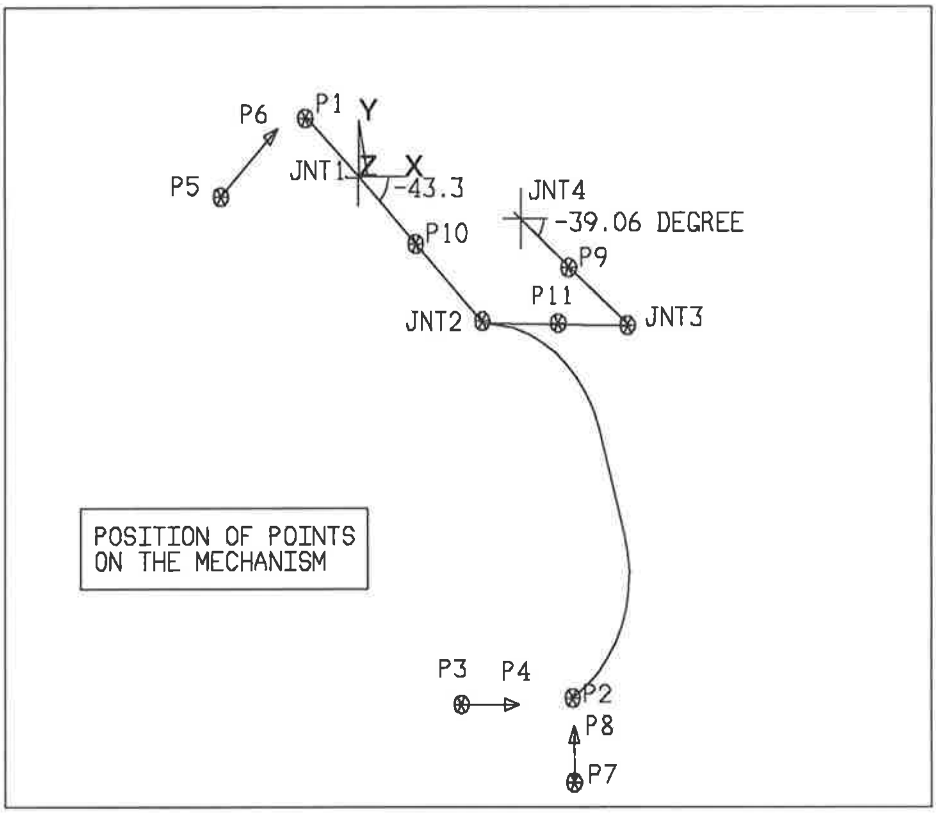
Table 3-10 ACCELERATION OF POINT P11

POSITION OF JOINT J1 (θ) Degree	X-ACC OF POINT P11 ms^{-2}	Y-ACC OF POINT P11 ms^{-2}	AC- MAGNITUDE OF PT P11 ms^{-2}
-43.3	-178.682	-86.6790	198.596
-48.3	-189.083	-73.0095	202.689
-53.3	-196.337	-56.6092	204.335
-58.3	-201.165	-38.6677	204.847
-63.3	-203.881	-19.7740	204.837
-68.3	-204.616	-0.256649	204.616
-73.3	-203.16	19.6806	204.366
-78.3	-200.276	39.9084	204.214
-83.3	-195.159	60.3589	204.280

3.5.1.7 UNKNOWN FORCE

Table 3-11 Unknown force at point P1

POSITION OF JOINT J1 (θ) Degree	UNKNOWN FORCE F1 Newton
-43.3	39049.2
-48.3	37586.4
-53.3	36840.1
-58.3	36609.1
-63.3	36775.5
-68.3	37271.1
-73.3	38065.0
-78.3	39153.4
-83.3	40556.2


P6
P1
Y
JNT1
Z
X
-43.3
P5
JNT4
-39.06 DEGREE
P10
P9
P11
JNT2
JNT3
POSITION OF POINTS
ON THE MECHANISM
P3
P4
P2
P8
P7

Chapter 4

4. Design of the mechanism for strength

4.1 Introduction

The stress analysis of the mechanism is performed by finite element method and the design stress for fatigue strength is carried out using Soderberg criteria soderberg criteria.

4.1.1 Finite element method

The finite element method is a computer based procedure that can be used to analyse structures and continua. It is a versatile numerical method that is widely used to solve problems covering a wide spectrum of engineering analysis and thermal behaviour of physical systems, and their components. Advances in computer hardware have made it easier and very efficient to use finite element software for the solution of complex engineering problems on personal computers. The first major finite element package for general use was NASTRAN developed for NASA by the MacNeal-Schwendler corporation in the mid-1960s (Steel, 1980). The results obtained with a finite element analysis generally give a good approximation. However, a very accurate solution can be obtained if a proper finite element model, based on principles of finite element analysis, is used.

4.1.2 General description of the finite element method and steps of finite element analysis

Calculation of deformations, strains and stresses via classical method of analysis, through longhand solution of the governing equations and boundary conditions describing the problem, is probably the best method to analyse simple structures; nevertheless, their use is tedious when the physical system is complex. In such cases the best alternative is usually a solution obtained with the application of finite element methods.

The primary differences between classical and finite element methods are the way they view the structure and the ensuing solution procedures. Classical methods consider the structure as a continuum whose behaviour is governed by differential equations. The finite element method considers the structure to be an assembly of small finite-sized elements The behaviour of the elements and the overall structure is obtained by formulating a system of algebraic equations that can be readily solved with a computer. The points where the finite elements are interconnected are known as nodes or nodal points, and the procedure in selecting the nodes is termed discretisation, mesh generation or modelling.

Typically, a finite element analysis involves seven steps as explained in the next section. Steps 1,2,4,5 and 7 require decisions made by the user of the finite element program while the rest of the steps are automatically performed by the computer.

4.1.3 Steps of finite element analysis

4.1.3.1 Discretise(model) the structure

The structure is divided into finite elements. The most commonly used basic types of finite elements are truss, beam, plane stress, plane strain, axisymmetric, membrane, plate, shell, solid or brick, tetrahedral, hexahedral, boundary, and gap elements

(Steel,1980). Preprocessors are generally available on most finite element package and they help to create the finite element mesh (FEM). In creating a FEM, accuracy and computational efficiency needs to be taken into consideration. In most cases, use of a complex and very refined model is not justified since it most likely provides computational accuracy at the expense of unnecessarily increased processing time. The type and complexity of the model is dependent upon the type of required results. As a general rule, finite element modelling should start with a simple model. The results from the simple model combined with an understanding of the behaviour of the system determines whether, and at which part of the model needs further refinement. This step is crucial in determining the solution accuracy of the problem.

4.1.3.2 Define the element properties

Depending upon the type of elements that are most suitable to model the physical system, the element properties are defined i.e. the cross-section area, mass moment of inertia, thickness etc.

4.1.3.3 Assemble the element stiffness matrices.

The stiffness matrix of an element consists of coefficients which can be derived from equilibrium, a weighted residual, or an energy method. The element stiffness matrix, automatically assembled by the package, relates the nodal displacements to the applied forces at the nodes. The package then assembles the stiffness matrix of the whole structure.

4.1.3.4 Apply the loads

The loads that act on the physical system are applied at this step. The points of application of concentrated loads are furnished as nodal points, and distributed loads are approximated by a number of concentrated loads. For modal analysis the external-load free structure is analysed.

4.1.3.5 Definition of boundary conditions.

In this step the boundary conditions are specified i.e. the support conditions are provided in which several nodal displacements are set to known values.

4.1.3.6 Solving the system of linear algebraic equations

The sequential application of the above steps leads to a system of simultaneous algebraic equations, solved by the package, where the nodal displacements are the unknowns.

4.1.3.7 Calculation of stresses

Depending upon the type of analysis and the stresses of interest, the program calculates the stresses, reactions, mode shapes or other pertinent information. Generally in most finite element analysis software, post-processors are available which help the user to view the output in a graphical form.

4.2 Finite element analysis of the mechanism

The finite element analysis of the mechanism is performed using ANSYS ™ program. ANSYS ™ is a general-purpose computer program for finite element analysis and design i.e. it can be used for almost any type of finite element analysis in virtually any industry- automobiles, aerospace, railways, machinery, electronics, sporting goods, power generation and transmission, biomechanics etc. It was introduced by Dr. John Swanson and is available from Swanson Analysis Systems Incorporated, Houston USA. Its analysis capabilities are structural static, modal, harmonic response, transient dynamic, spectrum, buckling, nonlinear structural, fracture mechanics, composite and fatigue analysis. The ANSYS ™ program is organised into two basic levels: Begin level and processor (or routine level) as shown below.

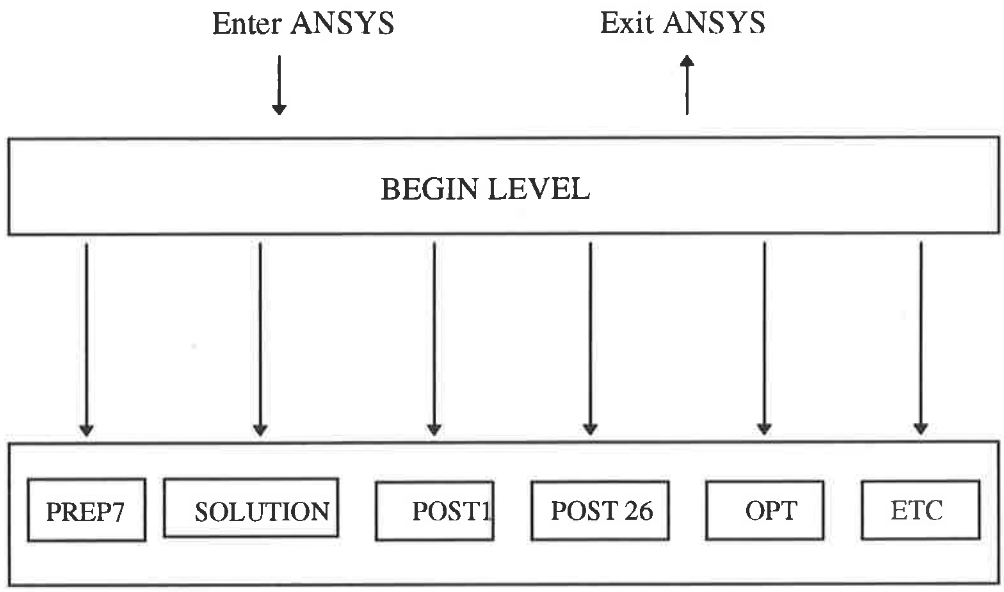


Figure 4-1 ANSYS program organisation

4.2.1 Procedure for Finite element analysis of the mechanism

A two dimensional static finite element analysis is performed on each link of the mechanism using the boundary conditions obtained from the force analysis. The geometry of each link of the mechanism is drawn using the pre-processor module of ANSYS (Prep7) as shown in Fig 4.2 to Fig 4.4. Each link of the mechanism is then meshed with quadrilateral and triangular plane 82 elements, both of them being an eight node two dimensional plane stress element (Fig 4.5 to 4.7). Plane stress element is used because each link of the mechanism fulfils the conditions of plane stress i.e. the thickness is small compared with the other dimensions. As a result the stresses developed along its thickness (z-direction) are very small compared with the stresses in the XY plane and hence all stress components normal to the XY plane are ignored.

Each link of the mechanism is analysed for nine positions (when the tine starts entering the soil and reaches the operating depth of 100mm) in order to determine the maximum of the maximum corresponding stresses which may occur on the links. The starting position of the mechanism is the driver link -83.3°, the coupler link -1.17° and the follower -87.1 °. The final position of the mechanism is -43.3° for the driver link, -0.931° for the coupler link and -39.06° for the follower link.

For every element, isotropic property was assumed by defining the Young's modulus, Poisson ratio and material density. The material density of the links,made of mild steel, were assumed to be 7850 kg/m^3,Young's modulus 200E9 Mpa and Poisson ratio 0.27

.

Constraints were applied at the nodes of one of the revolute joints of each link to avoid rigid body motion and all displacements were set to zero. The finite element analysis then proceeds by employing the body force (gravity and inertia force) and joint forces from the previous force analysis. As a check on the accuracy of the results, the nodal forces where null displacements were specified i.e. the reactions or support points were requested as part of the FEM output. These values were checked to be the same as the values already known from the previous force analysis.

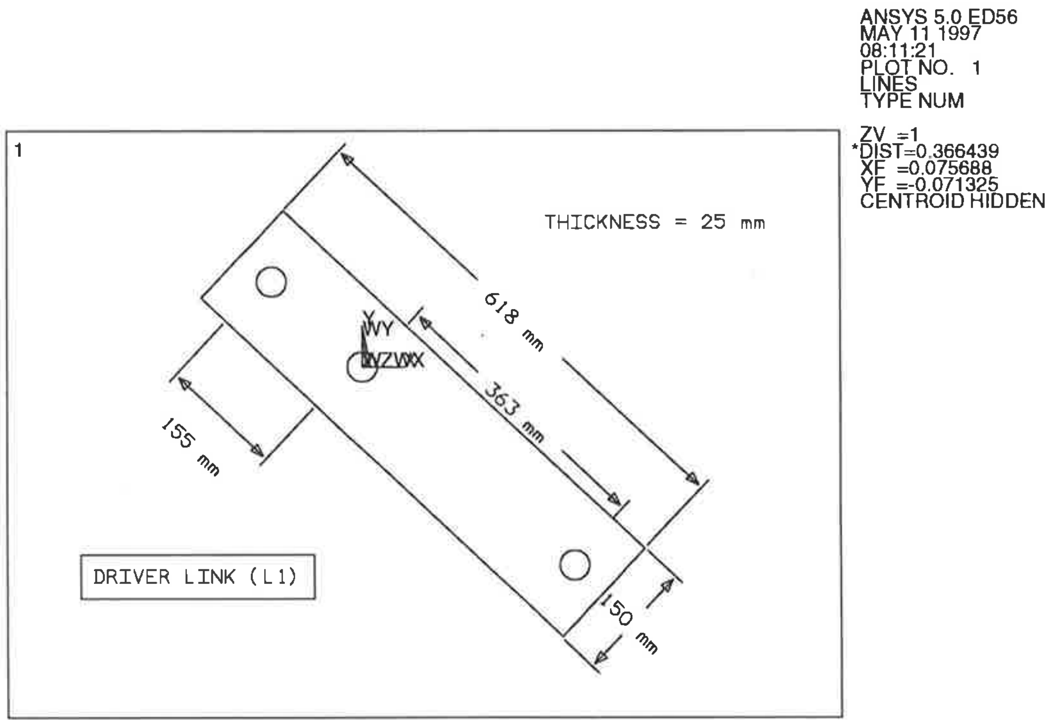


Figure 4-2 Driver link

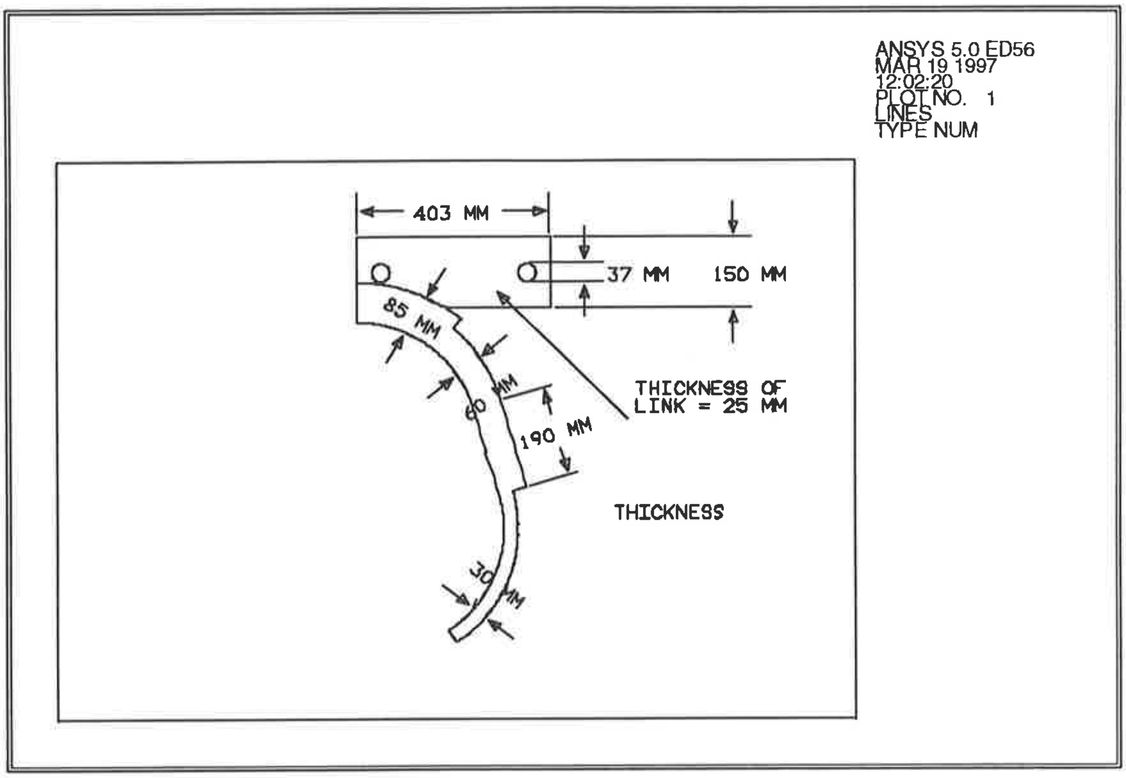


Figure 4-3 Coupler link

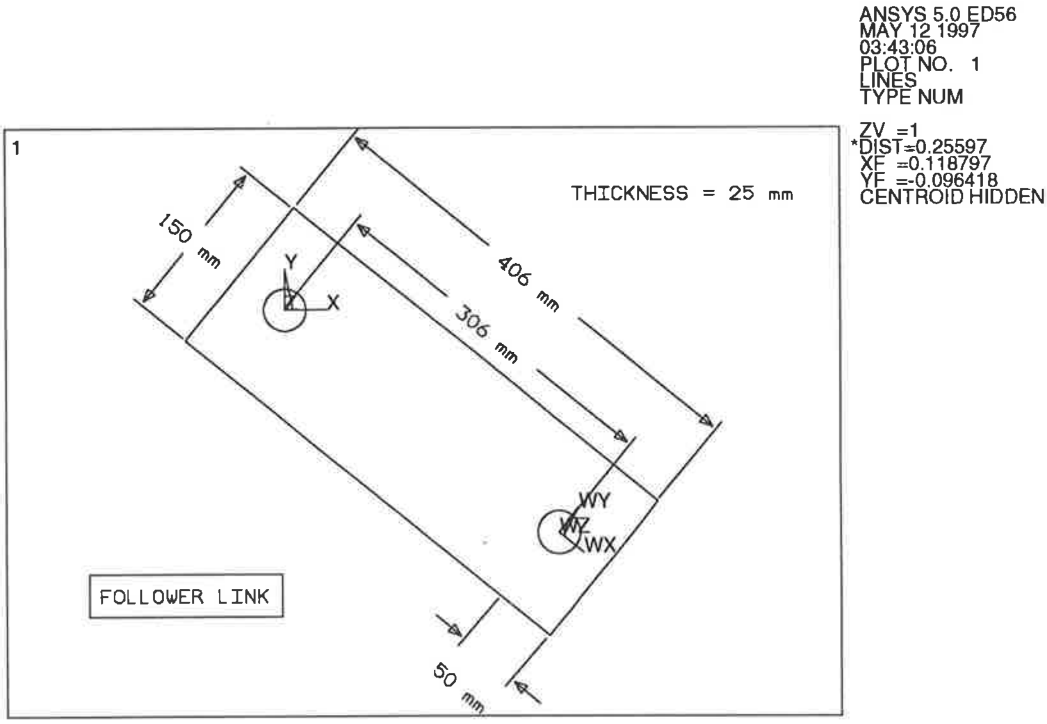


Figure 4-4.Follower link

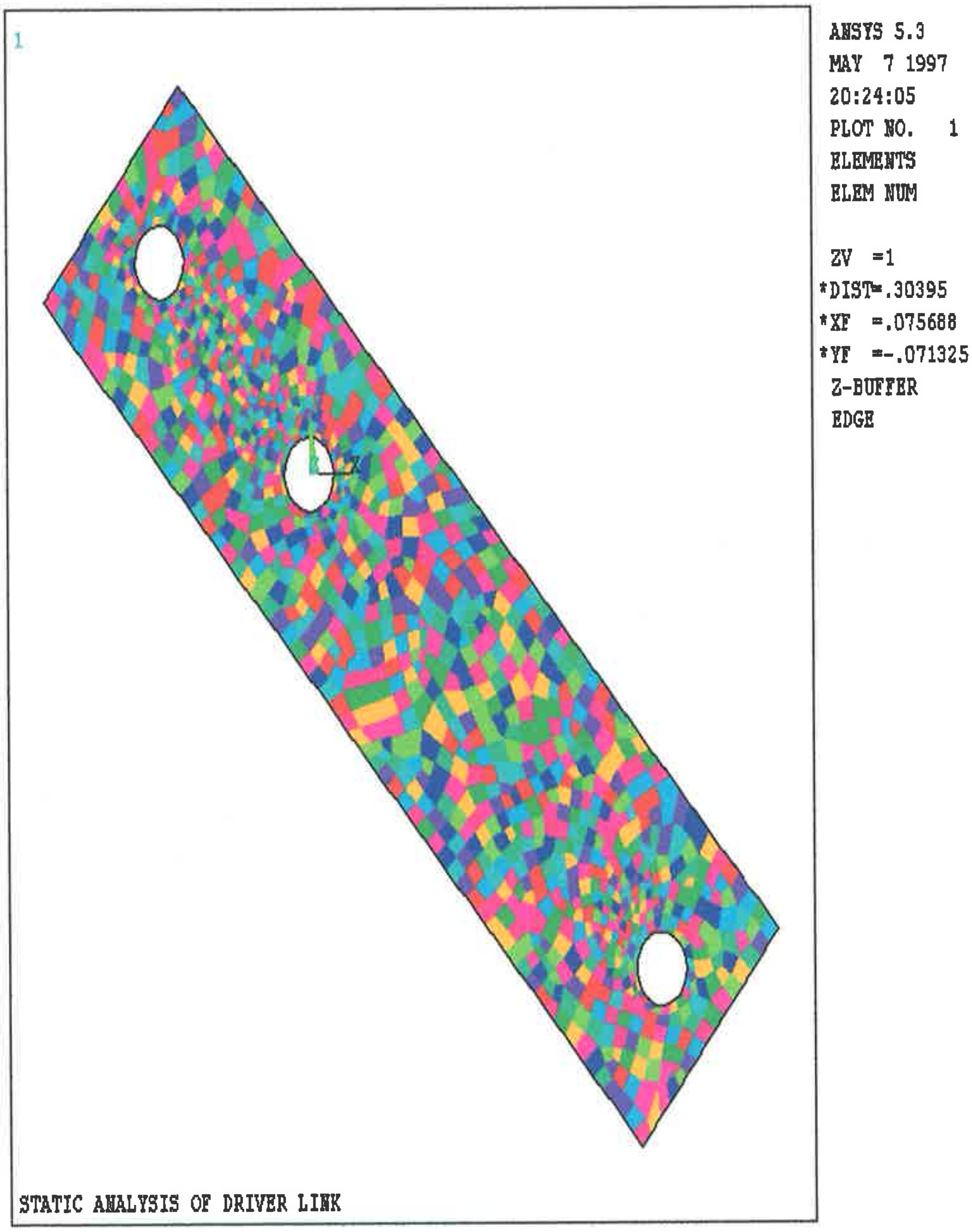


Figure 4-5 Finite element model of driver link

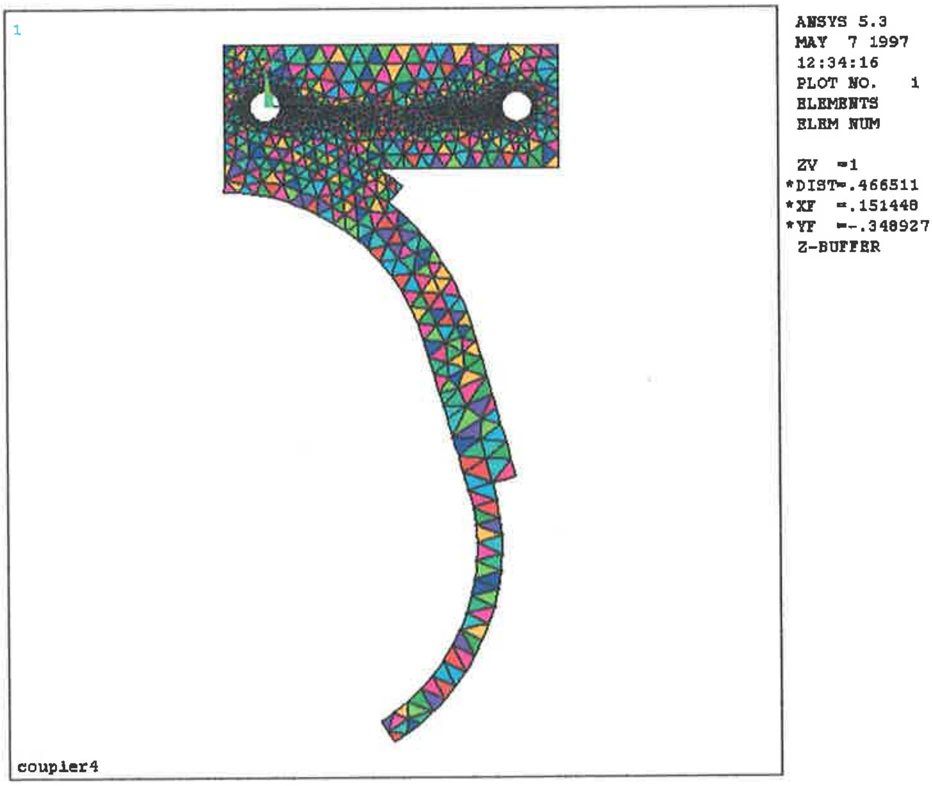


Figure 4-6 Finite element model of coupler link

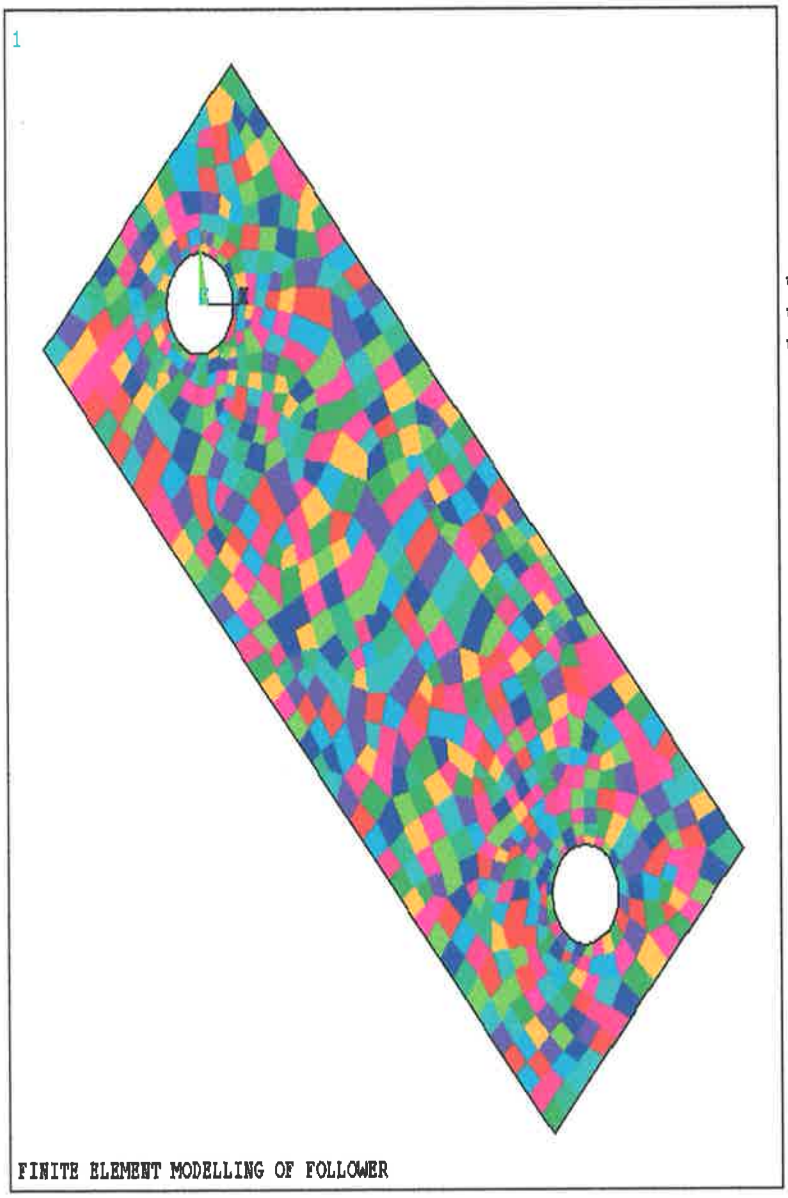


Figure 4-7 Finite element model of follower link

4.3 Structural Design of the driver link

4.3.1 Stress analysis using finite element method

For the stress calculation, D'Alembert's principle is used to convert dynamic loading to a static loading and then a static finite element analysis approach is used to calculate the maximum dynamic stress that the driven link is subjected to during its working condition. D'Alembert's principle states that the resultant of the external forces acting on the body and the inertia force (-ma) of a particle is zero.

Since the approach is to conduct a static finite element analysis for a dynamic case, a convenient reference coordinate system associated with the body for specifying the geometry is important because in a standard static analysis, the reference coordinate system does not move, but in the dynamic case under consideration here, this coordinate system is regarded as sitting on, and moving with one point of the body. Thus a choice of coordinate systems should be guided by considering the ease of visualising its motion as well as the deformations of the link relative to it. In the present case the joint JNT1 (Figure 3.5) is regarded as the origin of the coordinate system.

The next step is to specify an appropriate set of boundary conditions. Since part of the criteria for selection of the reference coordinate system was ease of interpretation of results, the best choice will be to set all the displacements of the node at the origin to be zero. In general there will be known nodal forces acting there due to body force effects and possibly due to external forces as well. However, in the FEM modelling process, these are simply ignored as they act on a constrained node. At all other nodes, external loading effects are imposed as in a standard static FEM analysis, but no other pure displacement or rotation is specified. The input data required for static analysis of the driver link are the material properties, boundary conditions, components of its joint forces and its centroid acceleration. The components of the joint forces are applied on 48 nodes around the joint of the finite element model. Appendix 2 shows a complete input listing for the finite element analysis of the driver link.

4.3.1.1 Results of the driver link

The result of the finite element analysis of the driver links shows that the maximum stress occurs when the link is in the first position and its value is 71.1 Mpa. as shown in figure 4-8. and Appendix 3. The reaction at the constrained joint (i.e, at the point of attachment of the hydraulic cylinder) is the same as the forces obtained from the previous force analysis (section 3.5.1.7). It implies that the finite element analysis is accurate.

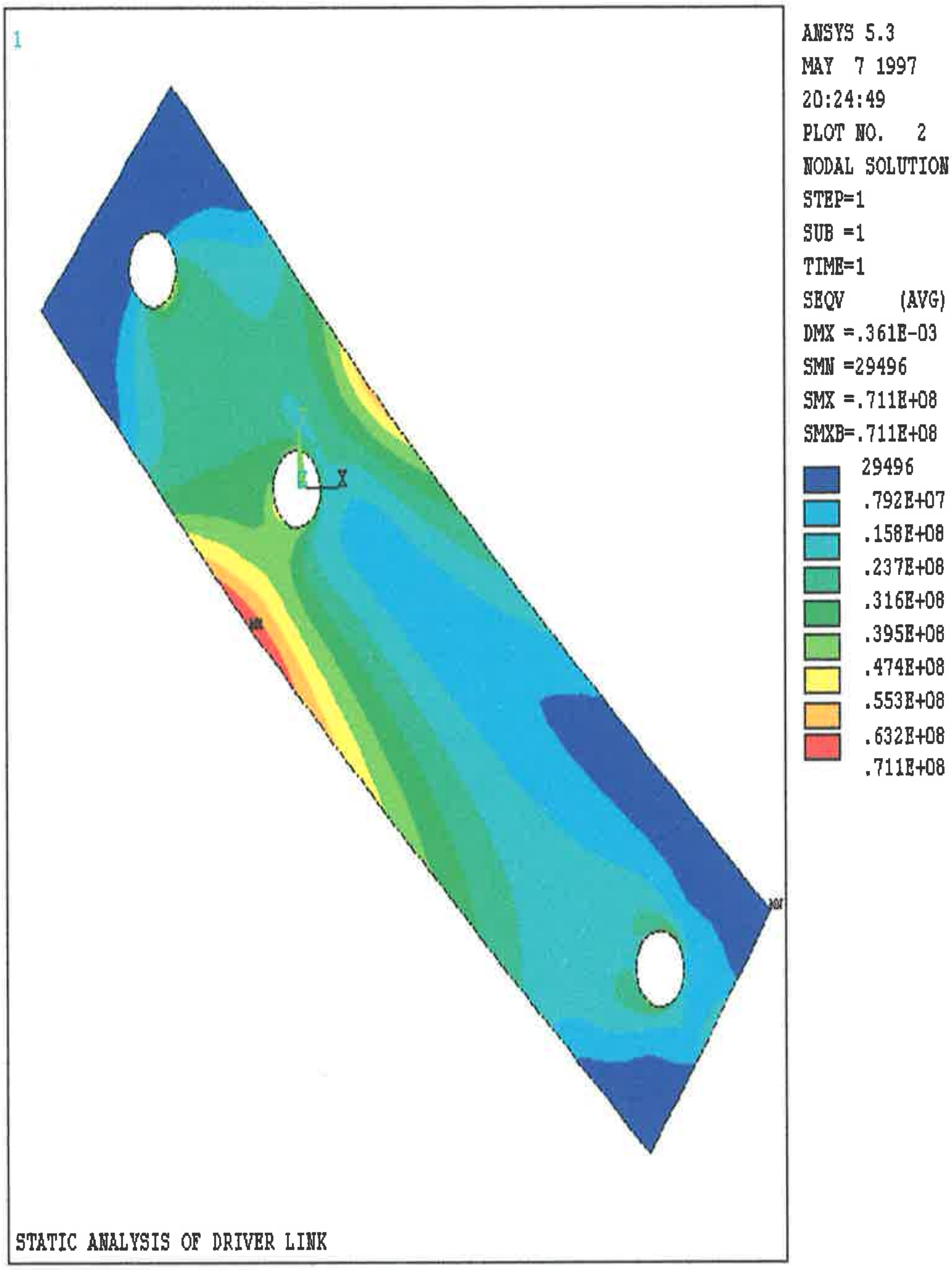


Figure 4-8 Stress contours of the driver link

4.3.2 Fatigue analysis of the driver link using Soderberg criteria

For the fatigue analysis Soderberg criteria is used i.e,

$\sigma_m / \sigma_y + K \sigma_a / \sigma_e \leq 1/N$ **Equation 4-1**

where,

σ_m = mean stress = $(\sigma_{max} + \sigma_{min})/2$

σ_y = minimum yield strength of the material = 350 Mpa (AS3678)

σ_a = alternating stress = $(\sigma_{max} - \sigma_{min})/2$

σ_e = endurance limit = 0.5 σ_u if $\sigma_u < 1400$ or else it is equal to 700 if $\sigma_u \geq 1400$ (Shigley)

σ_u = utimate yield stress of the of the material = 450 Mpa (AS 3678)

K = stress concentration factor

N = factor of safety

Since $\sigma_{min} = 0$ (Fig 3-2) , then $\sigma_m = \sigma_a = \sigma_{max}/2 = 71.1$ Mpa ;

the stress concentration factor is taken as unity because it has already being taken into account during the finite element analysis, the endurance limit $\sigma e = 0.5\ \sigma_u = 0.5 \mathrm{x}\ 450$ =225 Mpa. Substituting these values in equation 4-1 the factor of safety N = 1.93 is obtained. Hence the driver link is safe for the choosen dimensions, load and material.

4.4 Structural design of the coupler link

4.4.1 Finite element analysis of the coupler link

For the finite element analysis of the coupler link, a similar static finite element analysis approach is performed. The coupler is modelled as one unit consisting of the tine and the link to which it is attached. The thickness of the link is 25 mm and the thickness of the tine is 40 mm.

The link is constrained at one of the joints JNT2 (Figure 3.3) with null displacement and the components of the other joint forces are applied on 48 nodes around joint JNT3 (Figure 3.3) together with the components of the accelerations at the centroid of the link.

The results of the finite element analysis of the coupler link for different positions show that the maximum stress occurs when the coupler link is in the fifth position,when the driver link is at -63.3 degrees. The maximum corresponding stress is 138 Mpa in the link and 310 Mpa in the tine as shown in Figure 4.9-4.10 and Appendix 3 respectively.

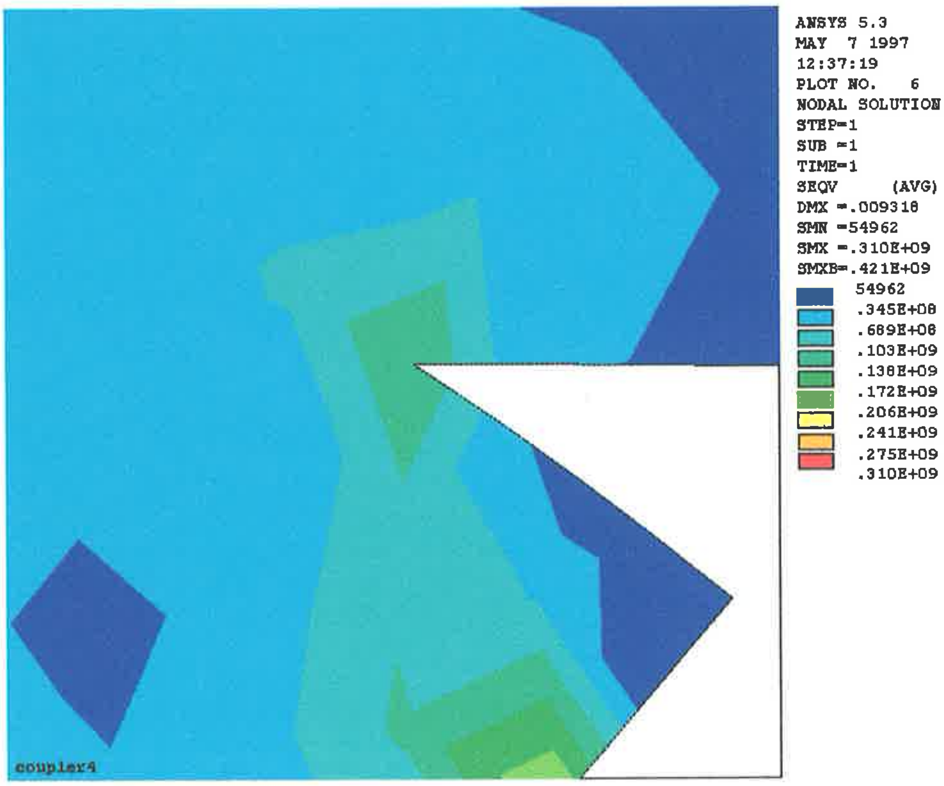


Figure 4-9 Stress contours at the junction of the link and the tine

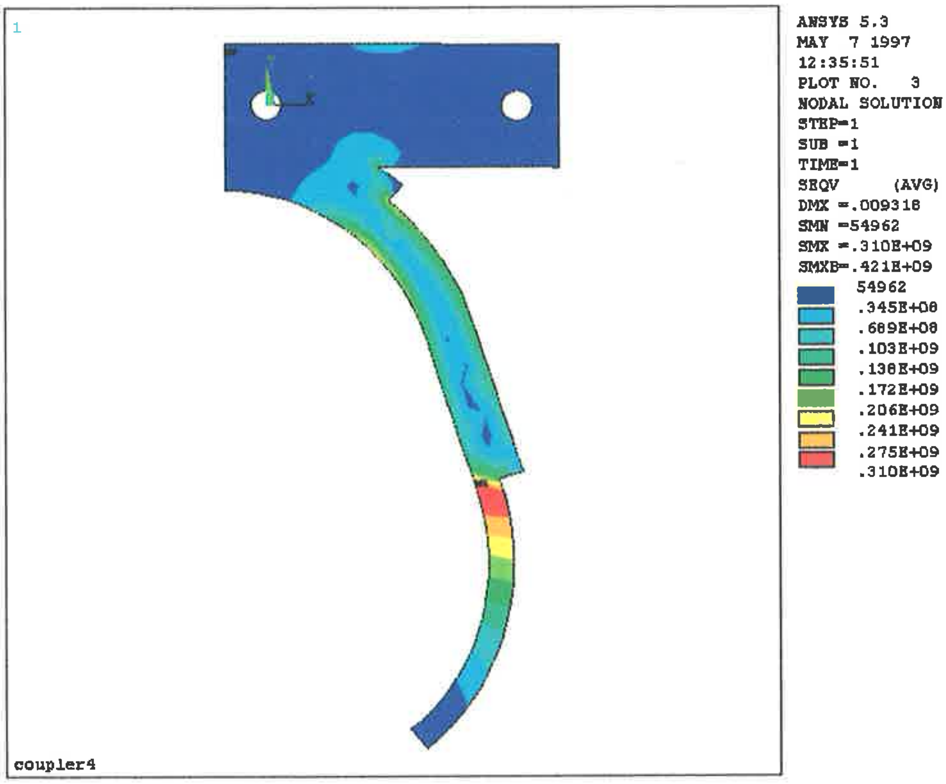


Figure 4-10 Stress contours of the link and tine

Since the objective is to design the link, not the tine because a commercial tine will be attached to the link, the design stress for fatigue analysis is taken as 138 Mpa.

4.4.2 Fatigue analysis of the coupler link

The fatigue analysis of the coupler link is again peformed by using Soderberg equation, Equation 4.1. The maximum stress obtained from the finite element analysis for the coupler link is 138 Mpa, the minimum yield strength of the material is 350 Mpa (mild steel) and the endurance limit is 225 ($\sigma_e = 0.5\ \sigma_u$). Substituting the above values in Equation 4.1 and assuming the stress concentration factor to be unity, we get

138/350 + 138/225 = 1/N **Equation 4-2**

From equation 4.2 we get N = 0.99 ≈ 1.

Since the value of the factor of safety is unity, it implies that the coupler is safe from the fatigue point of view and hence the choosen dimension of the coupler link is retained. This factor of safety is the worst possible that can happen corresponding to situation, explained in section 3.2(ii), that will never happen. In other words, the real factor of safety will be greater than unity.

4.5 Structural design of the follower link

4.5.1 Finite element analysis of the follower link

A similar approach of static finite element analysis as explained in Section 4.3.1 is performed on each position of the follower link. The link is constrained at joint JNT4 (Figure 3.3) with zero displacement and components of the forces are applied around 48 nodes of the other joint together with the components of the acceleration at the centroid of the follower. The result of the finite element analysis obtained for different positions shows that the maximum stress occurs when the follower link is in the first position and the maximum corresponding stress is 78.8 Mpa as shown in Figure 4.11 and Appendix 3.

4.5.2 Fatigue analysis of follower link

The fatigue analysis of the follower link is also performed by using Soderberg equation, as shown in Equation 4.1. The maximum stress obtained from the finite element analysis for the follower link is 78.8 Mpa, the minimum yield strength of the material is 350 Mpa and the endurance limit is 225 Mpa. Substituting the above values in Equation 4.1 and assuming the stress concentration factor to be unity, we get the factor of safety N = 1.74. Since the factor of safety is greater than unity, hence the follower link is safe for the choosen dimensions, loads and material.

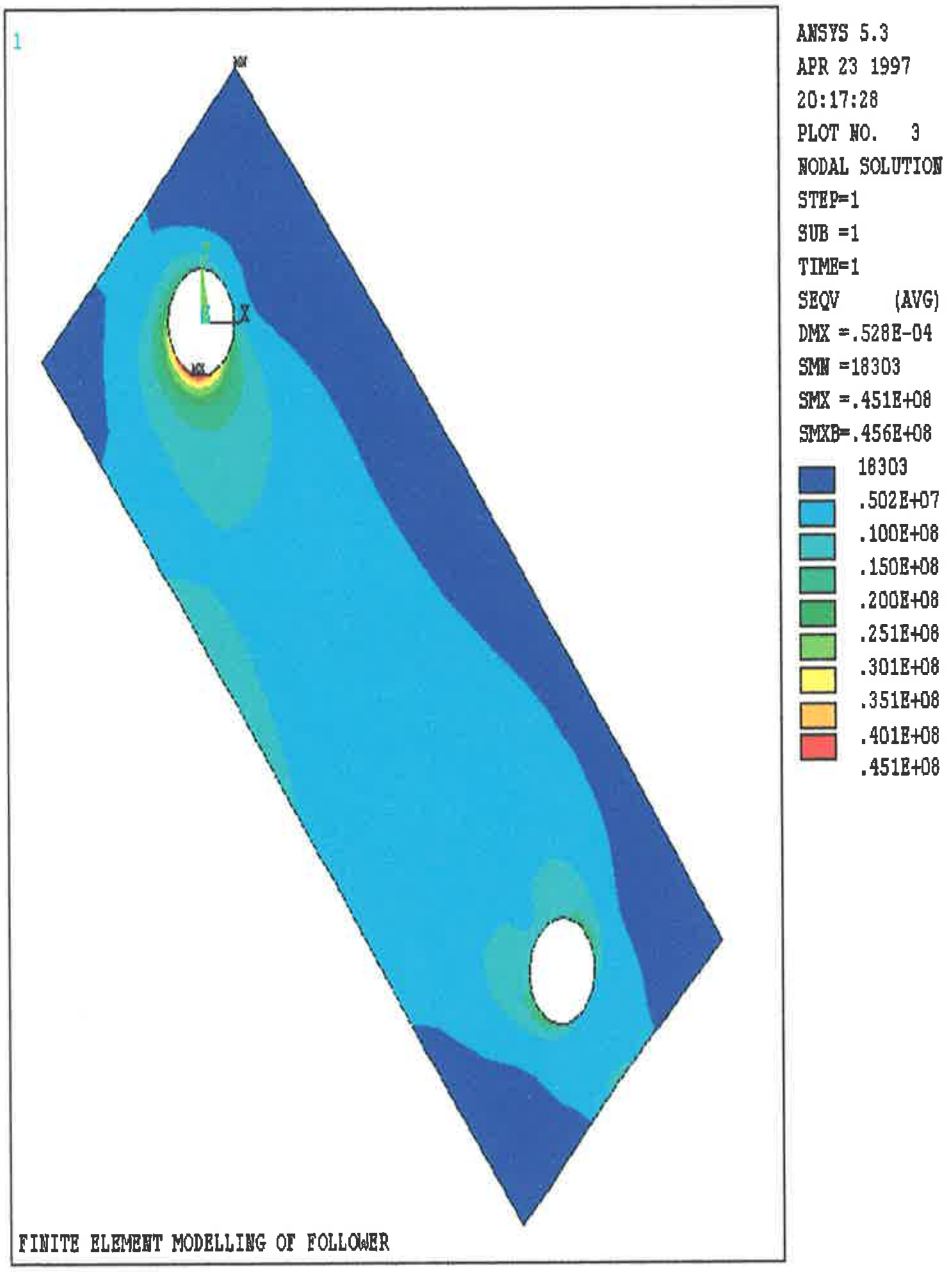


Figure 4-11 Stress contours of the follower link

Chapter 5

5. General conclusions

Tillage is an important component in farming systems. It is one of the most expensive and time consuming activities which farmers conduct. The high cost of fuel and breakage of implements which results from impredictable high impact loading both contribute to this when the implement is working in the field condition. The trend towards larger tractors working at greater speed has resulted in a higher level of impact loading on cultivation implements. Many types of impact loading devices are available on the market but they are either heavily constructed or they do not meet the requirement of a particular site condition. Nowadays, due to the adverse effect of weight (compaction and cost), tillage implement designers are optimising their design in order to alleviate the problem of compaction and reduce the material costs. One technique which has emerged due to advances in computer technology and lower cost of computers is computer aided design.

In this project, an existing partially-parallel stump-jump mechanism was redesigned using computer-aided methodology which allows a tillage tool to lift from the soil in order to avoid damage caused by obstacles. For the kinematic analysis of the four bar linkage of the mechanism, Lincages-4 computer software package was used to calculate the size of the links such that the kinematic requirement of the partially-parallel stump-jump mechanism was fulfilled. The Lincages-4 package has proved to be a good tool for sizing of a four bar linkage in order to sustain a prescribed motion. In the present study the result obtained from the kinematic analysis shows that the dimension of the four bar linkage of the partially-parallel stump-jump mechanism has been considerably reduced but still retains the kinematics of the existing design. The driver link has been reduced from 600 to 363 mm, the coupler link from 400 to 303 mm and the follower link from 400 to 306 mm.

For the design of the mechanism, separate force analysis and finite element analysis were performed. For the force analysis a rigid body motion package (MICRO-MECH) was used to calculate the joint and inertia forces and stress analysis, a finite element analysis package (ANSYS) was used for stress calculation . This methodology was used because the computer-aided technique of dynamic simulation of mechanisms and finite element structural modelling have developed along independent lines. Moreover, there exists computer software packages such as ADAMS (Automated Dynamic Analysis of Mechanical Systems) which enable the result of a rigid body dynamic simulation to a finite element structural modelling package. This was not carried out in this project due to the non availability of ADAMS software package. Nevertheless, the results of forces analysis obtained from MICRO-MECH were successfully used in the ANSYS finite element package for stress calculations. The prediction of stresses from ANSYS was within the expectation i.e. the maximum stress in the link occur when the mechanism starts entering the soil. This is quite obvious because when the tine starts entering the soil it will be subjected to high impact load leading to high stresses after which the stresses start to decrease. It is worth mentioning that due to the unpredictable frequency of obstacles that might be encountered during use, the mechanism has been designed for the worst possible case of fatigue on the assumption that once the mechanism reaches the operating depth, it encounters with obstacle, retracts, return to the operating position and come across another obstacle and the cycle continues. This assumption was to simplify the design procedure as the real operating conditions depends upon the soil condition. Taking into account the above assumption, the stresses as predicted by the finite element analysis would be on the conservative side

References

Bidhendi, I. M. , Fielke, J. M. and Riley, T. W. (1990). Computer Aided Design Applied to Chisel Plough Tines. Conference of Agricultural Engineering Toowoomba Queensland pp 54-57

Blair, J.R. Stump Jump (1969) Disc plough Linkages - Mathematical Models and their Solutions. J. R. , Journal of Agricultural Engineering Research **14** (3) 263-283

Bowditch, H. G., Wills, A. H.(1965). The Dynamics and Kinematics Characteristics of stump Jump Mechanism. The University of New South Wales School of Mechanical Engineering.

Chace, Milton A. (1978). To Simulate Machinery vehicles.' Agricultural Engineering **59** (11) pp 16-18

Chi, L. and Kushwaha, R.L. (1989). Finite element analysis of soil forces on different tillage tool shapes. American Society of Agricultural Engineers. Paper N0 89-1103

Claar II, P. W. , and Chmielewski, W. S. (1992). Modelling Linkages with Alternative C&E Simulation Methodologies SAE Technical paper series No. 921705

Clyde, A. W. Cushion hitch developments. (1949) Agricultural Engineering St Joseph Micham. 30(4) 169

Dandu, R., Tennyson, S. A. and Mehta, S. I. (1991) Optimization of a Farm Seeding and fertilising Spring-Loaded Four-Bar Mechanism.SAE Technical paper series. paper series

Doi, J. and Miyake, T. Automated geometric (1993). Modelling of a tillage blade. Journal of Agricultural Engineering research **55**, pp 207-216

Hanavan, M. T. and Reece, A. R (1961) Impact Loads on Tractor Implements. Journal of Agricultural Engineering Research **6**, pp 161-168

References

Huang, R. C. , and Wiley, J. C (1985) Combining Rigid Body Dynamics and Finite element Structural Models - A Comparison of Three approaches. ' ANSYS Conference Proceedings pp 6.47-6.52.

Kaufman, R. E. (1978) Mechanism Design by Computer Journal of Machine Design **24,** pp 94-100

Macmillan, R.H., Burrow, R.P. and Vanvugth M.J.F.(1986) Conference on Agricultural Engineering Adelaide pp 209-214.

McConville, J. B., and Steigerwald, M. F. (1985). The Use of ADAMS to Create Realistic Boundary Conditions for Finite Element Evaluation of mechanisms. ANSYS Conference Proceedings pp 6.54-6.68

McKay, M.E. and Hill, R.J. (1980). A new generation scarifier. Conference on Agricultural Engineering , Geelong, Victoria pp264-265

Quick, G.R. (1982). Analysis, Simulation and Evaluation of Stump-jump Mechanisms on Australian Broadacre Tillage Equipment. Conference of Agricultural Engineering Armidale 22-24 August pp 207-212

Quick, G.R. , Brown, G.A. and Cosgrove, D.J. (1984). A study of stump-jump plow mechanisms -pivot moment and friction aspects. Conference on Agricultural Engineering Bundaberg pp 401-402

Riley, T.W. and Fielke J. M. (1990). The Design and Evaluation of a Partially Parallel Stump Jump Mechanism. Conference on Agricultural Engineering Toowoomba Queensland pp 118-122

Riley, T.W., Fielke, J.M. and Chaplin, D. (1986). Analysis of stump jump Mechanisms subjected to Dynamic loading .Conference on Agricultural Engineering Adelaide.

References

Robotham, B. G., Norris, C. P., and Ryan, I. A. (1983). Commercial Chisel Plough Tynes. An Engineering Comparison. Queensland Department of Primary Industries Bulletin Series QB83002.

Sandor, George N., Erdman, Arthur G.(1984). Advanced Mechanism Design. Prentice, Inc., Englewood Cliffs, New Jersey, pp 345-352.

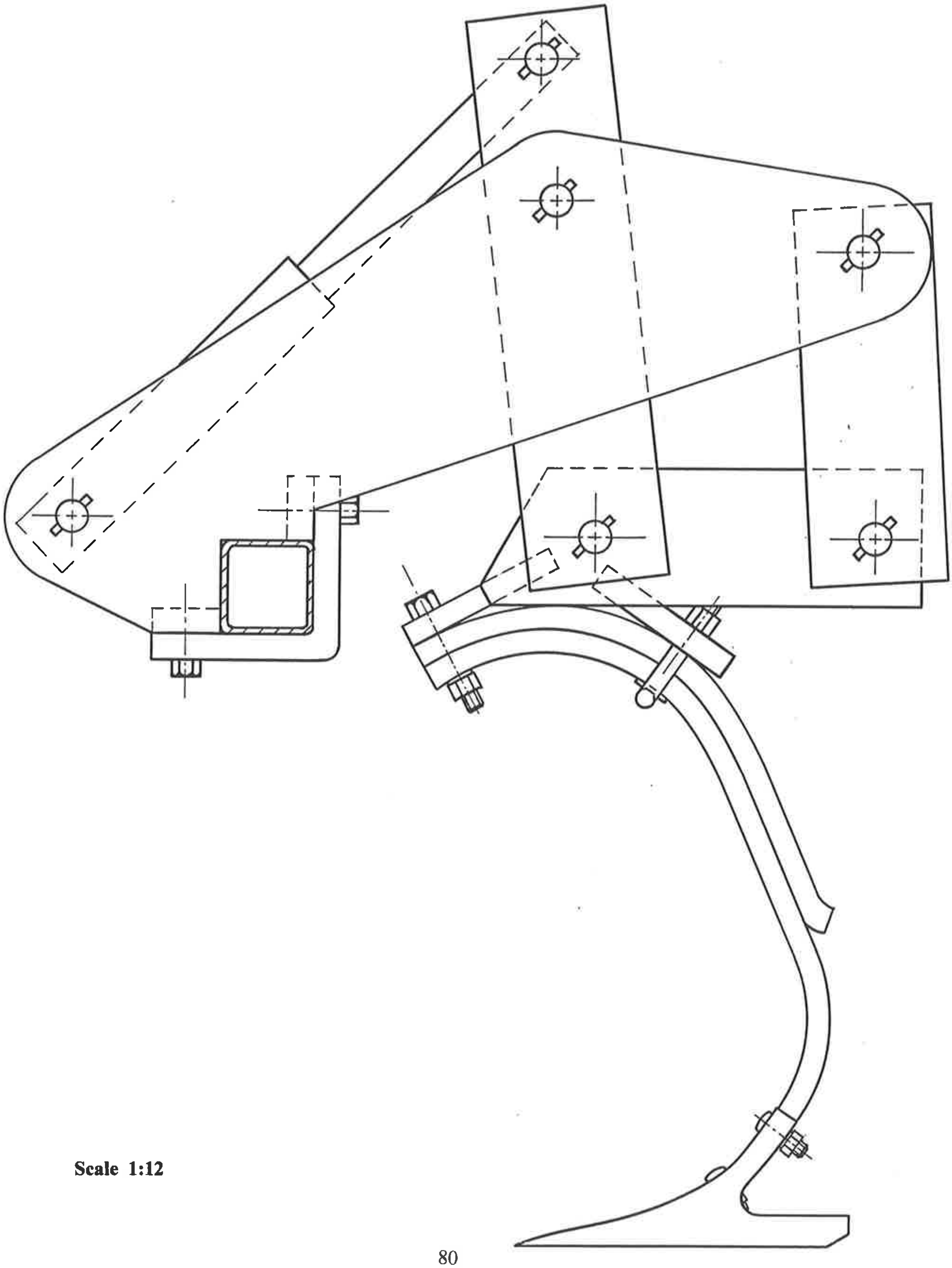
Steele, Jeffrey M. (1980). Applied finite element modelling-Practical problem solving for engineers. Marcel Dekker, Inc. pp 1

Studman, C. J.(1975) Impact Loads on Soil-working Surfaces. Journal of Agricultural Engineering Research 20, pp 413-422

Yu, D. and Wills, B. M. D. (1987). Dynamic Analysis of Impact Loading on Cultivation Implements. Journal of Agricultural Engineering Research **37**, pp 267-278

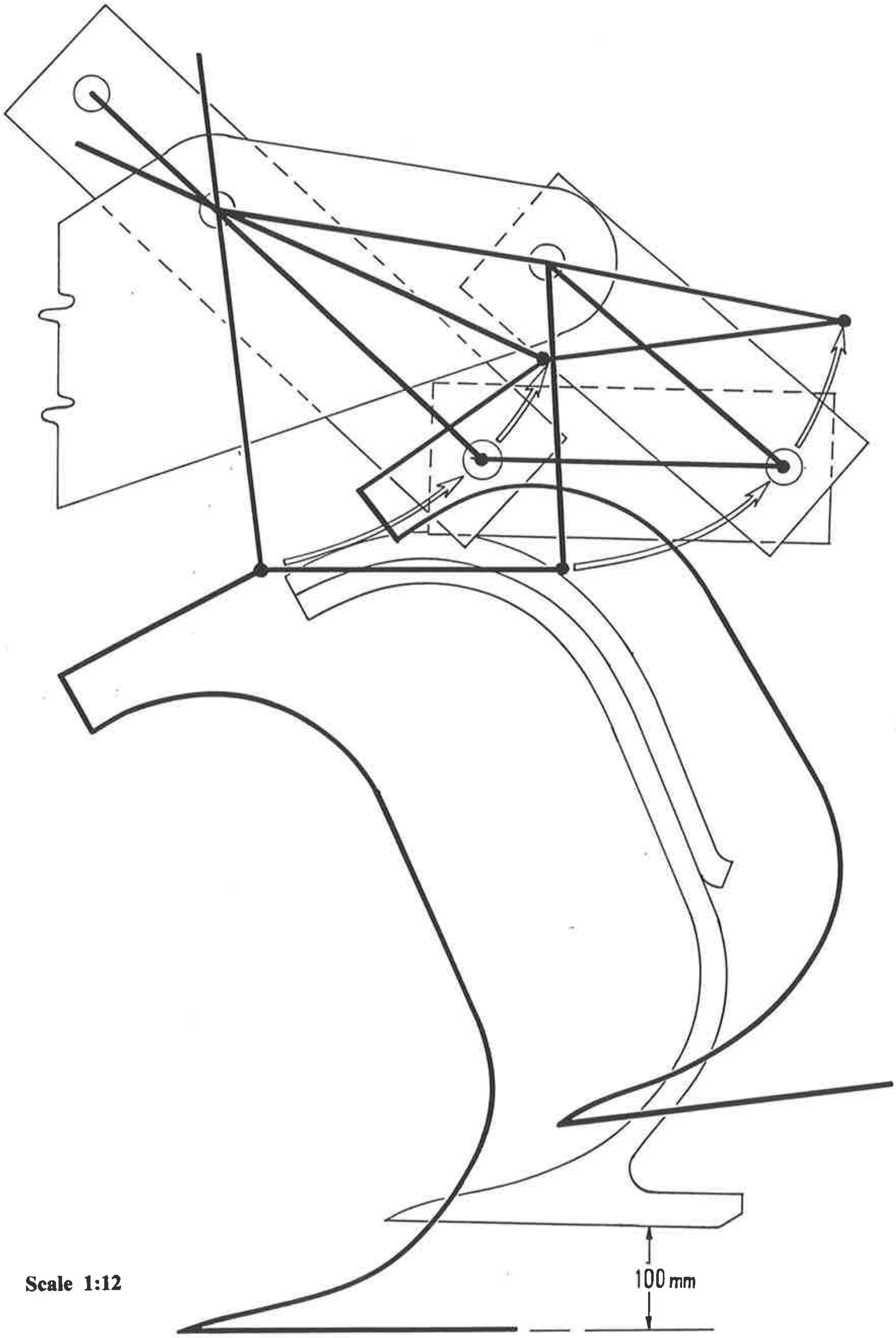
Appendix 1

(a) Detail of the joint and tine at rest



Scale 1:12

(b) The effects of striking an obstruction



Scale 1:12

Input listing for the finite element analysis of the driver link

PRINT S   NODAL SOLUTION PER NODE

***** POST1 NODAL STRESS LISTING *****

LOAD STEP=   1 SUBSTEP=   1
TIME=   1.0000   LOAD CASE=   0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1	48084.	76038.	.00000	-4237.2	.00000	.00000
2	.19298E+06	.12036E+06	.00000	-44382.	.00000	.00000
3	2270.5	-23237.	.00000	-9524.2	.00000	.00000
4	-70773.	-51603.	.00000	2454.3	.00000	.00000
5	-.32914E+08	.32394E+08	.00000	-.14678E+07	.00000	.00000
6	-.89053E+07	-.36018E+07	.00000	-.39379E+07	.00000	.00000
7	.17991E+06	-.24948E+06	.00000	18104.	.00000	.00000
8	.34702E+07	.10222E+08	.00000	.37256E+07	.00000	.00000
9	.25674E+08	-.14185E+08	.00000	-.72456E+07	.00000	.00000
10	.26263E+08	-.27827E+07	.00000	.72464E+07	.00000	.00000
11	-.31471E+08	.67543E+07	.00000	.10887E+07	.00000	.00000
12	-.57056E+07	.20699E+08	.00000	-.24881E+08	.00000	.00000
13	-.18175E+08	-.10014E+08	.00000	.31439E+06	.00000	.00000
14	-.30283E+07	.24265E+08	.00000	-.15708E+08	.00000	.00000
15	.85605E+07	-.44328E+07	.00000	-.94828E+07	.00000	.00000
16	.33658E+08	.41530E+07	.00000	-.13297E+08	.00000	.00000
18	-74115.	-.12656E+06	.00000	.12650E+06	.00000	.00000
20	-.51011E+06	-.56795E+06	.00000	.54034E+06	.00000	.00000
22	-.98865E+06	-.10176E+07	.00000	.10156E+07	.00000	.00000
24	-.14830E+07	-.13646E+07	.00000	.13747E+07	.00000	.00000
26	-.13987E+07	-.12805E+07	.00000	.11997E+07	.00000	.00000
28	-.73763E+06	-.65986E+06	.00000	.60020E+06	.00000	.00000
30	.73944E+06	.81227E+06	.00000	-.83932E+06	.00000	.00000
32	.29283E+07	.28341E+07	.00000	-.29527E+07	.00000	.00000
34	.56159E+07	.52517E+07	.00000	-.54810E+07	.00000	.00000
36	.85894E+07	.78256E+07	.00000	-.82177E+07	.00000	.00000
38	.11606E+08	.10467E+08	.00000	-.11024E+08	.00000	.00000
40	.14603E+08	.13125E+08	.00000	-.13847E+08	.00000	.00000
42	.17605E+08	.15808E+08	.00000	-.16678E+08	.00000	.00000
44	.20591E+08	.18516E+08	.00000	-.19528E+08	.00000	.00000
46	.23657E+08	.21183E+08	.00000	-.22381E+08	.00000	.00000
48	.26652E+08	.23859E+08	.00000	-.25204E+08	.00000	.00000
50	.29569E+08	.26367E+08	.00000	-.27903E+08	.00000	.00000
52	.32237E+08	.28722E+08	.00000	-.30386E+08	.00000	.00000
54	.34508E+08	.30766E+08	.00000	-.32510E+08	.00000	.00000
56	.36311E+08	.32318E+08	.00000	-.34168E+08	.00000	.00000
58	.37430E+08	.33240E+08	.00000	-.35172E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP=   1 SUBSTEP=   1
TIME=   1.0000   LOAD CASE=   0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
60	.37777E+08	.33481E+08	.00000	-.35443E+08	.00000	.00000
62	.37334E+08	.33047E+08	.00000	-.35028E+08	.00000	.00000
64	.36429E+08	.32262E+08	.00000	-.34264E+08	.00000	.00000
66	.35288E+08	.31201E+08	.00000	-.33173E+08	.00000	.00000
68	.34064E+08	.30139E+08	.00000	-.32042E+08	.00000	.00000
70	.32885E+08	.29116E+08	.00000	-.30948E+08	.00000	.00000
72	.31781E+08	.28145E+08	.00000	-.29928E+08	.00000	.00000
74	.30801E+08	.27249E+08	.00000	-.28957E+08	.00000	.00000
76	.29780E+08	.26399E+08	.00000	-.28037E+08	.00000	.00000
78	.28847E+08	.25589E+08	.00000	-.27176E+08	.00000	.00000
80	.27914E+08	.24768E+08	.00000	-.26301E+08	.00000	.00000
82	.27041E+08	.23993E+08	.00000	-.25458E+08	.00000	.00000
84	.26124E+08	.23175E+08	.00000	-.24616E+08	.00000	.00000
86	.25225E+08	.22366E+08	.00000	-.23754E+08	.00000	.00000
88	.24328E+08	.21571E+08	.00000	-.22907E+08	.00000	.00000
90	.23419E+08	.20768E+08	.00000	-.22053E+08	.00000	.00000
92	.22516E+08	.19961E+08	.00000	-.21201E+08	.00000	.00000
94	.21611E+08	.19157E+08	.00000	-.20347E+08	.00000	.00000
96	.20707E+08	.18356E+08	.00000	-.19497E+08	.00000	.00000
98	.19805E+08	.17553E+08	.00000	-.18645E+08	.00000	.00000
100	.18898E+08	.16751E+08	.00000	-.17790E+08	.00000	.00000
102	.17983E+08	.15941E+08	.00000	-.16930E+08	.00000	.00000
104	.17058E+08	.15123E+08	.00000	-.16059E+08	.00000	.00000
106	.16116E+08	.14286E+08	.00000	-.15170E+08	.00000	.00000
108	.15150E+08	.13427E+08	.00000	-.14258E+08	.00000	.00000
110	.14143E+08	.12533E+08	.00000	-.13305E+08	.00000	.00000
112	.13082E+08	.11602E+08	.00000	-.12309E+08	.00000	.00000
114	.11942E+08	.10584E+08	.00000	-.11234E+08	.00000	.00000

116	.10692E+08	.94657E+07	.00000	-.10045E+08	.00000	.00000
118	.92554E+07	.81933E+07	.00000	-.87001E+07	.00000	.00000
120	.76507E+07	.66872E+07	.00000	-.71388E+07	.00000	.00000
122	.57846E+07	.49685E+07	.00000	-.53347E+07	.00000	.00000
124	.36882E+07	.30643E+07	.00000	-.33738E+07	.00000	.00000
126	.16764E+07	.12053E+07	.00000	-.15065E+07	.00000	.00000
128	-.13213E+06	-.24424E+06	.00000	.11390E+06	.00000	.00000
130	-.11965E+07	-.10362E+07	.00000	.10432E+07	.00000	.00000
132	-.15145E+07	-.11658E+07	.00000	.12573E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
134	-.11591E+07	-.75625E+06	.00000	.88748E+06	.00000	.00000
136	-.43547E+06	-.12156E+06	.00000	.29213E+06	.00000	.00000
139	-.45316E+06	-.28689E+06	.00000	-.29347E+06	.00000	.00000
141	-.14632E+07	-.81219E+06	.00000	-.86531E+06	.00000	.00000
143	-.13353E+07	-.11370E+07	.00000	-.13118E+07	.00000	.00000
145	-.62120E+06	-.71852E+06	.00000	-.51103E+06	.00000	.00000
147	.16821E+07	.15430E+07	.00000	.16582E+07	.00000	.00000
149	.54505E+07	.54204E+07	.00000	.55014E+07	.00000	.00000
151	.91847E+07	.98601E+07	.00000	.94411E+07	.00000	.00000
153	.10806E+08	.12318E+08	.00000	.11004E+08	.00000	.00000
155	.87965E+07	.10791E+08	.00000	.93668E+07	.00000	.00000
157	.55120E+07	.70688E+07	.00000	.63154E+07	.00000	.00000
159	.26054E+07	.35157E+07	.00000	.32129E+07	.00000	.00000
161	.77884E+06	.13817E+07	.00000	.12599E+07	.00000	.00000
163	36261.	.14059E+06	.00000	.15119E+06	.00000	.00000
165	-52680.	-.14493E+06	.00000	-43866.	.00000	.00000
168	-32755.	-.13218E+06	.00000	60228.	.00000	.00000
170	55035.	-2017.0	.00000	-23330.	.00000	.00000
172	.17509E+06	76777.	.00000	-78648.	.00000	.00000
174	87221.	16976.	.00000	-12428.	.00000	.00000
176	-.23057E+06	-.28857E+06	.00000	.26292E+06	.00000	.00000
178	-.54353E+06	-.53674E+06	.00000	.52074E+06	.00000	.00000
180	-.67942E+06	-.61400E+06	.00000	.61541E+06	.00000	.00000
182	-.65108E+06	-.52704E+06	.00000	.58725E+06	.00000	.00000
184	-.53672E+06	-.47506E+06	.00000	.50495E+06	.00000	.00000
186	-.59457E+06	-.42872E+06	.00000	.56788E+06	.00000	.00000
188	-.73207E+06	-.58520E+06	.00000	.66363E+06	.00000	.00000
190	-.10665E+07	-.92210E+06	.00000	.10101E+07	.00000	.00000
192	-.15930E+07	-.14013E+07	.00000	.15017E+07	.00000	.00000
194	-.22380E+07	-.19882E+07	.00000	.21137E+07	.00000	.00000
196	-.29672E+07	-.26436E+07	.00000	.28051E+07	.00000	.00000
198	-.37757E+07	-.33613E+07	.00000	.35618E+07	.00000	.00000
200	-.46052E+07	-.41135E+07	.00000	.43554E+07	.00000	.00000
202	-.54755E+07	-.48963E+07	.00000	.51809E+07	.00000	.00000
204	-.63607E+07	-.56895E+07	.00000	.60172E+07	.00000	.00000
206	-.72676E+07	-.64855E+07	.00000	.68680E+07	.00000	.00000
208	-.81758E+07	-.72915E+07	.00000	.77210E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
210	-.90862E+07	-.81003E+07	.00000	.85795E+07	.00000	.00000
212	-.99988E+07	-.89082E+07	.00000	.94385E+07	.00000	.00000
214	-.10914E+08	-.97190E+07	.00000	.10300E+08	.00000	.00000
216	-.11831E+08	-.10539E+08	.00000	.11167E+08	.00000	.00000
218	-.12752E+08	-.11362E+08	.00000	.12037E+08	.00000	.00000
220	-.13700E+08	-.12182E+08	.00000	.12924E+08	.00000	.00000
222	-.14656E+08	-.13034E+08	.00000	.13826E+08	.00000	.00000
224	-.15650E+08	-.13910E+08	.00000	.14762E+08	.00000	.00000
226	-.16698E+08	-.14835E+08	.00000	.15749E+08	.00000	.00000
228	-.17827E+08	-.15832E+08	.00000	.16814E+08	.00000	.00000
230	-.19069E+08	-.16912E+08	.00000	.17987E+08	.00000	.00000
232	-.20480E+08	-.18220E+08	.00000	.19303E+08	.00000	.00000
234	-.22077E+08	-.19772E+08	.00000	.20910E+08	.00000	.00000
236	-.23990E+08	-.21488E+08	.00000	.22742E+08	.00000	.00000
238	-.26146E+08	-.23433E+08	.00000	.24749E+08	.00000	.00000
240	-.28374E+08	-.25425E+08	.00000	.26821E+08	.00000	.00000
242	-.30371E+08	-.27182E+08	.00000	.28631E+08	.00000	.00000
244	-.31663E+08	-.28239E+08	.00000	.29732E+08	.00000	.00000
246	-.31773E+08	-.28177E+08	.00000	.29740E+08	.00000	.00000
248	-.30615E+08	-.26993E+08	.00000	.28625E+08	.00000	.00000
250	-.28406E+08	-.24953E+08	.00000	.26583E+08	.00000	.00000
252	-.25725E+08	-.22665E+08	.00000	.24155E+08	.00000	.00000
254	-.23071E+08	-.20408E+08	.00000	.21697E+08	.00000	.00000
256	-.20739E+08	-.18296E+08	.00000	.19495E+08	.00000	.00000

258	-.18550E+08	-.16376E+08	.00000	.17484E+08	.00000	.00000
260	-.16634E+08	-.14322E+08	.00000	.15409E+08	.00000	.00000
262	-.14310E+08	-.12738E+08	.00000	.13468E+08	.00000	.00000
264	-.12198E+08	-.10711E+08	.00000	.11421E+08	.00000	.00000
266	-.98713E+07	-.86423E+07	.00000	.92278E+07	.00000	.00000
268	-.74129E+07	-.64393E+07	.00000	.69125E+07	.00000	.00000
270	-.48733E+07	-.43363E+07	.00000	.46013E+07	.00000	.00000
272	-.25885E+07	-.22044E+07	.00000	.24221E+07	.00000	.00000
274	-.56073E+06	-.47771E+06	.00000	.56074E+06	.00000	.00000
276	.87701E+06	.69827E+06	.00000	-.65854E+06	.00000	.00000
278	.14648E+07	.12189E+07	.00000	-.11925E+07	.00000	.00000
280	.15151E+07	.12881E+07	.00000	-.13317E+07	.00000	.00000
282	.11239E+07	.97510E+06	.00000	-.10350E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
284	.72677E+06	.32613E+06	.00000	-.52791E+06	.00000	.00000
286	.11964E+06	59851.	.00000	-99162.	.00000	.00000
289	.10106E+06	71376.	.00000	97246.	.00000	.00000
291	.44313E+06	.53685E+06	.00000	.48949E+06	.00000	.00000
293	.95857E+06	.83586E+06	.00000	.82521E+06	.00000	.00000
295	.10679E+07	.10007E+07	.00000	.10172E+07	.00000	.00000
297	.91418E+06	.10138E+07	.00000	.95217E+06	.00000	.00000
299	.57721E+06	.71655E+06	.00000	.64342E+06	.00000	.00000
301	.20388E+06	.29761E+06	.00000	.24611E+06	.00000	.00000
303	-.19351E+06	-.14191E+06	.00000	-.17205E+06	.00000	.00000
305	-.57870E+06	-.61557E+06	.00000	-.59354E+06	.00000	.00000
307	-.91277E+06	-.10086E+07	.00000	-.94764E+06	.00000	.00000
309	-.10149E+07	-.11622E+07	.00000	-.10719E+07	.00000	.00000
311	-.82754E+06	-.10079E+07	.00000	-.89218E+06	.00000	.00000
313	-.45422E+06	-.59117E+06	.00000	-.51235E+06	.00000	.00000
315	-77062.	-.13125E+06	.00000	-.11492E+06	.00000	.00000
318	-.33892E+08	.19433E+08	.00000	-.12207E+08	.00000	.00000
320	-.27832E+08	.48668E+07	.00000	-.16337E+08	.00000	.00000
322	-.21102E+08	-.56035E+07	.00000	-.12829E+08	.00000	.00000
324	-.15694E+08	-.83060E+07	.00000	-.79322E+07	.00000	.00000
326	-.12208E+08	-.64309E+07	.00000	-.49735E+07	.00000	.00000
329	-.53804E+07	-.18915E+07	.00000	-.36595E+07	.00000	.00000
331	-.22303E+07	-.12488E+07	.00000	-.30774E+07	.00000	.00000
333	-.20173E+06	-.93025E+06	.00000	-.20682E+07	.00000	.00000
335	.58230E+06	-.56125E+06	.00000	-.10487E+07	.00000	.00000
337	.52062E+06	-.25776E+06	.00000	-.33753E+06	.00000	.00000
340	.20753E+06	-.50110E+06	.00000	.40842E+06	.00000	.00000
342	.42212E+06	-.52347E+06	.00000	.12287E+07	.00000	.00000
344	.71801E+06	.46731E+06	.00000	.24019E+07	.00000	.00000
346	.87609E+06	.28880E+07	.00000	.33510E+07	.00000	.00000
348	.14992E+07	.63939E+07	.00000	.37011E+07	.00000	.00000
351	.67511E+07	.13624E+08	.00000	.47663E+07	.00000	.00000
353	.88558E+07	.17294E+08	.00000	.83527E+07	.00000	.00000
355	.52554E+07	.22776E+08	.00000	.13478E+08	.00000	.00000
357	-.63055E+07	.30408E+08	.00000	.15798E+08	.00000	.00000
359	-.22037E+08	.35901E+08	.00000	.10357E+08	.00000	.00000
362	.28448E+08	-.57516E+06	.00000	.37701E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
364	.23326E+08	.18251E+08	.00000	.73188E+07	.00000	.00000
366	.21628E+08	.28876E+08	.00000	.10678E+07	.00000	.00000
368	.25493E+08	.23262E+08	.00000	-.52462E+07	.00000	.00000
370	.29778E+08	.98129E+07	.00000	-.28530E+07	.00000	.00000
373	.13142E+08	-.72059E+07	.00000	.19184E+08	.00000	.00000
375	-.61526E+07	-.37206E+07	.00000	.25979E+08	.00000	.00000
377	-.24531E+08	.33011E+07	.00000	.23788E+08	.00000	.00000
379	-.35353E+08	.84800E+07	.00000	.13836E+08	.00000	.00000
381	-.36694E+08	.81018E+07	.00000	.43462E+07	.00000	.00000
384	-.25899E+08	.98816E+07	.00000	.10660E+07	.00000	.00000
386	-.23413E+08	.17289E+08	.00000	-1697.8	.00000	.00000
388	-.22498E+08	.26038E+08	.00000	-.41896E+07	.00000	.00000
390	-.19437E+08	.30951E+08	.00000	-.12744E+08	.00000	.00000
392	-.13025E+08	.28837E+08	.00000	-.20981E+08	.00000	.00000
395	-.23829E+07	.11574E+08	.00000	-.23916E+08	.00000	.00000
397	-.37549E+07	.31597E+07	.00000	-.23584E+08	.00000	.00000
399	-.47817E+07	-.39492E+07	.00000	-.24635E+08	.00000	.00000
401	.13088E+06	-.11928E+08	.00000	-.24918E+08	.00000	.00000
403	.11975E+08	-.16496E+08	.00000	-.17765E+08	.00000	.00000
406	-.18088E+08	-.15925E+08	.00000	-.10270E+07	.00000	.00000

408	-.14794E+08	-.17134E+08	.00000	.29281E+07	.00000	.00000
410	-.14108E+08	-.63907E+07	.00000	.36344E+07	.00000	.00000
412	-.14808E+08	.75344E+07	.00000	.27441E+07	.00000	.00000
414	-.10794E+08	.19252E+08	.00000	-.49177E+07	.00000	.00000
417	.11477E+08	.19860E+08	.00000	-.22229E+08	.00000	.00000
419	.23560E+08	.11510E+08	.00000	-.20524E+08	.00000	.00000
421	.28238E+08	.63105E+07	.00000	-.14277E+08	.00000	.00000
423	.24002E+08	.32787E+07	.00000	-.85812E+07	.00000	.00000
425	.14450E+08	.80007E+06	.00000	-.74207E+07	.00000	.00000
428	.86160E+07	-.10000E+08	.00000	-.11111E+08	.00000	.00000
430	.98960E+07	-.11247E+08	.00000	-.85797E+07	.00000	.00000
432	.13272E+08	-.62208E+07	.00000	-.63322E+07	.00000	.00000
434	.17817E+08	.18750E+07	.00000	-.75261E+07	.00000	.00000
436	.25005E+08	.63501E+07	.00000	-.11447E+08	.00000	.00000
439	.41143E+08	-.25603E+07	.00000	-.75892E+07	.00000	.00000
441	.39168E+08	-.71891E+07	.00000	.34651E+07	.00000	.00000
443	.25719E+08	-.67181E+07	.00000	.14392E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
445	.41294E+07	-.18363E+07	.00000	.16038E+08	.00000	.00000
447	-.12949E+08	-.25122E+07	.00000	.77413E+07	.00000	.00000
449	-6126.5	2301.4	.00000	-.13529E+06	.00000	.00000
450	-.65143E+06	.21550E+06	.00000	-.61762E+06	.00000	.00000
451	-.12828E+07	-54729.	.00000	-.85766E+06	.00000	.00000
452	-.19916E+07	-.64332E+06	.00000	-.11268E+07	.00000	.00000
453	-.30075E+07	-.15265E+07	.00000	-.16101E+07	.00000	.00000
454	-.40026E+07	-.26028E+07	.00000	-.18900E+07	.00000	.00000
455	-.59297E+07	-.37016E+07	.00000	-.32800E+07	.00000	.00000
456	-.12356E+08	-.18414E+07	.00000	-.66209E+07	.00000	.00000
457	-.23669E+08	.65739E+07	.00000	-.71328E+07	.00000	.00000
458	-.25612E+08	.10567E+08	.00000	-.58830E+07	.00000	.00000
459	-.23230E+08	.24727E+08	.00000	-.35336E+06	.00000	.00000
460	-.16786E+08	.20747E+08	.00000	.18121E+06	.00000	.00000
461	-.13765E+08	.25147E+08	.00000	.27354E+07	.00000	.00000
462	-.96068E+07	.25421E+08	.00000	.43449E+07	.00000	.00000
463	-.61626E+07	.23531E+08	.00000	.55514E+07	.00000	.00000
464	.18502E+07	.18597E+08	.00000	.81554E+07	.00000	.00000
465	.39274E+07	.84821E+07	.00000	.41903E+07	.00000	.00000
466	.26021E+07	.51431E+07	.00000	.23352E+07	.00000	.00000
467	.42176E+06	.20951E+07	.00000	.13583E+07	.00000	.00000
468	-14925.	.13766E+07	.00000	.10589E+07	.00000	.00000
469	-.29638E+06	.77432E+06	.00000	.68440E+06	.00000	.00000
470	-.28655E+08	.10946E+08	.00000	.47996E+07	.00000	.00000
471	-.23792E+08	.25007E+07	.00000	.12551E+08	.00000	.00000
472	-.18298E+08	.94044E+06	.00000	.15599E+08	.00000	.00000
473	-.11393E+08	.17201E+07	.00000	.10880E+08	.00000	.00000
474	.17609E+07	.11831E+07	.00000	.14271E+08	.00000	.00000
475	-.26913E+08	.14452E+08	.00000	.15545E+07	.00000	.00000
476	.99484E+07	.42696E+07	.00000	.11863E+08	.00000	.00000
477	.23762E+08	.88341E+07	.00000	.59778E+07	.00000	.00000
478	.24665E+08	.73838E+07	.00000	-.19647E+07	.00000	.00000
479	.20349E+08	.31564E+07	.00000	-.57221E+07	.00000	.00000
480	.20322E+08	.34473E+07	.00000	-.42649E+07	.00000	.00000
481	.11924E+08	-.24453E+07	.00000	-.91383E+07	.00000	.00000
482	.10241E+08	-.66056E+07	.00000	-.13343E+08	.00000	.00000
483	.69295E+07	-.73430E+07	.00000	-.18259E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
484	.15689E+07	.38827E+07	.00000	-.25235E+08	.00000	.00000
485	-.62002E+07	.22414E+08	.00000	-.20851E+08	.00000	.00000
486	-.10926E+08	.25092E+08	.00000	-.16916E+08	.00000	.00000
487	-.15646E+08	.25381E+08	.00000	-.12486E+08	.00000	.00000
488	-.20588E+08	.23549E+08	.00000	-.75223E+07	.00000	.00000
489	-.24146E+08	.19725E+08	.00000	-.24702E+07	.00000	.00000
490	.14808E+08	-.44130E+07	.00000	-.92804E+07	.00000	.00000
491	.16840E+08	.22382E+06	.00000	-.10893E+08	.00000	.00000
492	.11116E+08	-.58394E+07	.00000	-.84985E+07	.00000	.00000
493	.14831E+08	.52083E+07	.00000	-.13042E+08	.00000	.00000
494	.17281E+08	.93827E+07	.00000	-.13914E+08	.00000	.00000
495	.83365E+07	.14189E+08	.00000	-.12177E+08	.00000	.00000
496	-.40664E+07	.74063E+07	.00000	-.66595E+07	.00000	.00000
497	-.11514E+08	.35346E+07	.00000	-.35719E+07	.00000	.00000
498	-.14490E+08	.20705E+07	.00000	.85064E+06	.00000	.00000
499	-.12085E+08	-.23805E+07	.00000	.62939E+07	.00000	.00000

500	.88664E+06	-.32263E+07	.00000	.74391E+07	.00000	.00000
501	.43826E+07	-.95889E+07	.00000	.61845E+07	.00000	.00000
502	.12999E+08	-.55464E+07	.00000	.43018E+07	.00000	.00000
503	.21728E+08	-.13350E+07	.00000	.21662E+07	.00000	.00000
504	.24724E+08	.10728E+07	.00000	-.83597E+06	.00000	.00000
505	.26802E+08	.20778E+06	.00000	-.25624E+07	.00000	.00000
506	.23968E+08	-.52805E+06	.00000	-.87733E+07	.00000	.00000
507	.23484E+08	-.28753E+07	.00000	-.80341E+07	.00000	.00000
508	.20151E+08	-.18458E+07	.00000	-.95359E+07	.00000	.00000
509	.11726E+08	-.51778E+07	.00000	-.93311E+07	.00000	.00000
510	-.45255E+06	.40967E+06	.00000	-.10290E+06	.00000	.00000
511	-.77250E+06	.51842E+06	.00000	-.20793E+06	.00000	.00000
512	-.60213E+06	.63211E+06	.00000	-18023.	.00000	.00000
513	-.64466E+06	.66331E+06	.00000	-7290.5	.00000	.00000
514	-.65267E+06	.64601E+06	.00000	86991.	.00000	.00000
515	-.40208E+06	.52223E+06	.00000	.26019E+06	.00000	.00000
516	-.63036E+06	.69097E+06	.00000	65002.	.00000	.00000
517	-.43829E+06	.60959E+06	.00000	60980.	.00000	.00000
518	-.16584E+07	-.27981E+06	.00000	-.24769E+06	.00000	.00000
519	-.21788E+07	-.98678E+06	.00000	-.50445E+06	.00000	.00000
520	-.89676E+06	.48467E+06	.00000	-19918.	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
521	-.99822E+06	-49223.	.00000	.16247E+06	.00000	.00000
522	-.30238E+07	-.18947E+07	.00000	-.10955E+07	.00000	.00000
523	-.45707E+07	-.27574E+07	.00000	-.22750E+07	.00000	.00000
524	-.20137E+08	.57199E+07	.00000	-.50324E+07	.00000	.00000
525	-.17310E+08	.17814E+07	.00000	-.67506E+07	.00000	.00000
526	-.22818E+08	.90942E+07	.00000	-.39114E+07	.00000	.00000
527	-.97905E+07	-86094.	.00000	-.41386E+07	.00000	.00000
528	-.23483E+08	.15566E+08	.00000	-.28155E+07	.00000	.00000
529	-.18090E+08	.16466E+08	.00000	-.46793E+06	.00000	.00000
530	-.22110E+08	.10909E+08	.00000	-.19526E+07	.00000	.00000
531	-.19814E+08	.12142E+08	.00000	-.16741E+06	.00000	.00000
532	-.17791E+08	.13686E+08	.00000	.12055E+06	.00000	.00000
533	-.15900E+08	.14826E+08	.00000	-76641.	.00000	.00000
534	-.15324E+08	.16367E+08	.00000	-.36269E+06	.00000	.00000
535	-.20713E+08	.10206E+08	.00000	-.87352E+06	.00000	.00000
536	-.19634E+08	.11080E+08	.00000	.41346E+06	.00000	.00000
537	-.17593E+08	.12285E+08	.00000	.11359E+07	.00000	.00000
538	-.16358E+08	.13324E+08	.00000	.61698E+06	.00000	.00000
539	-.14919E+08	.14527E+08	.00000	-17320.	.00000	.00000
540	-.14144E+08	.18787E+08	.00000	-.52069E+06	.00000	.00000
541	-.12559E+08	.21491E+08	.00000	11025.	.00000	.00000
542	-.88746E+07	.22168E+08	.00000	.18677E+07	.00000	.00000
543	-.10672E+08	.22878E+08	.00000	.10377E+07	.00000	.00000
544	-.11190E+08	.20539E+08	.00000	-.10845E+07	.00000	.00000
545	-.10300E+08	.20566E+08	.00000	-.10205E+07	.00000	.00000
546	-.30314E+07	.19428E+08	.00000	.61785E+07	.00000	.00000
547	.61431E+06	.13668E+08	.00000	.59441E+07	.00000	.00000
548	.13715E+07	.28916E+07	.00000	.77861E+06	.00000	.00000
549	.52198E+06	.22449E+07	.00000	.62457E+06	.00000	.00000
550	.23310E+07	.40900E+07	.00000	.16027E+07	.00000	.00000
551	.14370E+07	.22884E+07	.00000	.42933E+06	.00000	.00000
552	-.29523E+06	.13073E+07	.00000	.51048E+06	.00000	.00000
553	-.53805E+06	.89098E+06	.00000	.30413E+06	.00000	.00000
554	-96872.	.15983E+07	.00000	.29328E+06	.00000	.00000
555	-.28881E+06	.12589E+07	.00000	2038.7	.00000	.00000
556	.37731E+06	.18532E+07	.00000	.17777E+06	.00000	.00000
557	-.23577E+08	.92806E+07	.00000	.76972E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
558	-.21751E+08	.35745E+07	.00000	.10163E+08	.00000	.00000
559	.25216E+07	.80806E+07	.00000	.40311E+07	.00000	.00000
560	-.25199E+08	.13785E+08	.00000	.43218E+07	.00000	.00000
561	-.20729E+08	.84862E+07	.00000	.76066E+07	.00000	.00000
562	-.19762E+08	.46680E+07	.00000	.90997E+07	.00000	.00000
563	-.18599E+08	.29293E+07	.00000	.91168E+07	.00000	.00000
564	-.16895E+08	.48247E+06	.00000	.10357E+08	.00000	.00000
565	-.14590E+08	.34203E+06	.00000	.10556E+08	.00000	.00000
566	-.71929E+07	.34468E+07	.00000	.11971E+08	.00000	.00000
567	-.19953E+07	.40338E+07	.00000	.13365E+08	.00000	.00000
568	-.24495E+08	.17146E+08	.00000	.55479E+06	.00000	.00000
569	.60861E+07	.27967E+07	.00000	.13634E+08	.00000	.00000

570	.10016E+08	-.69226E+07	.00000	.36215E+07	.00000	.00000
571	.25779E+06	-.65705E+06	.00000	-14713.	.00000	.00000
572	.56856E+06	-.83545E+06	.00000	.22193E+06	.00000	.00000
573	.81816E+06	-.50724E+06	.00000	-23955.	.00000	.00000
574	.24376E+06	-.29776E+06	.00000	.37970E+06	.00000	.00000
575	-.37909E+06	.16067E+07	.00000	.13476E+06	.00000	.00000
576	-.12504E+07	.49084E+07	.00000	-.61024E+06	.00000	.00000
577	-.86525E+06	.44795E+07	.00000	-.15496E+07	.00000	.00000
578	-.43122E+06	.71254E+07	.00000	-.32310E+07	.00000	.00000
579	.65877E+06	.10098E+08	.00000	-.54714E+07	.00000	.00000
580	.32224E+07	.12296E+08	.00000	-.79825E+07	.00000	.00000
581	.58974E+07	.14388E+08	.00000	-.10407E+08	.00000	.00000
582	.82030E+07	.16611E+08	.00000	-.12675E+08	.00000	.00000
583	.10219E+08	.18953E+08	.00000	-.14860E+08	.00000	.00000
584	.15100E+08	.23426E+08	.00000	-.19579E+08	.00000	.00000
585	.22194E+08	.26989E+08	.00000	-.24903E+08	.00000	.00000
586	.23807E+08	.28260E+08	.00000	-.26426E+08	.00000	.00000
587	.25159E+08	.28981E+08	.00000	-.27611E+08	.00000	.00000
588	.29665E+08	.28824E+08	.00000	-.29866E+08	.00000	.00000
589	.31124E+08	.27636E+08	.00000	-.29933E+08	.00000	.00000
590	.31391E+08	.25346E+08	.00000	-.28771E+08	.00000	.00000
591	.32545E+08	.25553E+08	.00000	-.29057E+08	.00000	.00000
592	.32173E+08	.24912E+08	.00000	-.28422E+08	.00000	.00000
593	.31587E+08	.24455E+08	.00000	-.27833E+08	.00000	.00000
594	.30813E+08	.24003E+08	.00000	-.27213E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
595	.29782E+08	.23153E+08	.00000	-.26277E+08	.00000	.00000
596	.28253E+08	.21233E+08	.00000	-.24536E+08	.00000	.00000
597	.27800E+08	.21721E+08	.00000	-.24618E+08	.00000	.00000
598	.27129E+08	.21498E+08	.00000	-.24184E+08	.00000	.00000
599	.26262E+08	.20925E+08	.00000	-.23472E+08	.00000	.00000
600	.25116E+08	.18677E+08	.00000	-.21742E+08	.00000	.00000
601	.25106E+08	.19747E+08	.00000	-.22303E+08	.00000	.00000
602	.23501E+08	.18073E+08	.00000	-.20664E+08	.00000	.00000
603	.21838E+08	.16492E+08	.00000	-.19042E+08	.00000	.00000
604	.20935E+08	.15627E+08	.00000	-.18161E+08	.00000	.00000
605	.20188E+08	.14912E+08	.00000	-.17428E+08	.00000	.00000
606	.19413E+08	.14151E+08	.00000	-.16662E+08	.00000	.00000
607	.18672E+08	.13592E+08	.00000	-.16019E+08	.00000	.00000
608	.17870E+08	.13005E+08	.00000	-.15332E+08	.00000	.00000
609	.17027E+08	.12268E+08	.00000	-.14547E+08	.00000	.00000
610	.16189E+08	.11398E+08	.00000	-.13698E+08	.00000	.00000
611	.15364E+08	.10456E+08	.00000	-.12818E+08	.00000	.00000
612	.13660E+08	.89970E+07	.00000	-.11257E+08	.00000	.00000
613	.12774E+08	.82138E+07	.00000	-.10437E+08	.00000	.00000
614	.11809E+08	.72502E+07	.00000	-.94762E+07	.00000	.00000
615	.11996E+08	.47658E+07	.00000	-.84302E+07	.00000	.00000
616	.10684E+08	.60275E+07	.00000	-.83123E+07	.00000	.00000
617	.86362E+07	.43103E+06	.00000	-.42974E+07	.00000	.00000
618	.75102E+07	-.77479E+06	.00000	-.26238E+07	.00000	.00000
619	.38778E+07	-.51381E+06	.00000	-.10893E+07	.00000	.00000
620	.20281E+07	-.29870E+06	.00000	-.33453E+06	.00000	.00000
621	.75579E+06	.21777E+06	.00000	-21512.	.00000	.00000
622	-.29052E+06	.76034E+06	.00000	69994.	.00000	.00000
623	.17154E+07	.27619E+06	.00000	-58351.	.00000	.00000
624	.21597E+07	-.48922E+06	.00000	.26141E+06	.00000	.00000
625	.28834E+07	-.78042E+06	.00000	.64043E+06	.00000	.00000
626	.87743E+07	-.16685E+07	.00000	.34702E+07	.00000	.00000
627	.91908E+07	-.96050E+06	.00000	.57258E+07	.00000	.00000
628	.44862E+07	.37561E+07	.00000	.70740E+07	.00000	.00000
629	-.30154E+07	.78180E+07	.00000	.45098E+07	.00000	.00000
630	-.29326E+07	.88860E+07	.00000	.22349E+07	.00000	.00000
631	-.22299E+07	.67183E+07	.00000	.92729E+06	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
632	-.26178E+06	.15338E+07	.00000	58318.	.00000	.00000
633	2713.4	.84547E+06	.00000	-.42404E+06	.00000	.00000
634	.99046E+06	.34354E+06	.00000	.13864E+06	.00000	.00000
635	.16311E+08	.26886E+08	.00000	-.22411E+08	.00000	.00000
636	.89214E+07	.26351E+08	.00000	-.19519E+08	.00000	.00000
637	.22710E+08	.17350E+08	.00000	-.19912E+08	.00000	.00000
638	.21852E+08	.14329E+08	.00000	-.17915E+08	.00000	.00000
639	.10736E+08	.26055E+08	.00000	-.19404E+08	.00000	.00000

640	.22543E+08	.14938E+08	.00000	-.18557E+08	.00000	.00000
641	.94814E+07	.23970E+07	.00000	-.58758E+07	.00000	.00000
642	.12306E+08	.63270E+06	.00000	-.67589E+07	.00000	.00000
643	.12509E+08	.27845E+07	.00000	-.78868E+07	.00000	.00000
644	.99828E+06	.42441E+06	.00000	-.86357E+06	.00000	.00000
645	.12000E+07	.32084E+06	.00000	-.73397E+06	.00000	.00000
646	.12875E+07	.56572E+06	.00000	-.76038E+06	.00000	.00000
647	.14484E+07	.12206E+07	.00000	-.11035E+07	.00000	.00000
648	.24472E+07	.23488E+07	.00000	-.23993E+07	.00000	.00000
649	.92812E+06	.87630E+06	.00000	-.97160E+06	.00000	.00000
650	.14181E+07	18492.	.00000	-.94395E+06	.00000	.00000
651	.83440E+06	-.65294E+06	.00000	-.18444E+06	.00000	.00000
652	.38408E+06	-.12887E+07	.00000	.41913E+06	.00000	.00000
653	-.14464E+06	-.19301E+07	.00000	.10418E+07	.00000	.00000
654	-.90243E+06	-.25593E+07	.00000	.17567E+07	.00000	.00000
655	-.19504E+07	-.29542E+07	.00000	.24779E+07	.00000	.00000
656	-.20948E+07	-.42269E+07	.00000	.32212E+07	.00000	.00000
657	-.31207E+07	-.56936E+07	.00000	.44862E+07	.00000	.00000
658	-.41216E+07	-.64353E+07	.00000	.53565E+07	.00000	.00000
659	-.50357E+07	-.71880E+07	.00000	.61881E+07	.00000	.00000
660	-.58482E+07	-.79514E+07	.00000	.69761E+07	.00000	.00000
661	-.67229E+07	-.87121E+07	.00000	.77922E+07	.00000	.00000
662	-.75988E+07	-.94872E+07	.00000	.86157E+07	.00000	.00000
663	-.82440E+07	-.10222E+08	.00000	.93057E+07	.00000	.00000
664	-.89726E+07	-.11043E+08	.00000	.10081E+08	.00000	.00000
665	-.10203E+08	-.11979E+08	.00000	.11152E+08	.00000	.00000
666	-.11259E+08	-.12892E+08	.00000	.12127E+08	.00000	.00000
667	-.12161E+08	-.13810E+08	.00000	.13026E+08	.00000	.00000
668	-.13090E+08	-.14822E+08	.00000	.13987E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
669	-.14158E+08	-.15941E+08	.00000	.15070E+08	.00000	.00000
670	-.15649E+08	-.17145E+08	.00000	.16397E+08	.00000	.00000
671	-.14952E+08	-.19010E+08	.00000	.16950E+08	.00000	.00000
672	-.16197E+08	-.20874E+08	.00000	.18550E+08	.00000	.00000
673	-.17754E+08	-.22354E+08	.00000	.20209E+08	.00000	.00000
674	-.19433E+08	-.23321E+08	.00000	.21729E+08	.00000	.00000
675	-.20912E+08	-.23280E+08	.00000	.22766E+08	.00000	.00000
676	-.22717E+08	-.21931E+08	.00000	.23279E+08	.00000	.00000
677	-.24582E+08	-.19647E+08	.00000	.23075E+08	.00000	.00000
678	-.26207E+08	-.17687E+08	.00000	.22422E+08	.00000	.00000
679	-.26261E+08	-.15971E+08	.00000	.21082E+08	.00000	.00000
680	-.24910E+08	-.15504E+08	.00000	.19933E+08	.00000	.00000
681	-.22879E+08	-.11352E+08	.00000	.16589E+08	.00000	.00000
682	-.20166E+08	-.10554E+08	.00000	.15015E+08	.00000	.00000
683	-.18984E+08	-.65729E+07	.00000	.12438E+08	.00000	.00000
684	-.17290E+08	-.53868E+07	.00000	.11150E+08	.00000	.00000
685	-.15732E+08	-.61709E+07	.00000	.10789E+08	.00000	.00000
686	-.14171E+08	-.50807E+07	.00000	.94691E+07	.00000	.00000
687	-.97070E+07	-.19428E+07	.00000	.56248E+07	.00000	.00000
688	-.51907E+07	.92574E+06	.00000	.15890E+07	.00000	.00000
689	-.34796E+07	.10842E+07	.00000	.42610E+06	.00000	.00000
690	-.17552E+07	.37556E+06	.00000	-.21861E+06	.00000	.00000
691	.33416E+06	-39598.	.00000	-.42405E+06	.00000	.00000
692	.84081E+06	-.52006E+06	.00000	-.20794E+06	.00000	.00000
693	.85638E+06	-.54060E+06	.00000	79539.	.00000	.00000
694	.75898E+06	-.20542E+06	.00000	.37381E+06	.00000	.00000
695	-.60849E+06	.36333E+06	.00000	.23273E+06	.00000	.00000
696	-.29917E+06	.72579E+06	.00000	.28137E+06	.00000	.00000
697	-.32628E+06	.75191E+06	.00000	.20250E+06	.00000	.00000
698	.51630E+06	.94644E+06	.00000	-.10771E+07	.00000	.00000
699	-.25410E+07	-.49366E+07	.00000	.38077E+07	.00000	.00000
700	.25534E+06	-.47586E+07	.00000	.23506E+07	.00000	.00000
701	-.58018E+07	-.17432E+08	.00000	.13771E+08	.00000	.00000
702	.46440E+06	-.40759E+07	.00000	.18674E+07	.00000	.00000
703	-.92243E+07	-.19053E+08	.00000	.14025E+08	.00000	.00000
704	-.68480E+07	-.15099E+06	.00000	.31404E+07	.00000	.00000
705	-.14237E+08	.50988E+07	.00000	.26336E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
706	-.11250E+08	.19824E+07	.00000	.38555E+07	.00000	.00000
707	.29353E+06	-.54809E+06	.00000	.33536E+06	.00000	.00000
708	84166.	-.16194E+06	.00000	.41880E+06	.00000	.00000
709	-.64887E+06	.45496E+06	.00000	-.11385E+06	.00000	.00000

710	-.60395E+06	.32171E+06	.00000	-.37536E+06	.00000	.00000
711	-.26088E+06	.11376E+06	.00000	-.43723E+06	.00000	.00000
712	.26522E+06	-.10460E+06	.00000	-.37200E+06	.00000	.00000
713	.39264E+06	-.62002E+06	.00000	-.31646E+06	.00000	.00000
714	.27376E+06	-.83788E+06	.00000	-.27529E+06	.00000	.00000
715	.20876E+08	54236.	.00000	.43051E+07	.00000	.00000
716	.14844E+08	.69024E+06	.00000	.10680E+08	.00000	.00000
717	.13357E+08	-.56039E+07	.00000	.76670E+07	.00000	.00000
718	.21400E+08	.12709E+07	.00000	-.18157E+07	.00000	.00000
719	.15879E+08	.35211E+07	.00000	-.67492E+07	.00000	.00000
720	.10826E+08	.22534E+07	.00000	-.81086E+07	.00000	.00000
721	.18130E+08	.14994E+07	.00000	-.46569E+07	.00000	.00000
722	.14864E+08	.17305E+07	.00000	-.69842E+07	.00000	.00000
723	.11795E+08	.26636E+07	.00000	-.79882E+07	.00000	.00000
724	.99176E+07	.30691E+07	.00000	-.82354E+07	.00000	.00000
725	.10045E+08	.15779E+07	.00000	-.87093E+07	.00000	.00000
726	.16419E+08	-.15940E+07	.00000	-.36741E+07	.00000	.00000
727	.13534E+08	-.17424E+07	.00000	-.52393E+07	.00000	.00000
728	.10787E+08	.12249E+07	.00000	-.74501E+07	.00000	.00000
729	.95906E+07	.24851E+07	.00000	-.78956E+07	.00000	.00000
730	.10472E+08	-.17866E+07	.00000	-.10349E+08	.00000	.00000
731	.10651E+08	-.10866E+07	.00000	-.11100E+08	.00000	.00000
732	.91171E+07	-.14047E+07	.00000	-.19588E+08	.00000	.00000
733	.76111E+07	.43633E+07	.00000	-.22803E+08	.00000	.00000
734	.10038E+08	-.36775E+07	.00000	-.15686E+08	.00000	.00000
735	.12358E+08	.12685E+07	.00000	-.17076E+08	.00000	.00000
736	.11860E+08	-.33897E+06	.00000	-.13534E+08	.00000	.00000
737	.14619E+08	.40501E+07	.00000	-.15737E+08	.00000	.00000
738	.68048E+07	.12465E+08	.00000	-.23592E+08	.00000	.00000
739	-.12995E+07	.16017E+08	.00000	-.24407E+08	.00000	.00000
740	-.14955E+07	.22730E+08	.00000	-.18490E+08	.00000	.00000
741	-.65039E+07	.23524E+08	.00000	-.15700E+08	.00000	.00000
742	-.11079E+08	.23577E+08	.00000	-.12871E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
743	-.21468E+08	.20678E+08	.00000	-.42649E+07	.00000	.00000
744	-.16573E+08	.22931E+08	.00000	-.90173E+07	.00000	.00000
745	-.13542E+08	.23090E+08	.00000	-.98170E+07	.00000	.00000
746	-.18838E+08	.21369E+08	.00000	-.51347E+07	.00000	.00000
747	-.21564E+08	.18780E+08	.00000	-.76840E+06	.00000	.00000
748	-.22105E+08	.15982E+08	.00000	.25585E+07	.00000	.00000
749	-.21436E+08	.13560E+08	.00000	.46532E+07	.00000	.00000
750	-.20291E+08	.11693E+08	.00000	.56671E+07	.00000	.00000
751	-.19374E+08	.79312E+07	.00000	.73795E+07	.00000	.00000
752	-.18645E+08	.51647E+07	.00000	.82103E+07	.00000	.00000
753	-.17932E+08	.28369E+07	.00000	.85921E+07	.00000	.00000
754	-.17229E+08	.12780E+07	.00000	.87093E+07	.00000	.00000
755	-.16600E+08	.46150E+06	.00000	.88114E+07	.00000	.00000
756	-.15662E+08	.56353E+06	.00000	.89259E+07	.00000	.00000
757	-.14988E+08	.13476E+07	.00000	.97938E+07	.00000	.00000
758	-.13398E+08	.17904E+07	.00000	.11909E+08	.00000	.00000
759	.15543E+08	-.25994E+07	.00000	-.10161E+08	.00000	.00000
760	.16463E+08	.15562E+06	.00000	-.11904E+08	.00000	.00000
761	.14231E+08	-.39847E+07	.00000	-.80166E+07	.00000	.00000
762	.14655E+08	-.31634E+07	.00000	-.86104E+07	.00000	.00000
763	.14427E+08	-.97307E+06	.00000	-.10507E+08	.00000	.00000
764	.13579E+08	.14664E+07	.00000	-.11543E+08	.00000	.00000
765	.12030E+08	.42443E+07	.00000	-.11622E+08	.00000	.00000
766	.10523E+08	.89113E+07	.00000	-.11182E+08	.00000	.00000
767	.82576E+07	.10669E+08	.00000	-.88952E+07	.00000	.00000
768	.12804E+08	-.35747E+07	.00000	-.75746E+07	.00000	.00000
769	.63994E+07	.94258E+07	.00000	-.68357E+07	.00000	.00000
770	.43941E+07	.66357E+07	.00000	-.59583E+07	.00000	.00000
771	.14048E+07	.45343E+07	.00000	-.63194E+07	.00000	.00000
772	-.51441E+07	.48300E+07	.00000	-.62204E+07	.00000	.00000
773	-.85719E+07	.57371E+07	.00000	-.46178E+07	.00000	.00000
774	-.98669E+07	.67591E+07	.00000	-.28704E+06	.00000	.00000
775	-.76942E+07	.17417E+07	.00000	.55181E+07	.00000	.00000
776	.12452E+08	-.37614E+07	.00000	39300.	.00000	.00000
777	.14653E+08	.75205E+06	.00000	-16635.	.00000	.00000
778	.97555E+07	-.15287E+07	.00000	-.62114E+06	.00000	.00000
779	.17806E+08	.96834E+06	.00000	.22512E+06	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ

780	.20244E+08	-.18691E+07	.00000	-.17124E+07	.00000	.00000
781	.23598E+08	-.32790E+07	.00000	-.57354E+07	.00000	.00000
782	.20646E+08	-.35532E+07	.00000	-.92386E+07	.00000	.00000
783	.16522E+08	-.32880E+07	.00000	-.10404E+08	.00000	.00000
784	.13293E+08	-.32878E+07	.00000	-.97956E+07	.00000	.00000
785	.17059E+08	-.34410E+07	.00000	-.95834E+07	.00000	.00000
786	.14497E+08	-.26037E+07	.00000	-.96509E+07	.00000	.00000
787	.13342E+08	-.23670E+07	.00000	-.89818E+07	.00000	.00000
788	.12283E+08	-.31487E+07	.00000	-.83527E+07	.00000	.00000
789	.13852E+08	-.30578E+07	.00000	-.77965E+07	.00000	.00000
790	.13373E+08	-.29757E+07	.00000	-.77776E+07	.00000	.00000
791	.14146E+08	-.30141E+07	.00000	-.80512E+07	.00000	.00000
792	.14295E+08	-.20290E+07	.00000	-.94653E+07	.00000	.00000
793	.13481E+08	-.11284E+07	.00000	-.96660E+07	.00000	.00000
794	.12924E+08	9424.4	.00000	-.10212E+08	.00000	.00000
795	.11282E+08	.20573E+07	.00000	-.10297E+08	.00000	.00000
796	.99785E+07	.39543E+07	.00000	-.10127E+08	.00000	.00000
797	.83189E+07	.56098E+07	.00000	-.92136E+07	.00000	.00000
798	.66671E+07	.72868E+07	.00000	-.75979E+07	.00000	.00000
799	.57535E+07	.75242E+07	.00000	-.58698E+07	.00000	.00000
800	-.67520E+06	.79685E+06	.00000	44495.	.00000	.00000
801	-.13514E+07	-.59627E+06	.00000	51150.	.00000	.00000
802	-.57703E+06	-.33555E+06	.00000	.27761E+06	.00000	.00000
803	-.19475E+07	-.12980E+07	.00000	-.27603E+06	.00000	.00000
804	-.30084E+07	-.20288E+07	.00000	-.10724E+07	.00000	.00000
805	-.56721E+07	-.18006E+07	.00000	-.27019E+07	.00000	.00000
806	-.16958E+08	.58041E+07	.00000	-.27110E+07	.00000	.00000
807	-.21029E+08	.84496E+07	.00000	-.27937E+07	.00000	.00000
808	-.19488E+08	.96829E+07	.00000	.13186E+06	.00000	.00000
809	-.18370E+08	.11346E+08	.00000	.14160E+07	.00000	.00000
810	-.16602E+08	.12292E+08	.00000	.14997E+07	.00000	.00000
811	-.15470E+08	.13288E+08	.00000	.80328E+06	.00000	.00000
812	-.14179E+08	.14477E+08	.00000	-.10820E+06	.00000	.00000
813	-.13774E+08	.15952E+08	.00000	-.71357E+06	.00000	.00000
814	-.13047E+08	.17622E+08	.00000	-.11291E+07	.00000	.00000
815	-.12160E+08	.19406E+08	.00000	-.12276E+07	.00000	.00000
816	-.18694E+08	.81236E+07	.00000	-.91830E+06	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
817	-.18578E+08	.10527E+08	.00000	.15841E+07	.00000	.00000
818	-.67553E+07	.19440E+08	.00000	.24560E+07	.00000	.00000
819	-.95641E+07	.19751E+08	.00000	-.15285E+07	.00000	.00000
820	-.64285E+07	.16960E+08	.00000	.20673E+06	.00000	.00000
821	-.11958E+08	.18232E+08	.00000	-.18701E+07	.00000	.00000
822	-.10630E+08	.19347E+08	.00000	-.22967E+07	.00000	.00000
823	-.99790E+07	.19288E+08	.00000	-.25200E+07	.00000	.00000
824	-.12449E+08	.17305E+08	.00000	-.16207E+07	.00000	.00000
825	-.11321E+08	.19038E+08	.00000	-.21037E+07	.00000	.00000
826	-.10539E+08	.18561E+08	.00000	-.33185E+07	.00000	.00000
827	-.10180E+08	.18969E+08	.00000	-.29659E+07	.00000	.00000
828	.97850E+06	.20679E+07	.00000	.21219E+06	.00000	.00000
829	-.84690E+07	.18688E+08	.00000	-.19138E+07	.00000	.00000
830	.10310E+07	.14006E+07	.00000	22091.	.00000	.00000
831	.14243E+07	.47355E+07	.00000	.17061E+07	.00000	.00000
832	.27957E+06	.88043E+07	.00000	.31995E+07	.00000	.00000
833	-.13721E+08	.26971E+07	.00000	-.41849E+07	.00000	.00000
834	-.51356E+06	.11229E+07	.00000	.15643E+06	.00000	.00000
835	-.44417E+06	.82871E+06	.00000	-.20118E+06	.00000	.00000
836	-.60150E+06	-.74491E+06	.00000	.21540E+06	.00000	.00000
837	-.85865E+07	.11359E+07	.00000	-.22009E+07	.00000	.00000
838	.66085E+06	.12988E+07	.00000	-.10410E+06	.00000	.00000
839	.14523E+06	.13130E+07	.00000	-.11016E+06	.00000	.00000
840	-.37579E+07	.13229E+08	.00000	.14816E+07	.00000	.00000
841	-.14353E+07	.89808E+07	.00000	.15823E+07	.00000	.00000
842	41143.	.51580E+07	.00000	.10530E+07	.00000	.00000
843	-.30061E+07	-.20646E+07	.00000	.15357E+08	.00000	.00000
844	.51614E+07	-.48498E+07	.00000	.13244E+08	.00000	.00000
845	.17175E+08	-.39985E+07	.00000	.52919E+06	.00000	.00000
846	.97958E+07	.33621E+07	.00000	-.84831E+07	.00000	.00000
847	.97706E+07	.32098E+07	.00000	-.81454E+07	.00000	.00000
848	.13306E+08	-.67046E+07	.00000	.10553E+07	.00000	.00000
849	.10324E+08	-.37569E+07	.00000	-.43015E+07	.00000	.00000
850	.97208E+07	-.54496E+06	.00000	-.64413E+07	.00000	.00000
851	.94127E+07	.12570E+07	.00000	-.73080E+07	.00000	.00000
852	.10984E+08	.13546E+07	.00000	-.10030E+08	.00000	.00000
853	.13087E+08	.22970E+07	.00000	-.12502E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
854	.14272E+08	.44663E+07	.00000	-.12095E+08	.00000	.00000
855	.11991E+08	.47158E+07	.00000	-.20132E+08	.00000	.00000
856	.14661E+08	.55529E+07	.00000	-.18206E+08	.00000	.00000
857	.95171E+07	-.86006E+07	.00000	.91065E+06	.00000	.00000
858	.81201E+07	-.50304E+07	.00000	-.32510E+07	.00000	.00000
859	.87542E+07	-.13708E+07	.00000	-.58142E+07	.00000	.00000
860	.12573E+08	.10306E+08	.00000	-.22067E+08	.00000	.00000
861	.92011E+07	.10784E+07	.00000	-.71029E+07	.00000	.00000
862	.64722E+07	-.96920E+07	.00000	.96812E+07	.00000	.00000
863	-.94330E+07	.80402E+06	.00000	.14368E+08	.00000	.00000
864	.17538E+08	.74963E+07	.00000	-.16251E+08	.00000	.00000
865	.93742E+07	.18790E+08	.00000	-.22807E+08	.00000	.00000
866	.33702E+07	.21193E+08	.00000	-.20976E+08	.00000	.00000
867	-.24987E+07	.24005E+08	.00000	-.16103E+08	.00000	.00000
868	-.65710E+07	.23860E+08	.00000	-.13905E+08	.00000	.00000
869	-.11648E+08	.23254E+08	.00000	-.98805E+07	.00000	.00000
870	-.16314E+08	.21817E+08	.00000	-.58770E+07	.00000	.00000
871	-.97813E+07	.23508E+08	.00000	-.99160E+07	.00000	.00000
872	-.14235E+08	.22119E+08	.00000	-.63557E+07	.00000	.00000
873	-.16735E+08	.20464E+08	.00000	-.32453E+07	.00000	.00000
874	-.19285E+08	.19469E+08	.00000	-.16761E+07	.00000	.00000
875	-.19925E+08	.17328E+08	.00000	.10071E+07	.00000	.00000
876	-.19562E+08	.15548E+08	.00000	.26416E+07	.00000	.00000
877	-.17984E+08	.18628E+08	.00000	-.67339E+06	.00000	.00000
878	-.18099E+08	.17089E+08	.00000	.93536E+06	.00000	.00000
879	-.18820E+08	.13719E+08	.00000	.38483E+07	.00000	.00000
880	-.18829E+08	.10798E+08	.00000	.56363E+07	.00000	.00000
881	-.18542E+08	.80937E+07	.00000	.68373E+07	.00000	.00000
882	-.18107E+08	.54287E+07	.00000	.76228E+07	.00000	.00000
883	-.17724E+08	.31269E+07	.00000	.80555E+07	.00000	.00000
884	-.17476E+08	.13103E+07	.00000	.82498E+07	.00000	.00000
885	-.17367E+08	.29783E+06	.00000	.84125E+07	.00000	.00000
886	-.17522E+08	-78346.	.00000	.89381E+07	.00000	.00000
887	.50771E+07	.61163E+07	.00000	-.45042E+07	.00000	.00000
888	.18063E+08	.21002E+08	.00000	-.24292E+08	.00000	.00000
889	.42029E+07	.41682E+07	.00000	-.41155E+07	.00000	.00000
890	.15162E+08	.16311E+08	.00000	-.23140E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
891	-.23241E+07	.44919E+07	.00000	-.58233E+07	.00000	.00000
892	-.55080E+07	.62083E+07	.00000	-.40471E+07	.00000	.00000
893	-.60538E+07	.76835E+07	.00000	-.12599E+07	.00000	.00000
894	.24121E+07	.28518E+07	.00000	-.43125E+07	.00000	.00000
895	.98148E+07	-.35445E+07	.00000	.10168E+07	.00000	.00000
896	-.18506E+08	-.20679E+07	.00000	.13128E+08	.00000	.00000
897	-.15666E+08	-.43616E+07	.00000	.15877E+08	.00000	.00000
898	-.18351E+08	-.66570E+06	.00000	.10490E+08	.00000	.00000
899	-.21032E+08	-.34867E+07	.00000	.11920E+08	.00000	.00000
900	-.19339E+08	-.13680E+07	.00000	.97726E+07	.00000	.00000
901	.10202E+08	.76205E+06	.00000	-.44653E+06	.00000	.00000
902	.12039E+08	.66149E+06	.00000	-42048.	.00000	.00000
903	.18011E+08	-.35401E+07	.00000	-.44102E+07	.00000	.00000
904	.19771E+08	-.41335E+07	.00000	-.75965E+07	.00000	.00000
905	.16086E+08	-.29567E+07	.00000	-.88086E+07	.00000	.00000
906	.14739E+08	-.24165E+07	.00000	-.91623E+07	.00000	.00000
907	.16671E+08	-.33255E+07	.00000	-.74429E+07	.00000	.00000
908	.12843E+08	-.25543E+07	.00000	-.81361E+07	.00000	.00000
909	.13751E+08	-.20771E+07	.00000	-.87300E+07	.00000	.00000
910	.13619E+08	-.25017E+07	.00000	-.78215E+07	.00000	.00000
911	.14078E+08	-.27097E+07	.00000	-.79911E+07	.00000	.00000
912	.13582E+08	-.10217E+07	.00000	-.94477E+06	.00000	.00000
913	.14207E+08	-.17981E+07	.00000	-.85475E+07	.00000	.00000
914	.15668E+08	-.30212E+07	.00000	-.58523E+07	.00000	.00000
915	.86153E+07	-.38947E+06	.00000	-.89574E+06	.00000	.00000
916	.13419E+08	-.21953E+07	.00000	-.81448E+07	.00000	.00000
917	.13806E+08	-.21618E+07	.00000	-.78971E+07	.00000	.00000
918	.13907E+08	-.23464E+07	.00000	-.78508E+07	.00000	.00000
919	.13894E+08	-.23496E+07	.00000	-.79630E+07	.00000	.00000
920	.14066E+08	-.25159E+07	.00000	-.84228E+07	.00000	.00000
921	.12868E+08	-.98221E+06	.00000	-.92882E+07	.00000	.00000
922	.11741E+08	.35052E+06	.00000	-.95525E+07	.00000	.00000
923	.10116E+08	.20458E+07	.00000	-.93799E+07	.00000	.00000
924	.64707E+07	.47605E+07	.00000	-.72326E+07	.00000	.00000
925	.13614E+08	-.18610E+07	.00000	-.89215E+07	.00000	.00000
926	.12959E+08	-.16619E+07	.00000	-.84514E+07	.00000	.00000
927	.12006E+08	-.77795E+06	.00000	-.87201E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
928	.84832E+07	.34830E+07	.00000	-.87218E+07	.00000	.00000
929	.75098E+07	.28080E+07	.00000	-.75394E+07	.00000	.00000
930	.45912E+07	.49238E+07	.00000	-.49213E+07	.00000	.00000
931	.28251E+07	.28690E+07	.00000	-.25387E+07	.00000	.00000
932	.42839E+07	.49747E+07	.00000	-.39715E+07	.00000	.00000
933	.37839E+07	.37014E+07	.00000	-.29882E+07	.00000	.00000
934	-.91090E+06	-.12005E+07	.00000	-72122.	.00000	.00000
935	-.28264E+07	-.15422E+07	.00000	-.95843E+06	.00000	.00000
936	-.17368E+08	.11503E+08	.00000	.19979E+07	.00000	.00000
937	-.16006E+08	.12379E+08	.00000	.17182E+07	.00000	.00000
938	-.14993E+08	.13353E+08	.00000	.87577E+06	.00000	.00000
939	-.13957E+08	.14470E+08	.00000	-.11730E+06	.00000	.00000
940	-.12966E+08	.16047E+08	.00000	-.12227E+07	.00000	.00000
941	-.17829E+08	.10663E+08	.00000	.23560E+07	.00000	.00000
942	-.17262E+08	.10754E+08	.00000	.28320E+07	.00000	.00000
943	-.16762E+08	.11550E+08	.00000	.23497E+07	.00000	.00000
944	-.15785E+08	.12405E+08	.00000	.19002E+07	.00000	.00000
945	-.14904E+08	.13396E+08	.00000	.10065E+07	.00000	.00000
946	-.13935E+08	.14590E+08	.00000	-.10798E+06	.00000	.00000
947	-.12997E+08	.15720E+08	.00000	-.12069E+07	.00000	.00000
948	-.12053E+08	.17338E+08	.00000	-.20756E+07	.00000	.00000
949	-.12118E+08	.16944E+08	.00000	-.22177E+07	.00000	.00000
950	-.11259E+08	.17994E+08	.00000	-.29718E+07	.00000	.00000
951	-.17910E+08	.96742E+07	.00000	.25795E+07	.00000	.00000
952	-.18468E+08	.94120E+07	.00000	.14523E+07	.00000	.00000
953	-.16879E+08	.74805E+07	.00000	.12175E+07	.00000	.00000
954	-.17151E+08	.79775E+07	.00000	.31933E+07	.00000	.00000
955	-.17445E+08	.98022E+07	.00000	.33869E+07	.00000	.00000
956	.61372E+07	-.14945E+07	.00000	.67994E+06	.00000	.00000
957	.64770E+07	-.64872E+06	.00000	-.20405E+06	.00000	.00000
958	-.64008E+06	.83439E+06	.00000	-73460.	.00000	.00000
959	-.72505E+06	.47012E+06	.00000	-.24988E+06	.00000	.00000
960	.63335E+07	.69370E+06	.00000	-.34791E+06	.00000	.00000
961	-.38375E+07	.12062E+08	.00000	-.63095E+06	.00000	.00000
962	.10141E+07	.63052E+06	.00000	-76950.	.00000	.00000
963	.13805E+07	.20264E+07	.00000	.45888E+06	.00000	.00000
964	.69937E+06	.21861E+07	.00000	.46626E+06	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
965	-.86093E+06	.48597E+07	.00000	50800.	.00000	.00000
966	-.18302E+07	.70678E+07	.00000	-.12758E+07	.00000	.00000
967	-.27985E+07	.10380E+08	.00000	-.25437E+07	.00000	.00000
968	-.37681E+07	.14130E+08	.00000	-.46711E+07	.00000	.00000
969	-.11544E+07	.15549E+08	.00000	-.74773E+07	.00000	.00000
970	-.41391E+07	.17655E+08	.00000	-.70296E+07	.00000	.00000
971	-.24357E+07	.18517E+08	.00000	-.84882E+07	.00000	.00000
972	-.10101E+07	.19681E+08	.00000	-.98209E+07	.00000	.00000
973	-.35627E+06	.20994E+08	.00000	-.10819E+08	.00000	.00000
974	.43088E+07	.20630E+08	.00000	-.12915E+08	.00000	.00000
975	.40505E+07	.22835E+08	.00000	-.14004E+08	.00000	.00000
976	.75354E+07	.24553E+08	.00000	-.16770E+08	.00000	.00000
977	.15216E+08	.26694E+08	.00000	-.23136E+08	.00000	.00000
978	.19886E+08	.26178E+08	.00000	-.25368E+08	.00000	.00000
979	.70385E+07	.25623E+08	.00000	-.19455E+08	.00000	.00000
980	.86930E+07	.23891E+08	.00000	-.21263E+08	.00000	.00000
981	.13802E+08	.22701E+08	.00000	-.23312E+08	.00000	.00000
982	.23181E+08	.24947E+08	.00000	-.26418E+08	.00000	.00000
983	.25490E+08	.23162E+08	.00000	-.26494E+08	.00000	.00000
984	.26087E+08	.20314E+08	.00000	-.25051E+08	.00000	.00000
985	.28862E+08	.21294E+08	.00000	-.25763E+08	.00000	.00000
986	.29272E+08	.20386E+08	.00000	-.24743E+08	.00000	.00000
987	.29026E+08	.20099E+08	.00000	-.24288E+08	.00000	.00000
988	.27782E+08	.19109E+08	.00000	-.23115E+08	.00000	.00000
989	.25917E+08	.15926E+08	.00000	-.20512E+08	.00000	.00000
990	.26627E+08	.17657E+08	.00000	-.21810E+08	.00000	.00000
991	.25532E+08	.16524E+08	.00000	-.20747E+08	.00000	.00000
992	.25712E+08	.17556E+08	.00000	-.21412E+08	.00000	.00000
993	.25495E+08	.18017E+08	.00000	-.21569E+08	.00000	.00000
994	.25190E+08	.18222E+08	.00000	-.21544E+08	.00000	.00000
995	.24256E+08	.17101E+08	.00000	-.20517E+08	.00000	.00000
996	.21023E+08	.13542E+08	.00000	-.17101E+08	.00000	.00000
997	.25458E+08	.15678E+08	.00000	-.20192E+08	.00000	.00000
998	.24700E+08	.14805E+08	.00000	-.19413E+08	.00000	.00000

999	.23293E+08	.12937E+08	.00000	-.17828E+08	.00000	.00000
1000	.23737E+08	.14022E+08	.00000	-.18623E+08	.00000	.00000
1001	.23852E+08	.14786E+08	.00000	-.19094E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1002	.23879E+08	.15518E+08	.00000	-.19492E+08	.00000	.00000
1003	.22968E+08	.14751E+08	.00000	-.18659E+08	.00000	.00000
1004	.21011E+08	.11766E+08	.00000	-.16154E+08	.00000	.00000
1005	.20105E+08	.10545E+08	.00000	-.15084E+08	.00000	.00000
1006	.19266E+08	.94387E+07	.00000	-.14107E+08	.00000	.00000
1007	.20083E+08	.12475E+08	.00000	-.16093E+08	.00000	.00000
1008	.18931E+08	.11380E+08	.00000	-.14981E+08	.00000	.00000
1009	.18319E+08	.10951E+08	.00000	-.14472E+08	.00000	.00000
1010	.17640E+08	.10394E+08	.00000	-.13870E+08	.00000	.00000
1011	.16900E+08	.96910E+07	.00000	-.13167E+08	.00000	.00000
1012	.16229E+08	.88847E+07	.00000	-.12450E+08	.00000	.00000
1013	.16136E+08	.67403E+07	.00000	-.11368E+08	.00000	.00000
1014	.15678E+08	.58437E+07	.00000	-.10743E+08	.00000	.00000
1015	.15566E+08	.78762E+07	.00000	-.11650E+08	.00000	.00000
1016	.14105E+08	.68392E+07	.00000	-.10468E+08	.00000	.00000
1017	.13864E+08	.47950E+07	.00000	-.94673E+07	.00000	.00000
1018	.13338E+08	.37794E+07	.00000	-.87917E+07	.00000	.00000
1019	.12307E+08	-.10541E+07	.00000	-.55352E+07	.00000	.00000
1020	.12686E+08	-.20701E+07	.00000	-.40437E+07	.00000	.00000
1021	.89038E+07	-.10952E+07	.00000	-.17717E+07	.00000	.00000
1022	.49351E+07	-70000.	.00000	-.71161E+06	.00000	.00000
1023	.37778E+07	.59235E+06	.00000	-.37194E+06	.00000	.00000
1024	.26747E+07	.87769E+06	.00000	-.24145E+06	.00000	.00000
1025	-.39592E+07	.68739E+07	.00000	-.12759E+07	.00000	.00000
1026	-.14227E+07	.40314E+07	.00000	-.20723E+06	.00000	.00000
1027	-.31365E+06	.17459E+07	.00000	-.65887E+06	.00000	.00000
1028	-.29160E+07	.53923E+07	.00000	-.26928E+07	.00000	.00000
1029	-.55356E+06	.25921E+07	.00000	-.17000E+07	.00000	.00000
1030	.21636E+08	.12661E+08	.00000	-.16915E+08	.00000	.00000
1031	.14433E+08	-.19684E+07	.00000	-.67291E+07	.00000	.00000
1032	.13648E+08	-.21483E+07	.00000	-.25973E+07	.00000	.00000
1033	.73833E+07	.61946E+06	.00000	-.33423E+06	.00000	.00000
1034	.19930E+07	.25424E+08	.00000	-.16297E+08	.00000	.00000
1035	.53717E+06	.24892E+08	.00000	-.16477E+08	.00000	.00000
1036	.13839E+08	-.60022E+06	.00000	-.74344E+07	.00000	.00000
1037	.14533E+08	-.12934E+07	.00000	-.80312E+07	.00000	.00000
1038	.15301E+07	.96950E+06	.00000	-.15990E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1039	.20463E+07	.11374E+07	.00000	-.16945E+07	.00000	.00000
1040	.25105E+07	.19102E+07	.00000	-.27421E+07	.00000	.00000
1041	.27538E+07	.23848E+07	.00000	-.20575E+07	.00000	.00000
1042	.13733E+08	.89407E+06	.00000	-.80190E+07	.00000	.00000
1043	.13289E+07	.15646E+07	.00000	-.23237E+07	.00000	.00000
1044	.32344E+07	.33053E+07	.00000	-.27394E+07	.00000	.00000
1045	.22947E+07	.19846E+07	.00000	-.23357E+07	.00000	.00000
1046	.15553E+07	.91409E+06	.00000	-.14609E+07	.00000	.00000
1047	.28394E+07	.94379E+06	.00000	-.25030E+07	.00000	.00000
1048	.30784E+07	-.17466E+06	.00000	-.20469E+07	.00000	.00000
1049	.20902E+07	-.16144E+07	.00000	-.44329E+06	.00000	.00000
1050	.16218E+07	-.23506E+07	.00000	.27899E+06	.00000	.00000
1051	.63004E+06	-.32343E+07	.00000	.13261E+07	.00000	.00000
1052	.32316E+07	-.32701E+07	.00000	-63884.	.00000	.00000
1053	.28272E+07	-.39379E+07	.00000	.57456E+06	.00000	.00000
1054	.14737E+06	-.54950E+07	.00000	.28095E+07	.00000	.00000
1055	-.14228E+07	-.62658E+07	.00000	.39761E+07	.00000	.00000
1056	.20044E+07	-.55936E+07	.00000	.19691E+07	.00000	.00000
1057	.57536E+06	-.63765E+07	.00000	.30877E+07	.00000	.00000
1058	-.21731E+07	-.69064E+07	.00000	.46894E+07	.00000	.00000
1059	-.26058E+07	-.74961E+07	.00000	.52049E+07	.00000	.00000
1060	-.33802E+07	-.81985E+07	.00000	.59409E+07	.00000	.00000
1061	-.43858E+07	-.89865E+07	.00000	.68285E+07	.00000	.00000
1062	-.47172E+07	-.96000E+07	.00000	.73015E+07	.00000	.00000
1063	-.47134E+07	-.10258E+08	.00000	.76090E+07	.00000	.00000
1064	-.14341E+07	-.90318E+07	.00000	.53993E+07	.00000	.00000
1065	-.19908E+07	-.97304E+07	.00000	.59583E+07	.00000	.00000
1066	-.63712E+07	-.11353E+08	.00000	.89440E+07	.00000	.00000
1067	-.74689E+07	-.12339E+08	.00000	.99448E+07	.00000	.00000
1068	-.83646E+07	-.13378E+08	.00000	.10855E+08	.00000	.00000

1069	-.90960E+07	-.14484E+08	.00000	.11692E+08	.00000	.00000
1070	-.10187E+08	-.15727E+08	.00000	.12818E+08	.00000	.00000
1071	-.11897E+08	-.17152E+08	.00000	.14385E+08	.00000	.00000
1072	.27358E+07	-.49195E+07	.00000	.12272E+07	.00000	.00000
1073	.39110E+07	-.49557E+07	.00000	.69244E+06	.00000	.00000
1074	.32364E+07	-.56051E+07	.00000	.14061E+07	.00000	.00000
1075	-.12386E+08	-.20526E+08	.00000	.17553E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1076	-.13084E+08	-.19193E+08	.00000	.18420E+08	.00000	.00000
1077	-.11362E+07	-.15171E+08	.00000	.10754E+08	.00000	.00000
1078	-.56132E+07	-.15527E+08	.00000	.14618E+08	.00000	.00000
1079	-.11205E+08	-.81315E+07	.00000	.17093E+08	.00000	.00000
1080	-.18099E+08	-.13129E+08	.00000	.19318E+08	.00000	.00000
1081	-.21437E+08	-.10127E+08	.00000	.18252E+08	.00000	.00000
1082	-.23227E+08	-.77982E+07	.00000	.15846E+08	.00000	.00000
1083	-.23553E+08	-.10523E+08	.00000	.16393E+08	.00000	.00000
1084	-.22039E+08	-.90365E+07	.00000	.14894E+08	.00000	.00000
1085	-.20791E+08	-.65567E+07	.00000	.13047E+08	.00000	.00000
1086	-.20599E+08	-.35217E+07	.00000	.11219E+08	.00000	.00000
1087	-.18833E+08	-.15830E+07	.00000	.99979E+07	.00000	.00000
1088	-.18211E+08	-.37841E+07	.00000	.10779E+08	.00000	.00000
1089	-.17191E+08	-.33818E+07	.00000	.10102E+08	.00000	.00000
1090	-.15813E+08	-.11713E+07	.00000	.84302E+07	.00000	.00000
1091	-.14657E+08	.18558E+07	.00000	.61120E+07	.00000	.00000
1092	-.89270E+07	.24447E+07	.00000	.17127E+07	.00000	.00000
1093	-.69307E+07	.19053E+07	.00000	.30172E+06	.00000	.00000
1094	-.53815E+07	.92358E+06	.00000	-.57136E+06	.00000	.00000
1095	-.25339E+07	-.61110E+06	.00000	-.64031E+06	.00000	.00000
1096	-.37544E+06	-.79997E+06	.00000	-.19459E+06	.00000	.00000
1097	.48216E+06	-.82227E+06	.00000	.13668E+06	.00000	.00000
1098	-.46923E+07	-.17408E+08	.00000	.11789E+08	.00000	.00000
1099	-.12038E+08	.41168E+07	.00000	.82179E+06	.00000	.00000
1100	-.95840E+07	.27188E+07	.00000	-.46426E+06	.00000	.00000
1101	-.77774E+07	.15956E+07	.00000	-.10539E+07	.00000	.00000
1102	-.55180E+07	-50325.	.00000	-.15586E+07	.00000	.00000
1103	.25678E+07	-.45048E+07	.00000	.10550E+07	.00000	.00000
1104	.43306E+07	-.45007E+07	.00000	.19598E+06	.00000	.00000
1105	.55778E+07	-.43312E+07	.00000	-.49466E+06	.00000	.00000
1106	.54186E+07	-.47454E+07	.00000	-.13687E+06	.00000	.00000
1107	.44510E+07	-.55473E+07	.00000	.80736E+06	.00000	.00000
1108	.19974E+08	.92484E+07	.00000	-.14334E+08	.00000	.00000
1109	.18998E+08	.78524E+07	.00000	-.13145E+08	.00000	.00000
1110	.25059E+07	.25372E+08	.00000	-.15621E+08	.00000	.00000
1111	-.37236E+07	.24542E+08	.00000	-.12534E+08	.00000	.00000
1112	-.43118E+07	.24515E+08	.00000	-.13146E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1113	.13987E+07	-.14056E+08	.00000	.74548E+07	.00000	.00000
1114	.77546E+06	-.13250E+08	.00000	.11600E+08	.00000	.00000
1115	-.81006E+07	-.17644E+08	.00000	.12469E+08	.00000	.00000
1116	-.34552E+07	-.16526E+08	.00000	.97411E+07	.00000	.00000
1117	.15017E+07	-.13500E+08	.00000	.57241E+07	.00000	.00000
1118	-.71875E+07	-.16250E+08	.00000	.11229E+08	.00000	.00000
1119	-.18811E+07	-.14674E+08	.00000	.73567E+07	.00000	.00000
1120	.27902E+07	-.11514E+08	.00000	.31009E+07	.00000	.00000
1121	.53231E+07	-.90512E+07	.00000	.47614E+06	.00000	.00000
1122	-.15888E+08	.56357E+07	.00000	.43057E+07	.00000	.00000
1123	-.17277E+08	.81422E+07	.00000	.40974E+07	.00000	.00000
1124	-.17318E+08	.86022E+07	.00000	.44590E+07	.00000	.00000
1125	-.17086E+08	.10225E+08	.00000	.35896E+07	.00000	.00000
1126	-.16907E+08	.10907E+08	.00000	.30085E+07	.00000	.00000
1127	-.16472E+08	.11568E+08	.00000	.25673E+07	.00000	.00000
1128	-.15769E+08	.12369E+08	.00000	.21145E+07	.00000	.00000
1129	-.14916E+08	.13496E+08	.00000	.11010E+07	.00000	.00000
1130	-.14030E+08	.14713E+08	.00000	-40806.	.00000	.00000
1131	-.13056E+08	.15760E+08	.00000	-.12207E+07	.00000	.00000
1132	-.12101E+08	.16968E+08	.00000	-.23692E+07	.00000	.00000
1133	-.11162E+08	.17919E+08	.00000	-.32689E+07	.00000	.00000
1134	-.10279E+08	.18486E+08	.00000	-.38039E+07	.00000	.00000
1135	-.98779E+07	.18811E+08	.00000	-.33778E+07	.00000	.00000
1136	-.86030E+07	.18466E+08	.00000	-.39055E+07	.00000	.00000
1137	-.87703E+07	.18636E+08	.00000	-.47790E+07	.00000	.00000
1138	-.75708E+07	.18275E+08	.00000	-.50781E+07	.00000	.00000

1139	-.75775E+07	.17669E+08	.00000	-.32026E+07	.00000	.00000
1140	-.58694E+07	.15317E+08	.00000	-.12697E+07	.00000	.00000
1141	-.20574E+07	.82669E+07	.00000	-.10363E+06	.00000	.00000
1142	.69304E+06	-.21823E+06	.00000	-.22724E+06	.00000	.00000
1143	.51032E+06	.62789E+06	.00000	-.25437E+06	.00000	.00000
1144	-.11369E+08	.29096E+07	.00000	-.19609E+07	.00000	.00000
1145	-.14588E+08	.53297E+07	.00000	-.74405E+06	.00000	.00000
1146	-35817.	.74025E+06	.00000	-.28912E+06	.00000	.00000
1147	-.40814E+07	-.11041E+08	.00000	.15216E+08	.00000	.00000
1148	.11361E+08	.34819E+07	.00000	-.95233E+07	.00000	.00000
1149	.11987E+08	.45028E+07	.00000	-.94889E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1150	.10628E+08	.28026E+07	.00000	-.80576E+07	.00000	.00000
1151	.66651E+07	-.61978E+07	.00000	-.22072E+07	.00000	.00000
1152	.80471E+07	-.24936E+07	.00000	-.48473E+07	.00000	.00000
1153	.92393E+07	.31409E+06	.00000	-.65948E+07	.00000	.00000
1154	.15202E+08	.60169E+07	.00000	-.11896E+08	.00000	.00000
1155	.12805E+08	.47461E+07	.00000	-.95938E+07	.00000	.00000
1156	.15886E+08	.67140E+07	.00000	-.11813E+08	.00000	.00000
1157	.19021E+08	.89352E+07	.00000	-.15357E+08	.00000	.00000
1158	.16601E+08	.89222E+07	.00000	-.19547E+08	.00000	.00000
1159	.20506E+08	.15459E+08	.00000	-.22465E+08	.00000	.00000
1160	.21638E+08	.19976E+08	.00000	-.24603E+08	.00000	.00000
1161	.66212E+07	-.88613E+07	.00000	.27696E+06	.00000	.00000
1162	.47494E+07	-.83568E+07	.00000	-12179.	.00000	.00000
1163	.16679E+07	-.11239E+08	.00000	.33522E+07	.00000	.00000
1164	.70720E+07	-.45138E+07	.00000	-.31408E+07	.00000	.00000
1165	.10169E+08	-.40497E+06	.00000	-.60962E+07	.00000	.00000
1166	.95023E+07	-.38408E+06	.00000	-.61221E+07	.00000	.00000
1167	.11331E+08	.23014E+07	.00000	-.79143E+07	.00000	.00000
1168	.13515E+08	.45547E+07	.00000	-.96321E+07	.00000	.00000
1169	.16603E+08	.69838E+07	.00000	-.11951E+08	.00000	.00000
1170	.19538E+08	.94365E+07	.00000	-.14846E+08	.00000	.00000
1171	.23080E+08	.12777E+08	.00000	-.18122E+08	.00000	.00000
1172	.22820E+08	.12888E+08	.00000	-.18925E+08	.00000	.00000
1173	.22039E+08	.13220E+08	.00000	-.20220E+08	.00000	.00000
1174	.25953E+08	.17841E+08	.00000	-.23274E+08	.00000	.00000
1175	.28806E+07	.24186E+08	.00000	-.18626E+08	.00000	.00000
1176	-.53943E+07	.24213E+08	.00000	-.13632E+08	.00000	.00000
1177	-.12395E+08	.22327E+08	.00000	-.67168E+07	.00000	.00000
1178	-.14825E+08	.20975E+08	.00000	-.41608E+07	.00000	.00000
1179	-.16173E+08	.19572E+08	.00000	-.20775E+07	.00000	.00000
1180	-.16949E+08	.18226E+08	.00000	-.43640E+06	.00000	.00000
1181	-.17522E+08	.16211E+08	.00000	.15432E+07	.00000	.00000
1182	-.86129E+07	.23540E+08	.00000	-.96006E+07	.00000	.00000
1183	-.81326E+07	.23335E+08	.00000	-.90522E+07	.00000	.00000
1184	-.10908E+08	.22432E+08	.00000	-.70010E+07	.00000	.00000
1185	-.13187E+08	.21268E+08	.00000	-.47946E+07	.00000	.00000
1186	-.14903E+08	.19853E+08	.00000	-.26431E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1187	-.16194E+08	.18044E+08	.00000	-.44503E+06	.00000	.00000
1188	-.16667E+08	.16143E+08	.00000	.12716E+07	.00000	.00000
1189	-.17680E+08	.13726E+08	.00000	.33604E+07	.00000	.00000
1190	-.18114E+08	.11229E+08	.00000	.50107E+07	.00000	.00000
1191	-.18050E+08	.88063E+07	.00000	.61457E+07	.00000	.00000
1192	-.17891E+08	.59819E+07	.00000	.70316E+07	.00000	.00000
1193	-.17898E+08	.31831E+07	.00000	.77811E+07	.00000	.00000
1194	-.18099E+08	.11145E+07	.00000	.82618E+07	.00000	.00000
1195	-.18623E+08	-.31996E+06	.00000	.88294E+07	.00000	.00000
1196	-.21388E+06	.31666E+07	.00000	-.38588E+07	.00000	.00000
1197	.15267E+08	-.23578E+07	.00000	-.77934E+07	.00000	.00000
1198	.15164E+08	-.23029E+07	.00000	-.85062E+07	.00000	.00000
1199	.14585E+08	-.16120E+07	.00000	-.84167E+07	.00000	.00000
1200	.14228E+08	-.13797E+07	.00000	-.82612E+07	.00000	.00000
1201	.13805E+08	-.18929E+07	.00000	-.81793E+07	.00000	.00000
1202	.14045E+08	-.16347E+07	.00000	-.81219E+07	.00000	.00000
1203	.13958E+08	-.18590E+07	.00000	-.79224E+07	.00000	.00000
1204	.13897E+08	-.20161E+07	.00000	-.78372E+07	.00000	.00000
1205	.13715E+08	-.20523E+07	.00000	-.78320E+07	.00000	.00000
1206	.13525E+08	-.21124E+07	.00000	-.81459E+07	.00000	.00000
1207	.12819E+08	-.17420E+07	.00000	-.79770E+07	.00000	.00000
1208	.12241E+08	-.14096E+07	.00000	-.80392E+07	.00000	.00000

1209	.11087E+08	-.65973E+06	.00000	-.80109E+07	.00000	.00000
1210	.10555E+08	.50302E+06	.00000	-.86908E+07	.00000	.00000
1211	.83970E+07	.14534E+07	.00000	-.75495E+07	.00000	.00000
1212	.69068E+07	.19843E+07	.00000	-.65634E+07	.00000	.00000
1213	.56105E+07	.33778E+07	.00000	-.59749E+07	.00000	.00000
1214	.48165E+07	.20960E+07	.00000	-.47463E+07	.00000	.00000
1215	.37015E+07	.26055E+07	.00000	-.38193E+07	.00000	.00000
1216	.54470E+07	.10953E+07	.00000	-.47632E+07	.00000	.00000
1217	.39229E+07	.50656E+06	.00000	-.31330E+07	.00000	.00000
1218	-.79959E+07	.18844E+08	.00000	-.56009E+07	.00000	.00000
1219	-.51072E+07	.19194E+08	.00000	-.74639E+07	.00000	.00000
1220	-.43020E+07	.20098E+08	.00000	-.83660E+07	.00000	.00000
1221	-.12680E+07	.22243E+08	.00000	-.11029E+08	.00000	.00000
1222	-.18608E+07	.23649E+08	.00000	-.11684E+08	.00000	.00000
1223	.90375E+06	.24636E+08	.00000	-.13910E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1224	-.33516E+07	.21695E+08	.00000	-.96646E+07	.00000	.00000
1225	-.61518E+07	.21629E+08	.00000	-.81264E+07	.00000	.00000
1226	-.52799E+07	.22618E+08	.00000	-.92230E+07	.00000	.00000
1227	-.87402E+07	.22724E+08	.00000	-.78832E+07	.00000	.00000
1228	-.44526E+07	.24081E+08	.00000	-.11212E+08	.00000	.00000
1229	-.36981E+07	.21024E+08	.00000	-.91339E+07	.00000	.00000
1230	-.65244E+07	.20892E+08	.00000	-.75515E+07	.00000	.00000
1231	-.90679E+07	.20926E+08	.00000	-.60859E+07	.00000	.00000
1232	-.86889E+07	.21918E+08	.00000	-.69721E+07	.00000	.00000
1233	-.10404E+08	.21746E+08	.00000	-.61086E+07	.00000	.00000
1234	-.12361E+08	.20309E+08	.00000	-.39133E+07	.00000	.00000
1235	-.11883E+08	.21440E+08	.00000	-.53026E+07	.00000	.00000
1236	-.10542E+08	.22235E+08	.00000	-.67216E+07	.00000	.00000
1237	-.13700E+08	.20018E+08	.00000	-.31275E+07	.00000	.00000
1238	-.15255E+08	.18080E+08	.00000	-.80242E+06	.00000	.00000
1239	-.15429E+08	.17083E+08	.00000	29295.	.00000	.00000
1240	-.16200E+08	.15832E+08	.00000	.12641E+07	.00000	.00000
1241	-.17071E+08	.13519E+08	.00000	.31418E+07	.00000	.00000
1242	-.17670E+08	.11653E+08	.00000	.45116E+07	.00000	.00000
1243	-.17710E+08	.10040E+08	.00000	.52887E+07	.00000	.00000
1244	-.17991E+08	.52076E+07	.00000	.70812E+07	.00000	.00000
1245	-.18297E+08	.28477E+07	.00000	.78665E+07	.00000	.00000
1246	-.18960E+08	.46300E+06	.00000	.87538E+07	.00000	.00000
1247	-.19784E+08	-.14357E+07	.00000	.97599E+07	.00000	.00000
1248	-.20466E+08	-.26896E+07	.00000	.10689E+08	.00000	.00000
1249	-.21897E+08	-.57310E+07	.00000	.12916E+08	.00000	.00000
1250	.26393E+08	.16547E+08	.00000	-.21499E+08	.00000	.00000
1251	.26212E+08	.16205E+08	.00000	-.20917E+08	.00000	.00000
1252	.23034E+08	.12340E+08	.00000	-.17271E+08	.00000	.00000
1253	.23751E+08	.13277E+08	.00000	-.18128E+08	.00000	.00000
1254	.22480E+08	.11572E+08	.00000	-.16708E+08	.00000	.00000
1255	.21124E+08	.96755E+07	.00000	-.15135E+08	.00000	.00000
1256	.21674E+08	.10631E+08	.00000	-.15891E+08	.00000	.00000
1257	.21876E+08	.11200E+08	.00000	-.16279E+08	.00000	.00000
1258	.22230E+08	.12364E+08	.00000	-.17057E+08	.00000	.00000
1259	.21172E+08	.11120E+08	.00000	-.15905E+08	.00000	.00000
1260	.19922E+08	.83219E+07	.00000	-.13843E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1261	.18704E+08	.67143E+07	.00000	-.12412E+08	.00000	.00000
1262	.17831E+08	.55922E+07	.00000	-.11406E+08	.00000	.00000
1263	.40342E+07	.34943E+07	.00000	-.43088E+07	.00000	.00000
1264	.16909E+08	.40079E+07	.00000	-.10153E+08	.00000	.00000
1265	.16600E+08	.36968E+07	.00000	-.98302E+07	.00000	.00000
1266	.16399E+08	.35163E+07	.00000	-.96425E+07	.00000	.00000
1267	.15288E+08	.20262E+07	.00000	-.83323E+07	.00000	.00000
1268	.15490E+08	.23171E+07	.00000	-.85774E+07	.00000	.00000
1269	.17050E+08	.45480E+07	.00000	-.10487E+08	.00000	.00000
1270	.17931E+08	.62923E+07	.00000	-.11825E+08	.00000	.00000
1271	.17704E+08	.63997E+07	.00000	-.11795E+08	.00000	.00000
1272	.18309E+08	.88300E+07	.00000	-.13358E+08	.00000	.00000
1273	.17866E+08	.86520E+07	.00000	-.13070E+08	.00000	.00000
1274	.17303E+08	.81873E+07	.00000	-.12584E+08	.00000	.00000
1275	-.59531E+07	.17169E+08	.00000	-.51929E+07	.00000	.00000
1276	.16797E+08	.61262E+07	.00000	-.11311E+08	.00000	.00000
1277	.16331E+08	.54976E+07	.00000	-.10824E+08	.00000	.00000
1278	.16668E+08	.74966E+07	.00000	-.11961E+08	.00000	.00000

1279	.15960E+08	.51083E+07	.00000	-.10507E+08	.00000	.00000
1280	.15717E+08	.48328E+07	.00000	-.10305E+08	.00000	.00000
1281	.15276E+08	.41214E+07	.00000	-.98339E+07	.00000	.00000
1282	.14887E+08	.65554E+07	.00000	-.10715E+08	.00000	.00000
1283	.14574E+08	.47207E+07	.00000	-.97871E+07	.00000	.00000
1284	.14285E+08	.34388E+07	.00000	-.91617E+07	.00000	.00000
1285	.14019E+08	.21404E+07	.00000	-.86000E+07	.00000	.00000
1286	.14299E+08	-.24024E+06	.00000	-.82173E+07	.00000	.00000
1287	.14383E+08	-.95874E+06	.00000	-.82974E+07	.00000	.00000
1288	.14243E+08	-.11424E+07	.00000	-.81292E+07	.00000	.00000
1289	.14136E+08	-.14381E+07	.00000	-.80537E+07	.00000	.00000
1290	.14064E+08	-.15479E+07	.00000	-.79296E+07	.00000	.00000
1291	.13873E+08	-.17082E+07	.00000	-.77887E+07	.00000	.00000
1292	.13602E+08	-.18036E+07	.00000	-.77046E+07	.00000	.00000
1293	.13276E+08	-.19311E+07	.00000	-.78026E+07	.00000	.00000
1294	.12573E+08	-.16927E+07	.00000	-.76701E+07	.00000	.00000
1295	.11699E+08	-.13578E+07	.00000	-.75311E+07	.00000	.00000
1296	.10461E+08	-.84448E+06	.00000	-.72084E+07	.00000	.00000
1297	.91943E+07	.52320E+06	.00000	-.75380E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1298	.71295E+07	.10498E+07	.00000	-.61680E+07	.00000	.00000
1299	.71813E+07	.33075E+06	.00000	-.56676E+07	.00000	.00000
1300	.53606E+07	77077.	.00000	-.39828E+07	.00000	.00000
1301	.47109E+07	-.52724E+06	.00000	-.30211E+07	.00000	.00000
1302	.25231E+07	-.90910E+06	.00000	-.11730E+07	.00000	.00000
1303	.37787E+07	-.18473E+07	.00000	-.13693E+07	.00000	.00000
1304	.56361E+07	-.13902E+07	.00000	-.29717E+07	.00000	.00000
1305	.57186E+07	-.31204E+07	.00000	-.15232E+07	.00000	.00000
1306	.48988E+07	-.37562E+07	.00000	-.60314E+06	.00000	.00000
1307	.53523E+07	-.25245E+07	.00000	-.18172E+07	.00000	.00000
1308	.76629E+07	-.26279E+07	.00000	-.29681E+07	.00000	.00000
1309	.71973E+07	-.31453E+07	.00000	-.22185E+07	.00000	.00000
1310	.67366E+07	-.35110E+07	.00000	-.16693E+07	.00000	.00000
1311	.46211E+07	-.41836E+07	.00000	-.15962E+06	.00000	.00000
1312	.62720E+07	-.39041E+07	.00000	-.11314E+07	.00000	.00000
1313	.35034E+07	-.25321E+07	.00000	-.71474E+06	.00000	.00000
1314	.54475E+07	-.19409E+07	.00000	-.23678E+07	.00000	.00000
1315	.71384E+07	-.23240E+07	.00000	-.30278E+07	.00000	.00000
1316	.91267E+07	-.22563E+07	.00000	-.40829E+07	.00000	.00000
1317	.84727E+07	-.27049E+07	.00000	-.32232E+07	.00000	.00000
1318	.82788E+07	-.29806E+07	.00000	-.28101E+07	.00000	.00000
1319	.83205E+07	-.31331E+07	.00000	-.26526E+07	.00000	.00000
1320	.78878E+07	-.34750E+07	.00000	-.21440E+07	.00000	.00000
1321	.70486E+07	-.39903E+07	.00000	-.13731E+07	.00000	.00000
1322	.71799E+06	-.67503E+07	.00000	.32275E+07	.00000	.00000
1323	.22896E+08	.12280E+08	.00000	-.17180E+08	.00000	.00000
1324	.19768E+08	.91090E+07	.00000	-.14177E+08	.00000	.00000
1325	.19533E+08	.83439E+07	.00000	-.13688E+08	.00000	.00000
1326	.21342E+08	.10107E+08	.00000	-.15404E+08	.00000	.00000
1327	.20115E+08	.83242E+07	.00000	-.13976E+08	.00000	.00000
1328	.18734E+08	.63724E+07	.00000	-.12343E+08	.00000	.00000
1329	.19345E+08	.71488E+07	.00000	-.13008E+08	.00000	.00000
1330	.19623E+08	.76264E+07	.00000	-.13364E+08	.00000	.00000
1331	.16979E+08	.39673E+07	.00000	-.10203E+08	.00000	.00000
1332	-19234.	-.73876E+07	.00000	.39170E+07	.00000	.00000
1333	-.90789E+06	-.80647E+07	.00000	.46857E+07	.00000	.00000
1334	-.15219E+07	-.86850E+07	.00000	.52843E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1335	.11965E+07	-.82557E+07	.00000	.36578E+07	.00000	.00000
1336	.74657E+06	-.86920E+07	.00000	.40411E+07	.00000	.00000
1337	-.30425E+07	-.10553E+08	.00000	.68346E+07	.00000	.00000
1338	-.37552E+07	-.11396E+08	.00000	.75185E+07	.00000	.00000
1339	-.41679E+07	-.12286E+08	.00000	.80117E+07	.00000	.00000
1340	-.46044E+07	-.13430E+08	.00000	.86083E+07	.00000	.00000
1341	-.57680E+07	-.14806E+08	.00000	.97799E+07	.00000	.00000
1342	.33052E+07	-.62988E+07	.00000	.17571E+07	.00000	.00000
1343	.24259E+07	-.69318E+07	.00000	.25010E+07	.00000	.00000
1344	.12942E+07	-.79623E+07	.00000	.35117E+07	.00000	.00000
1345	.38109E+07	-.69901E+07	.00000	.17224E+07	.00000	.00000
1346	.36224E+07	-.72642E+07	.00000	.18731E+07	.00000	.00000
1347	.35272E+07	-.75482E+07	.00000	.19424E+07	.00000	.00000
1348	.23862E+06	-.92923E+07	.00000	.44934E+07	.00000	.00000

1349	-48114.	-.98534E+07	.00000	.47569E+07	.00000	.00000
1350	46328.	-.10409E+08	.00000	.47208E+07	.00000	.00000
1351	.87238E+06	-.10778E+08	.00000	.39685E+07	.00000	.00000
1352	-.14378E+07	-.13050E+08	.00000	.62293E+07	.00000	.00000
1353	-.19476E+08	-.56839E+06	.00000	.95532E+07	.00000	.00000
1354	-.18865E+08	.10481E+07	.00000	.88363E+07	.00000	.00000
1355	-.17781E+08	-.16856E+07	.00000	.96691E+07	.00000	.00000
1356	-.18607E+08	.26367E+07	.00000	.80424E+07	.00000	.00000
1357	-.18498E+08	.34450E+07	.00000	.77699E+07	.00000	.00000
1358	-.18414E+08	.28043E+07	.00000	.80120E+07	.00000	.00000
1359	-.17848E+08	.21045E+07	.00000	.80282E+07	.00000	.00000
1360	-.16855E+08	.15673E+07	.00000	.76995E+07	.00000	.00000
1361	-.16533E+08	.38541E+07	.00000	.62822E+07	.00000	.00000
1362	.70529E+07	-.42863E+07	.00000	-.11332E+07	.00000	.00000
1363	.88059E+07	-.35007E+07	.00000	-.23675E+07	.00000	.00000
1364	.73162E+07	-.44103E+07	.00000	-.11581E+07	.00000	.00000
1365	.62442E+07	-.50826E+07	.00000	-.28468E+06	.00000	.00000
1366	.94718E+07	-.31937E+07	.00000	-.28350E+07	.00000	.00000
1367	.87751E+07	-.37086E+07	.00000	-.22229E+07	.00000	.00000
1368	.54192E+07	-.56540E+07	.00000	.38834E+06	.00000	.00000
1369	.17712E+07	-.74880E+07	.00000	.30729E+07	.00000	.00000
1370	-.16815E+08	.62370E+07	.00000	.50362E+07	.00000	.00000
1371	-.17274E+08	.87605E+07	.00000	.46610E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1372	-.16932E+08	.10194E+08	.00000	.38711E+07	.00000	.00000
1373	-.17251E+08	.70130E+07	.00000	.52321E+07	.00000	.00000
1374	-.17468E+08	.68136E+07	.00000	.57424E+07	.00000	.00000
1375	-.17345E+08	.84308E+07	.00000	.50394E+07	.00000	.00000
1376	-.16964E+08	.99907E+07	.00000	.41762E+07	.00000	.00000
1377	-.16463E+08	.11266E+08	.00000	.33218E+07	.00000	.00000
1378	-.16392E+08	.11384E+08	.00000	.30662E+07	.00000	.00000
1379	-.15813E+08	.12371E+08	.00000	.23081E+07	.00000	.00000
1380	-.15125E+08	.13436E+08	.00000	.13798E+07	.00000	.00000
1381	-.14305E+08	.14695E+08	.00000	.22783E+06	.00000	.00000
1382	-.13439E+08	.15923E+08	.00000	-.97351E+06	.00000	.00000
1383	-.13141E+08	.15939E+08	.00000	-.12344E+07	.00000	.00000
1384	-.11996E+08	.17317E+08	.00000	-.26666E+07	.00000	.00000
1385	-.10809E+08	.18164E+08	.00000	-.37183E+07	.00000	.00000
1386	-.98347E+07	.18576E+08	.00000	-.43459E+07	.00000	.00000
1387	-.93637E+07	.18791E+08	.00000	-.48806E+07	.00000	.00000
1388	-.73979E+07	.19379E+08	.00000	-.63475E+07	.00000	.00000
1389	-.68989E+07	.20099E+08	.00000	-.69831E+07	.00000	.00000
1390	-.93364E+07	.19071E+08	.00000	-.51226E+07	.00000	.00000
1391	-.97085E+07	.19394E+08	.00000	-.50360E+07	.00000	.00000
1392	-.94030E+07	.20132E+08	.00000	-.55077E+07	.00000	.00000
1393	-.11401E+08	.19682E+08	.00000	-.39880E+07	.00000	.00000
1394	-.11491E+08	.20285E+08	.00000	-.43058E+07	.00000	.00000
1395	-.13157E+08	.18783E+08	.00000	-.23776E+07	.00000	.00000
1396	-.13866E+08	.18758E+08	.00000	-.19556E+07	.00000	.00000
1397	-.14827E+08	.17409E+08	.00000	-.52350E+06	.00000	.00000
1398	-.15615E+08	.15989E+08	.00000	.83388E+06	.00000	.00000
1399	-.16283E+08	.14435E+08	.00000	.21228E+07	.00000	.00000
1400	-.16569E+08	.13030E+08	.00000	.30116E+07	.00000	.00000
1401	-.17246E+08	.11618E+08	.00000	.42067E+07	.00000	.00000
1402	-.17741E+08	.83499E+07	.00000	.59614E+07	.00000	.00000
1403	-.17782E+08	.73111E+07	.00000	.62440E+07	.00000	.00000
1404	-.18160E+08	.47870E+07	.00000	.72005E+07	.00000	.00000
1405	-.18255E+08	.46985E+07	.00000	.72367E+07	.00000	.00000
1406	-.18117E+08	.54856E+07	.00000	.68658E+07	.00000	.00000
1407	-.18030E+08	.43671E+07	.00000	.72149E+07	.00000	.00000
1408	-.17509E+08	.37257E+07	.00000	.71273E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1409	.42101E+07	-.82120E+07	.00000	.48448E+06	.00000	.00000
1410	.82895E+07	-.30749E+07	.00000	-.40385E+07	.00000	.00000
1411	.12051E+08	.20212E+07	.00000	-.78974E+07	.00000	.00000
1412	.13998E+08	.41682E+07	.00000	-.95600E+07	.00000	.00000
1413	.12887E+08	.20990E+07	.00000	-.81091E+07	.00000	.00000
1414	.16633E+08	.63775E+07	.00000	-.11560E+08	.00000	.00000
1415	.19871E+08	.95741E+07	.00000	-.14600E+08	.00000	.00000
1416	.23131E+08	.12679E+08	.00000	-.17653E+08	.00000	.00000
1417	.16382E+08	.55180E+07	.00000	-.11019E+08	.00000	.00000
1418	.16861E+08	.51064E+07	.00000	-.10975E+08	.00000	.00000

1419	.18728E+08	.67929E+07	.00000	-.12583E+08	.00000	.00000
1420	.17771E+08	.52990E+07	.00000	-.11382E+08	.00000	.00000
1421	.16772E+08	.39132E+07	.00000	-.10179E+08	.00000	.00000
1422	.17214E+08	.42926E+07	.00000	-.10513E+08	.00000	.00000
1423	.15183E+08	.19171E+07	.00000	-.83529E+07	.00000	.00000
1424	.15110E+08	.17670E+07	.00000	-.81730E+07	.00000	.00000
1425	.15209E+08	.18716E+07	.00000	-.82250E+07	.00000	.00000
1426	.13188E+08	-.25060E+06	.00000	-.61536E+07	.00000	.00000
1427	.13630E+08	.18464E+06	.00000	-.65720E+07	.00000	.00000
1428	.13982E+08	.56014E+06	.00000	-.69467E+07	.00000	.00000
1429	.14572E+08	.12403E+07	.00000	-.76073E+07	.00000	.00000
1430	.15945E+08	.29816E+07	.00000	-.91585E+07	.00000	.00000
1431	.15137E+08	.19909E+07	.00000	-.82971E+07	.00000	.00000
1432	.16569E+08	.42424E+07	.00000	-.10147E+08	.00000	.00000
1433	.17514E+08	.65325E+07	.00000	-.11792E+08	.00000	.00000
1434	.17271E+08	.65582E+07	.00000	-.11715E+08	.00000	.00000
1435	.16428E+08	.45294E+07	.00000	-.10303E+08	.00000	.00000
1436	.16166E+08	.42939E+07	.00000	-.10106E+08	.00000	.00000
1437	.15681E+08	.33880E+07	.00000	-.95070E+07	.00000	.00000
1438	.15565E+08	.34410E+07	.00000	-.95626E+07	.00000	.00000
1439	.15446E+08	.35945E+07	.00000	-.96405E+07	.00000	.00000
1440	.14968E+08	.20024E+07	.00000	-.88469E+07	.00000	.00000
1441	.14878E+08	.30887E+07	.00000	-.92901E+07	.00000	.00000
1442	.14616E+08	.19857E+07	.00000	-.88306E+07	.00000	.00000
1443	.14439E+08	.64877E+06	.00000	-.84395E+07	.00000	.00000
1444	.14393E+08	-.53551E+06	.00000	-.82365E+07	.00000	.00000
1445	.16576E+08	.45048E+07	.00000	-.10321E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1446	.15653E+08	.28870E+07	.00000	-.90731E+07	.00000	.00000
1447	.15704E+08	.30981E+07	.00000	-.92563E+07	.00000	.00000
1448	.15245E+08	.23651E+07	.00000	-.87666E+07	.00000	.00000
1449	.14896E+08	.17550E+07	.00000	-.84350E+07	.00000	.00000
1450	.14947E+08	.18248E+07	.00000	-.85813E+07	.00000	.00000
1451	.14974E+08	.19078E+07	.00000	-.87270E+07	.00000	.00000
1452	.14579E+08	.80259E+06	.00000	-.82471E+07	.00000	.00000
1453	.14833E+08	.16829E+07	.00000	-.87498E+07	.00000	.00000
1454	.14348E+08	-.56984E+06	.00000	-.81094E+07	.00000	.00000
1455	.14182E+08	-.11817E+07	.00000	-.79714E+07	.00000	.00000
1456	.13914E+08	-.13481E+07	.00000	-.77502E+07	.00000	.00000
1457	.13606E+08	-.16194E+07	.00000	-.76336E+07	.00000	.00000
1458	.13154E+08	-.17754E+07	.00000	-.75788E+07	.00000	.00000
1459	.12338E+08	-.16473E+07	.00000	-.72811E+07	.00000	.00000
1460	.11313E+08	-.14174E+07	.00000	-.69945E+07	.00000	.00000
1461	.10027E+08	-.11255E+07	.00000	-.64344E+07	.00000	.00000
1462	.87805E+07	-.14583E+06	.00000	-.65732E+07	.00000	.00000
1463	.69205E+07	-.31492E+06	.00000	-.48960E+07	.00000	.00000
1464	.63262E+07	-.88768E+06	.00000	-.39192E+07	.00000	.00000
1465	.68286E+07	-.15303E+07	.00000	-.36499E+07	.00000	.00000
1466	.69523E+07	-.19347E+07	.00000	-.33233E+07	.00000	.00000
1467	.87380E+07	-.20775E+07	.00000	-.41759E+07	.00000	.00000
1468	.10479E+08	-.19151E+07	.00000	-.51028E+07	.00000	.00000
1469	.98262E+07	-.22476E+07	.00000	-.42876E+07	.00000	.00000
1470	.93411E+07	-.25995E+07	.00000	-.36032E+07	.00000	.00000
1471	.10077E+08	-.24266E+07	.00000	-.39012E+07	.00000	.00000
1472	.96481E+07	-.27516E+07	.00000	-.33660E+07	.00000	.00000
1473	.90949E+07	-.31836E+07	.00000	-.27691E+07	.00000	.00000
1474	.10491E+08	-.24268E+07	.00000	-.37820E+07	.00000	.00000
1475	.11731E+08	-.14905E+07	.00000	-.49008E+07	.00000	.00000
1476	.13090E+08	-.34088E+06	.00000	-.61068E+07	.00000	.00000
1477	.11911E+08	-.13756E+07	.00000	-.49534E+07	.00000	.00000
1478	.61583E+07	-.59327E+07	.00000	-.14020E+07	.00000	.00000
1479	.42447E+07	-.65948E+07	.00000	.13656E+07	.00000	.00000
1480	.67693E+07	-.52033E+07	.00000	-.59523E+06	.00000	.00000
1481	.65209E+07	-.54980E+07	.00000	-.43007E+06	.00000	.00000
1482	.67313E+07	-.54552E+07	.00000	-.67936E+06	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1483	.69628E+07	-.53631E+07	.00000	-.10188E+07	.00000	.00000
1484	.34842E+07	-.78357E+07	.00000	.19068E+07	.00000	.00000
1485	.37406E+07	-.79271E+07	.00000	.15502E+07	.00000	.00000
1486	.45371E+07	-.75057E+07	.00000	.52985E+06	.00000	.00000
1487	.11711E+08	-.15644E+07	.00000	-.47460E+07	.00000	.00000
1488	.11032E+08	-.21239E+07	.00000	-.41421E+07	.00000	.00000

1489	.81276E+07	-.41753E+07	.00000	-.16831E+07	.00000	.00000
1490	-.17240E+08	.53313E+07	.00000	.61600E+07	.00000	.00000
1491	-.17723E+08	.56070E+07	.00000	.65112E+07	.00000	.00000
1492	-.17540E+08	.77333E+07	.00000	.55795E+07	.00000	.00000
1493	-.17112E+08	.96600E+07	.00000	.45450E+07	.00000	.00000
1494	-.16475E+08	.11375E+08	.00000	.33808E+07	.00000	.00000
1495	-.16067E+08	.12263E+08	.00000	.27141E+07	.00000	.00000
1496	-.15966E+08	.12267E+08	.00000	.25687E+07	.00000	.00000
1497	-.15484E+08	.13196E+08	.00000	.18399E+07	.00000	.00000
1498	-.14859E+08	.14335E+08	.00000	.87788E+06	.00000	.00000
1499	-.13910E+08	.15678E+08	.00000	-.46257E+06	.00000	.00000
1500	-.12473E+08	.17134E+08	.00000	-.22282E+07	.00000	.00000
1501	-.10719E+08	.18419E+08	.00000	-.39876E+07	.00000	.00000
1502	-.11371E+08	.18275E+08	.00000	-.34959E+07	.00000	.00000
1503	-.11189E+08	.18803E+08	.00000	-.37905E+07	.00000	.00000
1504	-.11574E+08	.18913E+08	.00000	-.35347E+07	.00000	.00000
1505	-.12955E+08	.18314E+08	.00000	-.22403E+07	.00000	.00000
1506	-.14310E+08	.17412E+08	.00000	-.82719E+06	.00000	.00000
1507	-.15047E+08	.16311E+08	.00000	.26615E+06	.00000	.00000
1508	-.15739E+08	.15107E+08	.00000	.13899E+07	.00000	.00000
1509	-.17035E+08	.11241E+08	.00000	.41323E+07	.00000	.00000
1510	-.17432E+08	.98958E+07	.00000	.50457E+07	.00000	.00000
1511	-.17533E+08	.88674E+07	.00000	.54535E+07	.00000	.00000
1512	-.17872E+08	.67520E+07	.00000	.64004E+07	.00000	.00000
1513	-.18000E+08	.61359E+07	.00000	.66138E+07	.00000	.00000
1514	-.17673E+08	.78326E+07	.00000	.57868E+07	.00000	.00000
1515	-.17377E+08	.90380E+07	.00000	.50893E+07	.00000	.00000
1516	-.17823E+08	.67662E+07	.00000	.62009E+07	.00000	.00000
1517	-.16649E+08	.11214E+08	.00000	.36531E+07	.00000	.00000
1518	-.15725E+08	.12908E+08	.00000	.21771E+07	.00000	.00000
1519	-.15624E+08	.13253E+08	.00000	.19806E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1520	-.14768E+08	.14816E+08	.00000	.64002E+06	.00000	.00000
1521	-.14038E+08	.15755E+08	.00000	-.36576E+06	.00000	.00000
1522	-.13071E+08	.16840E+08	.00000	-.16074E+07	.00000	.00000
1523	-.12100E+08	.17953E+08	.00000	-.27956E+07	.00000	.00000
1524	-.12929E+08	.17638E+08	.00000	-.19909E+07	.00000	.00000
1525	-.14144E+08	.16462E+08	.00000	-.51875E+06	.00000	.00000
1526	-.14118E+08	.17034E+08	.00000	-.77948E+06	.00000	.00000
1527	-.14970E+08	.15900E+08	.00000	.41499E+06	.00000	.00000
1528	-.15749E+08	.14680E+08	.00000	.15953E+07	.00000	.00000
1529	-.16264E+08	.13052E+08	.00000	.27178E+07	.00000	.00000
1530	-.16707E+08	.11924E+08	.00000	.35512E+07	.00000	.00000
1531	-.17253E+08	.99618E+07	.00000	.47708E+07	.00000	.00000
1532	-.17734E+08	.75915E+07	.00000	.59543E+07	.00000	.00000
1533	-.17422E+08	.90931E+07	.00000	.51843E+07	.00000	.00000
1534	-.17100E+08	.10208E+08	.00000	.44813E+07	.00000	.00000
1535	-.16562E+08	.11682E+08	.00000	.34512E+07	.00000	.00000
1536	-.16007E+08	.12845E+08	.00000	.25048E+07	.00000	.00000
1537	-.15415E+08	.13871E+08	.00000	.15830E+07	.00000	.00000
1538	-.15260E+08	.14493E+08	.00000	.12280E+07	.00000	.00000
1539	-.14471E+08	.15604E+08	.00000	92189.	.00000	.00000
1540	-.13659E+08	.16469E+08	.00000	-.95692E+06	.00000	.00000
1541	-.15032E+08	.15298E+08	.00000	.71688E+06	.00000	.00000
1542	-.15710E+08	.14159E+08	.00000	.17764E+07	.00000	.00000
1543	-.15912E+08	.13330E+08	.00000	.22605E+07	.00000	.00000
1544	-.16410E+08	.12304E+08	.00000	.31017E+07	.00000	.00000
1545	-.16903E+08	.11061E+08	.00000	.40318E+07	.00000	.00000
1546	.47571E+07	-.61569E+07	.00000	.94457E+06	.00000	.00000
1547	.74420E+07	-.46842E+07	.00000	-.11287E+07	.00000	.00000
1548	.97974E+07	-.30894E+07	.00000	-.31018E+07	.00000	.00000
1549	.92310E+07	-.35727E+07	.00000	-.26634E+07	.00000	.00000
1550	.99019E+07	-.30439E+07	.00000	-.33808E+07	.00000	.00000
1551	.10620E+08	-.23379E+07	.00000	-.42366E+07	.00000	.00000
1552	.97617E+07	-.29120E+07	.00000	-.37884E+07	.00000	.00000
1553	.68624E+07	-.54372E+07	.00000	-.11963E+07	.00000	.00000
1554	.71740E+07	-.50565E+07	.00000	-.18760E+07	.00000	.00000
1555	.14525E+08	.24179E+06	.00000	-.83172E+07	.00000	.00000
1556	.14671E+08	.97970E+06	.00000	-.85151E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1557	.14405E+08	-.10057E+06	.00000	-.81279E+07	.00000	.00000
1558	.14426E+08	.12896E+06	.00000	-.81056E+07	.00000	.00000

1559	.14000E+08	-.74872E+06	.00000	-.77243E+07	.00000	.00000
1560	.14202E+08	-.71682E+06	.00000	-.79179E+07	.00000	.00000
1561	.14524E+08	.11879E+07	.00000	-.79180E+07	.00000	.00000
1562	.14282E+08	.74867E+06	.00000	-.77324E+07	.00000	.00000
1563	.14124E+08	.37571E+06	.00000	-.76179E+07	.00000	.00000
1564	.14408E+08	.61924E+06	.00000	-.79926E+07	.00000	.00000
1565	.14159E+08	-.11581E+06	.00000	-.77968E+07	.00000	.00000
1566	.13593E+08	-.13028E+07	.00000	-.75185E+07	.00000	.00000
1567	.13270E+08	-.16178E+07	.00000	-.74737E+07	.00000	.00000
1568	.11765E+08	-.15775E+07	.00000	-.68321E+07	.00000	.00000
1569	.10966E+08	-.15123E+07	.00000	-.64468E+07	.00000	.00000
1570	.14970E+08	.18794E+07	.00000	-.83376E+07	.00000	.00000
1571	.14091E+08	.64722E+06	.00000	-.73492E+07	.00000	.00000
1572	.13789E+08	.17248E+06	.00000	-.71708E+07	.00000	.00000
1573	.13271E+08	-.46050E+06	.00000	-.67642E+07	.00000	.00000
1574	.13396E+08	-.55189E+06	.00000	-.70198E+07	.00000	.00000
1575	.13790E+08	-.36596E+06	.00000	-.74160E+07	.00000	.00000
1576	.13592E+08	-.88831E+06	.00000	-.73775E+07	.00000	.00000
1577	.12682E+08	-.15997E+07	.00000	-.71530E+07	.00000	.00000
1578	.11976E+08	-.15916E+07	.00000	-.67160E+07	.00000	.00000
1579	.84731E+07	-.75376E+06	.00000	-.56807E+07	.00000	.00000
1580	.80095E+07	-.12938E+07	.00000	-.47210E+07	.00000	.00000
1581	.84622E+07	-.17946E+07	.00000	-.44066E+07	.00000	.00000
1582	.14658E+08	.33098E+07	.00000	-.92602E+07	.00000	.00000
1583	.14599E+08	.23541E+07	.00000	-.86448E+07	.00000	.00000
1584	.11216E+08	7907.6	.00000	-.64604E+07	.00000	.00000
1585	.12731E+08	.88810E+06	.00000	-.72883E+07	.00000	.00000
1586	.12660E+08	38488.	.00000	-.66003E+07	.00000	.00000
1587	.16396E+08	.39342E+07	.00000	-.10133E+08	.00000	.00000
1588	.15816E+08	.29351E+07	.00000	-.92930E+07	.00000	.00000
1589	.15412E+08	.23430E+07	.00000	-.87547E+07	.00000	.00000
1590	.12797E+08	-.51797E+06	.00000	-.59924E+07	.00000	.00000
1591	.12343E+08	-.10187E+07	.00000	-.54608E+07	.00000	.00000
1592	.12663E+08	-.71619E+06	.00000	-.56833E+07	.00000	.00000
1593	.91871E+07	-.24063E+07	.00000	-.44835E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1594	.15486E+08	.25513E+07	.00000	-.87836E+07	.00000	.00000
1595	.14828E+08	.16409E+07	.00000	-.80779E+07	.00000	.00000
1596	.13840E+08	.41477E+06	.00000	-.69271E+07	.00000	.00000
1597	.97620E+07	-.14147E+07	.00000	-.57807E+07	.00000	.00000
1598	.10101E+08	-.18625E+07	.00000	-.51480E+07	.00000	.00000
1599	.11027E+08	-.18200E+07	.00000	-.52394E+07	.00000	.00000
1600	.10516E+08	-.20876E+07	.00000	-.45804E+07	.00000	.00000
1601	.11233E+08	-.17916E+07	.00000	-.49264E+07	.00000	.00000
1602	.11431E+08	-.16970E+07	.00000	-.48801E+07	.00000	.00000
1603	.11132E+08	-.19178E+07	.00000	-.44989E+07	.00000	.00000
1604	.10720E+08	-.22084E+07	.00000	-.40774E+07	.00000	.00000
1605	.12361E+08	-.10068E+07	.00000	-.55301E+07	.00000	.00000
1606	.10516E+08	-.25547E+07	.00000	-.36897E+07	.00000	.00000
1607	.13058E+08	-.13736E+07	.00000	-.71574E+07	.00000	.00000
1608	.11001E+08	-.16295E+07	.00000	-.61177E+07	.00000	.00000
1609	.98439E+07	-.16895E+07	.00000	-.53626E+07	.00000	.00000
1610	.11359E+08	-.16615E+07	.00000	-.60092E+07	.00000	.00000
1611	.11819E+08	-.15535E+07	.00000	-.60709E+07	.00000	.00000
1612	.12151E+08	-.13773E+07	.00000	-.61192E+07	.00000	.00000
1613	.11660E+08	-.15671E+07	.00000	-.55172E+07	.00000	.00000
1614	.12315E+08	-.11422E+07	.00000	-.58773E+07	.00000	.00000
1615	.12947E+08	-.58498E+06	.00000	-.62824E+07	.00000	.00000
1616	.12637E+08	-.78804E+06	.00000	-.58813E+07	.00000	.00000
1617	.13861E+08	.44078E+06	.00000	-.70347E+07	.00000	.00000
1618	.12696E+08	-.10029E+07	.00000	-.63949E+07	.00000	.00000
1619	.12846E+08	-.10356E+07	.00000	-.66662E+07	.00000	.00000
1620	.12916E+08	-.11535E+07	.00000	-.68351E+07	.00000	.00000
1621	.12343E+08	-.14933E+07	.00000	-.66769E+07	.00000	.00000
1622	.10304E+08	-.20082E+07	.00000	-.47569E+07	.00000	.00000
1623	.13469E+08	.25966E+06	.00000	-.67929E+07	.00000	.00000
1624	.14394E+08	.15925E+07	.00000	-.80433E+07	.00000	.00000
1625	.44992E+06	-.86067E+06	.00000	.16782E+06	.00000	.00000
1626	.18354E+08	.25407E+08	.00000	-.22213E+08	.00000	.00000
1627	.25864E+08	.20765E+08	.00000	-.23213E+08	.00000	.00000
1628	.24276E+08	.18668E+08	.00000	-.21348E+08	.00000	.00000
1629	.10306E+08	.43328E+07	.00000	-.72866E+07	.00000	.00000
1630	-.10561E+07	.57046E+06	.00000	-.20819E+06	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1631	49433.	.42879E+06	.00000	-49752.	.00000	.00000
1632	-.20220E+07	-.36573E+07	.00000	.28824E+07	.00000	.00000
1633	-.17527E+08	-.18166E+08	.00000	.17871E+08	.00000	.00000
1634	-.73860E+07	-.18204E+07	.00000	.44272E+07	.00000	.00000
1635	.57839E+06	-.18835E+06	.00000	98301.	.00000	.00000
1636	-38007.	-.73940E+06	.00000	-.49608E+06	.00000	.00000
1637	-.45689E+07	-.27387E+07	.00000	-.23344E+07	.00000	.00000
1638	-.79749E+07	-.34182E+07	.00000	-.47883E+07	.00000	.00000
1639	-.17078E+08	.30145E+08	.00000	.66615E+07	.00000	.00000
1640	-.73064E+07	.27922E+08	.00000	.97273E+07	.00000	.00000
1641	-.10198E+07	.23552E+08	.00000	.93299E+07	.00000	.00000
1642	.37947E+07	.13087E+08	.00000	.64372E+07	.00000	.00000
1643	.12099E+07	.33102E+07	.00000	.16843E+07	.00000	.00000
1644	-.10198E+06	.14597E+06	.00000	.54327E+06	.00000	.00000
1645	-.28395E+08	.69283E+07	.00000	.87093E+07	.00000	.00000
1646	-.75781E+07	.12354E+06	.00000	.16411E+08	.00000	.00000
1647	.17597E+08	.67915E+07	.00000	.95487E+07	.00000	.00000
1648	.26683E+08	.10098E+08	.00000	.19155E+07	.00000	.00000
1649	.16043E+08	-.15149E+06	.00000	-.65910E+07	.00000	.00000
1650	.40888E+07	-.41159E+07	.00000	-.22196E+08	.00000	.00000
1651	.20039E+08	.52063E+07	.00000	-.12393E+08	.00000	.00000
1652	.13852E+08	.12744E+08	.00000	-.13781E+08	.00000	.00000
1653	.20736E+07	.12219E+08	.00000	-.91584E+07	.00000	.00000
1654	-.15650E+08	-.19442E+07	.00000	.20231E+07	.00000	.00000
1655	-.43418E+07	-.65758E+07	.00000	.82777E+07	.00000	.00000
1656	.15195E+08	-.42255E+07	.00000	-.96565E+07	.00000	.00000
1657	.27315E+08	-.21708E+06	.00000	-.64267E+07	.00000	.00000
1658	.97566E+07	-.36999E+07	.00000	-.13321E+08	.00000	.00000
1659	.12291E+08	-.25808E+07	.00000	-.89584E+07	.00000	.00000
1660	.13345E+08	.28824E+07	.00000	-.77010E+07	.00000	.00000
1661	-.19251E+08	.10494E+08	.00000	.81483E+06	.00000	.00000
1662	-.16462E+08	.11388E+08	.00000	.28956E+07	.00000	.00000
1663	.91336E+07	.17936E+07	.00000	-.84089E+07	.00000	.00000
1664	.10162E+08	.62547E+07	.00000	-.10752E+08	.00000	.00000
1665	.13895E+08	-.26875E+07	.00000	-.78412E+07	.00000	.00000
1666	.14756E+08	-.21871E+07	.00000	-.88063E+07	.00000	.00000
1667	.59895E+07	.50600E+06	.00000	-.48105E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1668	.14634E+08	.85875E+06	.00000	-.83618E+07	.00000	.00000
1669	.11848E+08	-.14214E+07	.00000	-.53244E+07	.00000	.00000
1670	-.16093E+08	.12414E+08	.00000	.27208E+07	.00000	.00000
1671	.15703E+08	.32108E+07	.00000	-.93575E+07	.00000	.00000
1672	.14722E+08	.15021E+07	.00000	-.79035E+07	.00000	.00000
1673	.33528E+07	.26553E+07	.00000	-.27302E+07	.00000	.00000
1674	-.19497E+08	.10034E+08	.00000	.63533E+07	.00000	.00000
1675	.10572E+06	.18292E+07	.00000	.61725E+06	.00000	.00000
1676	-.11339E+08	.18235E+08	.00000	-.26373E+07	.00000	.00000
1677	-.18403E+08	.17921E+07	.00000	.97523E+07	.00000	.00000
1678	-.10713E+08	.18758E+08	.00000	-.29040E+07	.00000	.00000
1679	-.93691E+07	.18865E+08	.00000	-.30434E+07	.00000	.00000
1680	-.17642E+08	.81147E+07	.00000	.57338E+07	.00000	.00000
1681	-.94149E+07	.18646E+08	.00000	-.40204E+07	.00000	.00000
1682	-.10318E+08	.18477E+08	.00000	-.42102E+07	.00000	.00000
1683	-.71886E+06	.52163E+06	.00000	-.14655E+06	.00000	.00000
1684	-.17353E+08	.76224E+07	.00000	.51883E+07	.00000	.00000
1685	-.74452E+06	73127.	.00000	-.38347E+06	.00000	.00000
1686	-.75435E+06	-.24547E+06	.00000	-.58397E+06	.00000	.00000
1687	-.52377E+06	-.52193E+06	.00000	-.63496E+06	.00000	.00000
1688	-.23668E+07	.14124E+08	.00000	.40245E+07	.00000	.00000
1689	-.12600E+07	.21950E+06	.00000	-.14798E+06	.00000	.00000
1690	-.62287E+07	.18484E+08	.00000	-.63425E+07	.00000	.00000
1691	-.62727E+07	.23199E+08	.00000	-.93292E+07	.00000	.00000
1692	-.18262E+08	.10578E+06	.00000	.90440E+07	.00000	.00000
1693	-.17351E+08	-.10374E+06	.00000	.87200E+07	.00000	.00000
1694	.26415E+08	.17108E+08	.00000	-.22331E+08	.00000	.00000
1695	.72024E+06	-.10026E+06	.00000	.32545E+06	.00000	.00000
1696	.98358E+06	-27900.	.00000	-.52865E+06	.00000	.00000
1697	-.19599E+08	-.38254E+07	.00000	.11276E+08	.00000	.00000
1698	.59408E+06	-.77794E+06	.00000	-.12509E+06	.00000	.00000
1699	-.96843E+06	.26252E+07	.00000	-.44958E+06	.00000	.00000
1700	.30940E+07	.18688E+08	.00000	-.11322E+08	.00000	.00000
1701	.11195E+07	.16978E+08	.00000	-.94514E+07	.00000	.00000
1702	.11897E+08	.21404E+08	.00000	-.16965E+08	.00000	.00000
1703	.27615E+08	.29251E+08	.00000	-.29019E+08	.00000	.00000
1704	.15878E+08	.27299E+08	.00000	-.22814E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1705	.14412E+08	.38862E+07	.00000	-.95264E+07	.00000	.00000
1706	.54475E+07	-.11847E+07	.00000	.16456E+07	.00000	.00000
1707	-.12310E+08	-.31024E+07	.00000	.75250E+07	.00000	.00000
1708	-.16681E+08	-.24951E+07	.00000	.94892E+07	.00000	.00000
1709	-.21677E+08	-.13228E+08	.00000	.17134E+08	.00000	.00000
1710	.29318E+08	.20860E+08	.00000	-.25333E+08	.00000	.00000
1711	.14548E+08	.94833E+07	.00000	-.11933E+08	.00000	.00000
1712	.12716E+08	.55180E+07	.00000	-.91573E+07	.00000	.00000
1713	.14234E+08	.56179E+07	.00000	-.99880E+07	.00000	.00000
1714	.13443E+08	.62747E+07	.00000	-.98794E+07	.00000	.00000
1715	.58151E+07	-.53660E+06	.00000	-.11559E+07	.00000	.00000
1716	.24693E+07	.16254E+07	.00000	-.17368E+07	.00000	.00000
1717	.97145E+06	.10258E+07	.00000	-.95286E+06	.00000	.00000
1718	.40870E+07	-.11803E+07	.00000	-.20670E+07	.00000	.00000
1719	-.14681E+08	-.16290E+08	.00000	.19044E+08	.00000	.00000
1720	-.23292E+08	-.14962E+08	.00000	.18846E+08	.00000	.00000
1721	.32747E+06	-.61129E+07	.00000	.30756E+07	.00000	.00000
1722	.19513E+08	.11757E+08	.00000	-.15448E+08	.00000	.00000
1723	-.10893E+08	-.20189E+08	.00000	.15930E+08	.00000	.00000
1724	-.34508E+07	-.14788E+08	.00000	.82689E+07	.00000	.00000
1725	.28546E+08	.19815E+08	.00000	-.23852E+08	.00000	.00000
1726	.25656E+08	.15777E+08	.00000	-.20307E+08	.00000	.00000
1727	.18742E+08	.90515E+07	.00000	-.13666E+08	.00000	.00000
1728	.12623E+08	-.40303E+06	.00000	-.61792E+07	.00000	.00000
1729	.11238E+08	-.15890E+07	.00000	-.50509E+07	.00000	.00000
1730	.73664E+07	-.46538E+07	.00000	-.25001E+07	.00000	.00000
1731	.17117E+08	.42408E+07	.00000	-.10471E+08	.00000	.00000
1732	-.73821E+06	-.90140E+07	.00000	.50070E+07	.00000	.00000
1733	.10113E+08	-.27365E+07	.00000	-.33934E+07	.00000	.00000
1734	.16411E+08	.37931E+07	.00000	-.98114E+07	.00000	.00000
1735	.57973E+07	-.58492E+07	.00000	.17039E+06	.00000	.00000
1736	.11629E+08	-.16472E+07	.00000	-.47468E+07	.00000	.00000
1737	.15354E+08	.21795E+07	.00000	-.86031E+07	.00000	.00000
1738	.14285E+08	.11735E+07	.00000	-.76717E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
MINIMUM VALUES						
NODE	381	244	1	60	1	1
VALUE	-.36694E+08	-.28239E+08	.00000	-.35443E+08	.00000	.00000
MAXIMUM VALUES						
NODE	439	359	1	246	1	1
VALUE	.41143E+08	.35901E+08	.00000	.29740E+08	.00000	.00000

***** ESTIMATED BOUNDS CONSIDERING THE EFFECT OF DISCRETIZATION ERROR *****

MINIMUM VALUES						
NODE	381	244	375	401	375	375
VALUE	-.49772E+08	-.28323E+08	.00000	-.37495E+08	.00000	.00000
MAXIMUM VALUES						
NODE	439	390	375	375	375	375
VALUE	.46648E+08	.42457E+08	.00000	.41661E+08	.00000	.00000

****

```
PRINT F    REACTION SOLUTIONS PER NODE

 ***** POST1 TOTAL REACTION SOLUTION LISTING *****

 LOAD STEP=     1  SUBSTEP=     1
  TIME=    1.0000      LOAD CASE=   0

 THE FOLLOWING X,Y,Z SOLUTIONS ARE IN GLOBAL COORDINATES

   NODE       FX          FY
      5   920.57      966.77
      6   359.99      221.37
      7   6.9265      7.8544
      8   200.42      407.01
    317   1904.9      1783.5
    318   993.35      866.22
    319   1870.6      1481.7
    320   945.68      682.59
    321   1781.6      1250.4
    322   828.63      575.25
    323   1535.6      914.46
    324   699.09      441.27
    325   1212.7      700.97
    326   517.69      319.11
    327   896.06      499.02
    328   608.18      352.15
    329   236.09      137.06
    330   370.77      216.77
    331   142.81      78.206
    332   218.66      116.88
    333   81.323      36.425
    334   119.73      49.672
    335   44.075      10.407
    336   54.932      14.523
    337   22.996      3.6845
    338   14.823      7.3329
    339   2.1958      29.360
    340   1.1643      27.564
    341   4.3938      65.133
    342   11.327      56.311
    343   41.580      145.38
    344   32.867      95.705
    345   108.17      255.19
    346   72.089      167.43
    347   206.72      422.63
    348   124.51      271.52
    349   334.32      669.04

 ***** POST1 TOTAL REACTION SOLUTION LISTING *****

 LOAD STEP=     1  SUBSTEP=     1
  TIME=    1.0000      LOAD CASE=   0

 THE FOLLOWING X,Y,Z SOLUTIONS ARE IN GLOBAL COORDINATES

   NODE       FX          FY
    350   489.51      981.88
    351   297.16      581.36
    352   699.92      1352.0
    353   408.27      764.43
    354   934.72      1658.8
    355   534.99      903.17
    356   1198.2      1898.3
    357   685.70      993.60
    358   1466.9      1992.8
    359   825.38      1018.0
    360   1712.4      1928.9

TOTAL VALUES
VALUE    26781.      28419.
```

Input listing for the finite element analysis of the follower link

PRINT S NODAL SOLUTION PER NODE

*** WARNING *** CP= 2.433 TIME= 08:59:07
The selected element set contains mixed materials.
This could invalidate error estimation.

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1	-.13544E+06	-.13356E+06	.00000	-.13450E+06	.00000	.00000
2	58027.	48019.	.00000	-52786.	.00000	.00000
3	-.15156E+06	-.14945E+06	.00000	-.15050E+06	.00000	.00000
4	.28921E+06	.11347E+08	.00000	.10914E+06	.00000	.00000
5	-.24940E+06	-.22396E+06	.00000	.23625E+06	.00000	.00000
6	.12077E+09	.91392E+08	.00000	-.10261E+09	.00000	.00000
7	171.40	.10198E+08	.00000	45516.	.00000	.00000
8	-.98566E+08	-.15432E+09	.00000	-.82851E+07	.00000	.00000
9	-.12183E+08	-.13735E+09	.00000	.41103E+08	.00000	.00000
10	-.73193E+08	-.20752E+09	.00000	.58387E+08	.00000	.00000
11	-.57201E+07	-.27904E+07	.00000	-.91265E+07	.00000	.00000
12	-.48354E+08	-.17447E+09	.00000	-.32771E+07	.00000	.00000
13	-.11106E+08	.16896E+06	.00000	-.38934E+07	.00000	.00000
14	-.11964E+07	.29654E+09	.00000	-.50294E+08	.00000	.00000
15	.87414E+07	.25631E+07	.00000	.19576E+07	.00000	.00000
16	.96323E+06	.28986E+07	.00000	.13094E+08	.00000	.00000
17	-.18836E+07	-.30581E+06	.00000	.80688E+07	.00000	.00000
18	.63239E+07	.26040E+08	.00000	-.10888E+08	.00000	.00000
19	-.45342E+07	-.23582E+07	.00000	.60999E+07	.00000	.00000
20	.12309E+08	.81949E+07	.00000	-.53551E+07	.00000	.00000
21	.44317E+07	-.13868E+07	.00000	-.85444E+07	.00000	.00000
22	.31046E+07	-.78932E+07	.00000	.24413E+07	.00000	.00000
23	.14390E+08	.14564E+09	.00000	-.45259E+08	.00000	.00000
24	.18663E+08	.30423E+08	.00000	.23828E+08	.00000	.00000
26	-66737.	.11466E+07	.00000	.26779E+06	.00000	.00000
28	-53846.	.47221E+07	.00000	.47250E+06	.00000	.00000
30	31662.	.88645E+07	.00000	.44713E+06	.00000	.00000
32	.18019E+06	.10498E+08	.00000	-.12156E+06	.00000	.00000
34	.20082E+06	.74488E+07	.00000	-.74695E+06	.00000	.00000
36	-29497.	.14892E+07	.00000	-.78175E+06	.00000	.00000
38	-.15635E+06	-.31588E+07	.00000	-.42987E+06	.00000	.00000
40	-.10638E+06	-.45507E+07	.00000	.29556E+06	.00000	.00000
42	-.13865E+06	-.30862E+07	.00000	.68928E+06	.00000	.00000
44	77500.	-.11006E+07	.00000	.51320E+06	.00000	.00000
47	-.12934E+07	43553.	.00000	.36034E+06	.00000	.00000
49	-.17755E+07	-44995.	.00000	-.12103E+06	.00000	.00000
51	.41004E+07	-.13900E+06	.00000	-.57318E+06	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
53	.11756E+08	23871.	.00000	-.24776E+06	.00000	.00000
55	.18522E+08	62672.	.00000	-.28454E+06	.00000	.00000
57	.25358E+08	14900.	.00000	-.33280E+06	.00000	.00000
59	.31563E+08	70078.	.00000	-.34841E+06	.00000	.00000
61	.36989E+08	.15226E+06	.00000	-.37061E+06	.00000	.00000
63	.40501E+08	.20934E+06	.00000	-.27040E+06	.00000	.00000
65	.40860E+08	.22755E+06	.00000	-74375.	.00000	.00000
67	.37504E+08	.18827E+06	.00000	.12212E+06	.00000	.00000
69	.30951E+08	.10518E+06	.00000	.27558E+06	.00000	.00000
71	.22650E+08	-23227.	.00000	.35441E+06	.00000	.00000
73	.14393E+08	-77629.	.00000	.33165E+06	.00000	.00000
75	.79107E+07	-46253.	.00000	86883.	.00000	.00000
77	.38862E+07	-49547.	.00000	-41358.	.00000	.00000
79	.13880E+07	-.11276E+06	.00000	69348.	.00000	.00000
81	-60130.	48623.	.00000	-24095.	.00000	.00000
84	.11784E+06	.70638E+07	.00000	-.13819E+06	.00000	.00000
86	56394.	.54146E+07	.00000	-83997.	.00000	.00000
88	1703.7	.35076E+07	.00000	-63275.	.00000	.00000
90	6100.9	.11274E+07	.00000	-44813.	.00000	.00000
92	1180.3	-.28200E+06	.00000	.25918E+06	.00000	.00000
95	.11229E+09	.65316E+08	.00000	-.84505E+08	.00000	.00000
97	.94503E+08	.40048E+08	.00000	-.61176E+08	.00000	.00000
99	.69955E+08	.20169E+08	.00000	-.37775E+08	.00000	.00000
101	.48748E+08	.98968E+07	.00000	-.22106E+08	.00000	.00000
103	.30153E+08	.38706E+07	.00000	-.11275E+08	.00000	.00000

105	.13616E+08	.81301E+06	.00000	-.39145E+07	.00000	.00000
107	.31856E+07	-50654.	.00000	-.58674E+06	.00000	.00000
109	-.38737E+06	-1783.0	.00000	.10465E+06	.00000	.00000
112	.21990E+07	.22274E+07	.00000	-.57488E+07	.00000	.00000
114	-.36289E+07	-.30783E+07	.00000	.39184E+07	.00000	.00000
116	-.26690E+08	-.84411E+07	.00000	.23404E+08	.00000	.00000
119	-.16057E+08	-.13444E+09	.00000	.47627E+08	.00000	.00000
121	-.23440E+08	-.13322E+09	.00000	.56696E+08	.00000	.00000
123	-.34939E+08	-.12984E+09	.00000	.68069E+08	.00000	.00000
125	-.46859E+08	-.12489E+09	.00000	.76923E+08	.00000	.00000
127	-.60546E+08	-.11773E+09	.00000	.84766E+08	.00000	.00000
129	-.75190E+08	-.10857E+09	.00000	.91662E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
131	-.90759E+08	-.96813E+08	.00000	.94314E+08	.00000	.00000
133	-.10728E+09	-.94258E+08	.00000	.10979E+09	.00000	.00000
136	88600.	.94820E+07	.00000	-.84468E+06	.00000	.00000
138	-.58010E+06	.89673E+07	.00000	-.82525E+06	.00000	.00000
140	-.13839E+07	.10938E+08	.00000	-.49820E+06	.00000	.00000
142	-.17675E+07	.14383E+08	.00000	-.95297E+06	.00000	.00000
144	-.18330E+07	.19629E+08	.00000	-.29591E+07	.00000	.00000
146	-.32094E+06	.22318E+08	.00000	-.59438E+07	.00000	.00000
148	.52885E+06	.20593E+08	.00000	-.66031E+07	.00000	.00000
150	.92437E+06	.18598E+08	.00000	-.73001E+07	.00000	.00000
152	.26703E+06	.14245E+08	.00000	-.56659E+07	.00000	.00000
154	-.95427E+06	.13211E+08	.00000	-.38698E+07	.00000	.00000
156	-.28641E+07	.11975E+08	.00000	-.13616E+07	.00000	.00000
158	-.51387E+07	.12139E+08	.00000	.88397E+06	.00000	.00000
160	-.80628E+07	.11533E+08	.00000	.33863E+07	.00000	.00000
162	-.11605E+08	.11252E+08	.00000	.65998E+07	.00000	.00000
164	-.16202E+08	.85637E+07	.00000	.10876E+08	.00000	.00000
166	-.22181E+08	.55149E+06	.00000	.16296E+08	.00000	.00000
168	-.26890E+08	-.97271E+07	.00000	.20447E+08	.00000	.00000
170	-.31994E+08	-.23313E+08	.00000	.24054E+08	.00000	.00000
172	-.43720E+08	-.58821E+08	.00000	.29178E+08	.00000	.00000
175	.93386E+06	.11117E+06	.00000	.42082E+06	.00000	.00000
177	.15990E+07	50749.	.00000	3184.1	.00000	.00000
179	-.20193E+07	52633.	.00000	-.30870E+06	.00000	.00000
181	-.66768E+07	24084.	.00000	-79484.	.00000	.00000
183	-.93825E+07	-5813.2	.00000	31090.	.00000	.00000
185	-.11719E+08	6355.4	.00000	63568.	.00000	.00000
187	-.14775E+08	21082.	.00000	.10515E+06	.00000	.00000
189	-.17322E+08	60007.	.00000	.24422E+06	.00000	.00000
191	-.18763E+08	.38465E+06	.00000	.82949E+06	.00000	.00000
193	-.18035E+08	12528.	.00000	.19299E+07	.00000	.00000
195	-.26288E+08	.10380E+08	.00000	.40452E+07	.00000	.00000
197	-.28470E+08	.12932E+08	.00000	.80618E+07	.00000	.00000
200	26087.	-28757.	.00000	-15949.	.00000	.00000
202	-.11008E+06	.12931E+07	.00000	.12860E+06	.00000	.00000
204	-62654.	.41680E+07	.00000	.21210E+06	.00000	.00000
206	69371.	.84337E+07	.00000	.34675E+06	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
208	37386.	.12423E+08	.00000	.21341E+06	.00000	.00000
210	62280.	.14618E+08	.00000	-2805.4	.00000	.00000
212	2280.9	.14219E+08	.00000	-.16694E+06	.00000	.00000
215	-.77369E+07	-.58139E+07	.00000	-.50670E+07	.00000	.00000
217	-.11406E+08	-.68612E+07	.00000	-.93988E+07	.00000	.00000
219	-.15835E+08	-.10795E+08	.00000	-.13489E+08	.00000	.00000
221	-.19503E+08	-.19279E+08	.00000	-.20292E+08	.00000	.00000
223	-.21489E+08	-.30652E+08	.00000	-.26779E+08	.00000	.00000
225	-.22007E+08	-.45972E+08	.00000	-.33290E+08	.00000	.00000
227	-.21004E+08	-.64839E+08	.00000	-.38731E+08	.00000	.00000
229	-.19538E+08	-.80272E+08	.00000	-.39831E+08	.00000	.00000
231	-.15487E+08	-.10350E+09	.00000	-.43138E+08	.00000	.00000
233	-.10427E+08	-.13093E+09	.00000	-.41797E+08	.00000	.00000
235	-.50032E+07	-.16030E+09	.00000	-.36522E+08	.00000	.00000
237	-7858.4	-.19060E+09	.00000	-.26668E+08	.00000	.00000
239	.35359E+07	-.22062E+09	.00000	-.11972E+08	.00000	.00000
241	.45001E+07	-.24905E+09	.00000	.75781E+07	.00000	.00000
243	.20020E+07	-.27450E+09	.00000	.31533E+08	.00000	.00000
245	-.22129E+07	-.29465E+09	.00000	.52434E+08	.00000	.00000
248	-.22725E+07	-.13778E+06	.00000	37078.	.00000	.00000
250	.35024E+07	.64200E+07	.00000	.45756E+07	.00000	.00000

252	.69616E+07	.14533E+08	.00000	.10082E+08	.00000	.00000
254	.10419E+08	.25241E+08	.00000	.15888E+08	.00000	.00000
256	.12781E+08	.39757E+08	.00000	.21704E+08	.00000	.00000
258	.13664E+08	.58025E+08	.00000	.26870E+08	.00000	.00000
260	.13645E+08	.82655E+08	.00000	.29381E+08	.00000	.00000
262	.10404E+08	.11365E+09	.00000	.30452E+08	.00000	.00000
264	.78362E+07	.14222E+09	.00000	.26801E+08	.00000	.00000
266	.53150E+07	.17232E+09	.00000	.18826E+08	.00000	.00000
268	.39627E+07	.20279E+09	.00000	.61599E+07	.00000	.00000
270	.49085E+07	.23236E+09	.00000	-.11344E+08	.00000	.00000
272	.93868E+07	.25968E+09	.00000	-.33527E+08	.00000	.00000
274	.18629E+08	.28325E+09	.00000	-.58694E+08	.00000	.00000
277	-.41278E+07	.23181E+07	.00000	-.11063E+07	.00000	.00000
280	.11678E+08	.48337E+07	.00000	.34931E+07	.00000	.00000
282	.14975E+08	.51903E+07	.00000	.40263E+07	.00000	.00000
284	.17176E+08	.30309E+07	.00000	.60280E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
286	.15477E+08	.10084E+07	.00000	.98310E+07	.00000	.00000
288	.92420E+07	.11328E+07	.00000	.12990E+08	.00000	.00000
291	-.57365E+07	.42198E+07	.00000	.97424E+07	.00000	.00000
293	-.81298E+07	.33084E+07	.00000	.50834E+07	.00000	.00000
295	-.65428E+07	.46888E+06	.00000	.19101E+07	.00000	.00000
297	-.32936E+07	-.23707E+07	.00000	.17756E+07	.00000	.00000
299	-.10919E+07	-.31292E+07	.00000	.43964E+07	.00000	.00000
302	-.55451E+07	.62739E+07	.00000	.99792E+07	.00000	.00000
304	-.97793E+07	.14780E+08	.00000	.83841E+07	.00000	.00000
306	-.11613E+08	.22662E+08	.00000	.29328E+07	.00000	.00000
308	-.83721E+07	.27864E+08	.00000	-.40696E+07	.00000	.00000
310	-.15230E+07	.29067E+08	.00000	-.98529E+07	.00000	.00000
313	.96337E+07	.21906E+08	.00000	-.82041E+07	.00000	.00000
315	.73874E+07	.17713E+08	.00000	-.57873E+07	.00000	.00000
317	.42718E+07	.12629E+08	.00000	-.46954E+07	.00000	.00000
319	.35988E+07	.66444E+07	.00000	-.38490E+07	.00000	.00000
321	.58881E+07	.25040E+07	.00000	-.13169E+07	.00000	.00000
324	-.50483E+07	.10696E+08	.00000	.36525E+07	.00000	.00000
326	-.14851E+07	.21694E+08	.00000	-.35335E+07	.00000	.00000
328	.57636E+07	.22357E+08	.00000	-.10764E+08	.00000	.00000
330	.13789E+08	.17545E+08	.00000	-.12585E+08	.00000	.00000
332	.17002E+08	.11787E+08	.00000	-.95897E+07	.00000	.00000
335	.14640E+07	.67089E+07	.00000	-.50137E+07	.00000	.00000
337	-.73604E+07	.26552E+07	.00000	-.97970E+07	.00000	.00000
339	-.89975E+07	-.48219E+07	.00000	-.15030E+08	.00000	.00000
341	-.43252E+07	-.10954E+08	.00000	-.15034E+08	.00000	.00000
343	.83039E+06	-.99932E+07	.00000	-.11279E+08	.00000	.00000
346	.82148E+07	.82355E+07	.00000	-.10920E+08	.00000	.00000
348	.14464E+08	.94654E+07	.00000	-.14475E+08	.00000	.00000
350	.20860E+08	.38363E+07	.00000	-.14249E+08	.00000	.00000
352	.22036E+08	-.32931E+07	.00000	-.82278E+07	.00000	.00000
354	.14927E+08	-.71902E+07	.00000	-.86062E+06	.00000	.00000
357	-.70943E+07	-.87299E+07	.00000	.96660E+06	.00000	.00000
359	-.12171E+08	-.11861E+08	.00000	-.27247E+07	.00000	.00000
361	-.11760E+08	-.16727E+08	.00000	-.46339E+07	.00000	.00000
363	-.72514E+07	-.20350E+08	.00000	-.20320E+07	.00000	.00000
365	-.45391E+07	-.15266E+08	.00000	.34321E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
368	-.17239E+07	.10557E+08	.00000	.24689E+06	.00000	.00000
371	.11659E+09	.10956E+09	.00000	-.11061E+09	.00000	.00000
373	.97211E+08	.12372E+09	.00000	-.10826E+09	.00000	.00000
375	.74044E+08	.13504E+09	.00000	-.98756E+08	.00000	.00000
377	.53714E+08	.14374E+09	.00000	-.86510E+08	.00000	.00000
379	.36954E+08	.14995E+09	.00000	-.73227E+08	.00000	.00000
381	.23849E+08	.15253E+09	.00000	-.58817E+08	.00000	.00000
384	-.11190E+08	-.13638E+09	.00000	.38812E+08	.00000	.00000
386	-.10285E+08	-.12918E+09	.00000	.36510E+08	.00000	.00000
388	-.92778E+07	-.12038E+09	.00000	.33306E+08	.00000	.00000
390	-.87957E+07	-.11216E+09	.00000	.31347E+08	.00000	.00000
392	-.85757E+07	-.10669E+09	.00000	.30414E+08	.00000	.00000
394	-.85491E+07	-.10044E+09	.00000	.28385E+08	.00000	.00000
396	-.17904E+07	-.86662E+08	.00000	.18610E+08	.00000	.00000
398	.90435E+07	-.29722E+08	.00000	-.16744E+07	.00000	.00000
401	.11158E+08	.13395E+09	.00000	-.39064E+08	.00000	.00000
403	.10596E+08	.12620E+09	.00000	-.36610E+08	.00000	.00000

405	.10120E+08	.11845E+09	.00000	-.34605E+08	.00000	.00000
407	.96495E+07	.11236E+09	.00000	-.33248E+08	.00000	.00000
409	.94942E+07	.10560E+09	.00000	-.31112E+08	.00000	.00000
411	.86796E+07	.98294E+08	.00000	-.29869E+08	.00000	.00000
413	.64085E+07	.10201E+09	.00000	-.23517E+08	.00000	.00000
415	.11038E+08	.16078E+09	.00000	-.17747E+08	.00000	.00000
418	.93302E+07	-.49097E+08	.00000	.22456E+08	.00000	.00000
419	.41286E+06	-.76001E+08	.00000	.31083E+08	.00000	.00000
420	-.49088E+08	-.52873E+08	.00000	.47735E+07	.00000	.00000
421	-.46941E+08	-.19637E+08	.00000	.14391E+08	.00000	.00000
422	-.36635E+08	-.23781E+07	.00000	.14746E+08	.00000	.00000
423	-.28903E+08	.66359E+07	.00000	.10971E+08	.00000	.00000
424	-.22227E+08	.11163E+08	.00000	.67777E+07	.00000	.00000
425	-.23549E+08	-.33406E+08	.00000	.15072E+08	.00000	.00000
426	-.16281E+08	.12648E+08	.00000	.30183E+07	.00000	.00000
427	-.11172E+08	.12279E+08	.00000	.31954E+06	.00000	.00000
428	-.68890E+07	.10849E+08	.00000	-.89395E+06	.00000	.00000
429	-.41073E+07	.11560E+08	.00000	-.37442E+07	.00000	.00000
430	-.77429E+07	.13975E+08	.00000	-.49742E+07	.00000	.00000
431	-.45135E+07	.12894E+08	.00000	-.58888E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
432	-.30764E+07	.13702E+08	.00000	-.46032E+07	.00000	.00000
433	-.23471E+07	.12732E+08	.00000	-.18291E+07	.00000	.00000
434	-.10190E+07	.81810E+07	.00000	-.93566E+06	.00000	.00000
435	-.11578E+06	.65340E+07	.00000	-.12604E+07	.00000	.00000
436	-.17425E+06	.55426E+07	.00000	-.17029E+07	.00000	.00000
437	73950.	.33442E+07	.00000	-.16112E+07	.00000	.00000
438	.28641E+08	.53981E+08	.00000	-.40587E+08	.00000	.00000
439	.19666E+08	.29967E+08	.00000	-.26336E+08	.00000	.00000
440	.55139E+07	.23530E+08	.00000	-.12861E+08	.00000	.00000
441	-.57907E+08	-.66705E+08	.00000	.27625E+08	.00000	.00000
442	-.34998E+08	-.53916E+08	.00000	.49489E+08	.00000	.00000
443	-.29946E+08	-.50000E+08	.00000	.56649E+08	.00000	.00000
444	.32509E+08	.49886E+08	.00000	-.40297E+08	.00000	.00000
445	-.34007E+08	.10878E+07	.00000	.68070E+07	.00000	.00000
446	-.29333E+08	.14320E+08	.00000	.33094E+07	.00000	.00000
447	-.21050E+08	.21816E+08	.00000	-.51805E+07	.00000	.00000
448	-.17557E+08	.17759E+08	.00000	-.18412E+07	.00000	.00000
449	-.12405E+08	.16328E+08	.00000	-.39041E+07	.00000	.00000
450	.14343E+08	.17096E+08	.00000	-.19240E+08	.00000	.00000
451	.15187E+08	.28348E+08	.00000	-.25545E+08	.00000	.00000
452	.26420E+06	-.35469E+08	.00000	.47301E+07	.00000	.00000
453	-.27329E+07	-.71756E+08	.00000	.18039E+08	.00000	.00000
454	.11172E+07	-.57450E+08	.00000	.16123E+08	.00000	.00000
455	-.23150E+08	.17756E+08	.00000	.48086E+06	.00000	.00000
456	-.15128E+08	.22184E+08	.00000	-.74398E+07	.00000	.00000
457	-.14916E+08	.26137E+08	.00000	-.10505E+08	.00000	.00000
458	-.40232E+07	.13441E+08	.00000	-.84786E+07	.00000	.00000
459	-.28104E+07	.11404E+08	.00000	-.41304E+07	.00000	.00000
460	-.67840E+07	.16548E+08	.00000	-.91487E+07	.00000	.00000
461	-.10520E+07	.13951E+08	.00000	-.11324E+08	.00000	.00000
462	-.20985E+07	.10561E+08	.00000	-.66591E+07	.00000	.00000
463	-.65278E+06	.71258E+07	.00000	-.38913E+07	.00000	.00000
464	.16419E+07	.97711E+06	.00000	-.17171E+07	.00000	.00000
465	.41249E+07	.39879E+07	.00000	-.61741E+07	.00000	.00000
466	.78651E+07	.98916E+07	.00000	-.12525E+08	.00000	.00000
467	-.75094E+06	.17802E+08	.00000	-.13934E+08	.00000	.00000
468	-.37560E+07	.23549E+08	.00000	-.15301E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
469	.28724E+08	.38513E+08	.00000	-.34639E+08	.00000	.00000
470	-.42356E+07	.33841E+08	.00000	-.16301E+08	.00000	.00000
471	-.11797E+08	.30556E+08	.00000	-.82128E+07	.00000	.00000
472	-.34024E+08	.10679E+08	.00000	.42950E+07	.00000	.00000
473	.38970E+08	.34020E+08	.00000	-.28103E+08	.00000	.00000
474	.37528E+08	.37643E+08	.00000	-.27566E+08	.00000	.00000
475	.24855E+08	.39538E+08	.00000	-.22038E+08	.00000	.00000
476	.20711E+08	.42713E+08	.00000	-.20778E+08	.00000	.00000
477	.15595E+08	.38709E+08	.00000	-.17786E+08	.00000	.00000
478	.83285E+07	.23859E+08	.00000	-.13136E+08	.00000	.00000
479	.68696E+07	.42228E+08	.00000	-.17730E+08	.00000	.00000
480	.24580E+08	-.27553E+08	.00000	.77577E+07	.00000	.00000
481	-.77579E+07	.48201E+06	.00000	-.27733E+07	.00000	.00000

482	-.92524E+06	-.51105E+08	.00000	.96793E+07	.00000	.00000
483	.23975E+07	-.52301E+08	.00000	.18323E+08	.00000	.00000
484	13719.	-.50674E+08	.00000	.23103E+08	.00000	.00000
485	.78719E+06	-.30843E+08	.00000	.29327E+07	.00000	.00000
486	-.64426E+07	-.53596E+08	.00000	.31055E+08	.00000	.00000
487	-.18977E+08	-.65242E+08	.00000	.44232E+08	.00000	.00000
488	-.14446E+08	-.46108E+08	.00000	.36944E+08	.00000	.00000
489	-.89405E+07	-.28313E+08	.00000	.27568E+08	.00000	.00000
490	.24984E+08	.23538E+08	.00000	-.14658E+08	.00000	.00000
491	-.28200E+08	-.48788E+07	.00000	.21892E+08	.00000	.00000
492	-.22808E+08	.95380E+07	.00000	.45201E+07	.00000	.00000
493	.72774E+07	.55393E+08	.00000	-.20616E+08	.00000	.00000
494	-.20767E+07	.32125E+08	.00000	-.18817E+08	.00000	.00000
495	.82957E+07	-.92802E+07	.00000	-.26055E+07	.00000	.00000
496	-.98195E+06	.83127E+07	.00000	-.21164E+07	.00000	.00000
497	.97092E+06	.34513E+07	.00000	-.31531E+07	.00000	.00000
498	.55264E+06	.70369E+07	.00000	-.61947E+07	.00000	.00000
499	.61451E+06	.99081E+07	.00000	-.91903E+07	.00000	.00000
500	-.10423E+08	.20034E+08	.00000	-.90490E+07	.00000	.00000
501	.43919E+07	.11817E+08	.00000	-.10048E+08	.00000	.00000
861	-.26435E+08	-.51762E+08	.00000	-.28487E+08	.00000	.00000
862	-.26771E+07	.30405E+07	.00000	.47548E+07	.00000	.00000
863	-.27387E+07	.14160E+07	.00000	.41995E+07	.00000	.00000
864	-.32418E+07	.11546E+07	.00000	.43688E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
865	-.32258E+07	.11912E+07	.00000	.53417E+07	.00000	.00000
866	-.17191E+07	.13328E+07	.00000	.67998E+07	.00000	.00000
867	.13524E+07	.15359E+07	.00000	.78575E+07	.00000	.00000
868	.47637E+07	.23030E+07	.00000	.84011E+07	.00000	.00000
869	.81088E+07	.31637E+07	.00000	.90017E+07	.00000	.00000
870	.11477E+08	.33483E+07	.00000	.89172E+07	.00000	.00000
871	.13431E+08	.32858E+07	.00000	.75040E+07	.00000	.00000
872	.12878E+08	.33290E+07	.00000	.54970E+07	.00000	.00000
873	.98217E+07	.37895E+07	.00000	.33779E+07	.00000	.00000
874	.61111E+07	.51403E+07	.00000	.15915E+07	.00000	.00000
875	.36185E+07	.75273E+07	.00000	.79501E+06	.00000	.00000
876	.35363E+07	.10523E+08	.00000	-.19315E+07	.00000	.00000
877	.37476E+07	.13885E+08	.00000	-.51774E+07	.00000	.00000
878	-.36004E+07	.74272E+07	.00000	.39883E+07	.00000	.00000
879	-.41632E+07	.14697E+08	.00000	.11321E+07	.00000	.00000
880	-.43919E+07	.11135E+08	.00000	.30470E+07	.00000	.00000
881	.19392E+07	-.12682E+07	.00000	-.12541E+08	.00000	.00000
882	-.20974E+07	-.25360E+07	.00000	-.11375E+08	.00000	.00000
883	.67980E+07	.55200E+06	.00000	-.12482E+08	.00000	.00000
884	.10801E+08	.14165E+07	.00000	-.11272E+08	.00000	.00000
885	.83816E+07	-.76573E+06	.00000	-.12012E+08	.00000	.00000
886	.49460E+07	-.52904E+06	.00000	-.13135E+08	.00000	.00000
887	.62220E+07	-.10100E+07	.00000	-.12152E+08	.00000	.00000
888	.38736E+07	-.37886E+06	.00000	-.12649E+08	.00000	.00000
889	.13954E+07	-.15567E+06	.00000	-.12696E+08	.00000	.00000
890	-.34115E+07	-.42426E+07	.00000	-.10165E+08	.00000	.00000
891	-.70981E+06	-.32441E+07	.00000	-.92064E+07	.00000	.00000
892	.23146E+07	.50805E+06	.00000	-.93884E+07	.00000	.00000
893	.51339E+07	.56033E+07	.00000	-.96063E+07	.00000	.00000
894	.58078E+07	.11379E+08	.00000	-.81622E+07	.00000	.00000
895	.61510E+07	.13634E+08	.00000	-.55880E+07	.00000	.00000
896	.21380E+07	.92193E+07	.00000	-.34344E+07	.00000	.00000
897	.59477E+07	.13291E+08	.00000	-.40919E+07	.00000	.00000
898	.39023E+07	.87721E+07	.00000	-.18288E+07	.00000	.00000
899	.43406E+07	.11563E+08	.00000	-.34122E+07	.00000	.00000
900	.21500E+07	.38566E+07	.00000	-.38518E+07	.00000	.00000
901	-.18442E+07	.11712E+08	.00000	.14406E+06	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
902	-.15876E+07	.10515E+08	.00000	.10210E+06	.00000	.00000
903	-.22253E+07	.90985E+07	.00000	.15114E+07	.00000	.00000
904	.68849E+06	.11918E+08	.00000	-.12687E+07	.00000	.00000
905	-.28348E+08	-.13489E+07	.00000	-.77905E+07	.00000	.00000
906	-.45161E+06	.24608E+07	.00000	-.45230E+07	.00000	.00000
907	-.69845E+06	.98859E+07	.00000	.16355E+07	.00000	.00000
908	-.44274E+06	.11764E+08	.00000	.11045E+06	.00000	.00000
909	.19179E+07	.96750E+07	.00000	.89982E+06	.00000	.00000
910	-.25700E+06	.11066E+08	.00000	.12072E+07	.00000	.00000

911	-.48889E+07	.12635E+08	.00000	.35916E+07	.00000	.00000
912	-.63247E+07	.11838E+08	.00000	.59593E+07	.00000	.00000
913	-.26861E+07	.12078E+08	.00000	.22219E+07	.00000	.00000
914	-.58215E+06	.98393E+07	.00000	.38150E+07	.00000	.00000
915	-.28830E+07	.10280E+08	.00000	.53486E+07	.00000	.00000
916	-.41019E+07	.91241E+07	.00000	.77948E+07	.00000	.00000
917	-.71499E+07	.10239E+08	.00000	.83158E+07	.00000	.00000
918	-.92195E+07	.89356E+07	.00000	.10546E+08	.00000	.00000
919	-.12612E+08	-.24408E+08	.00000	.19265E+08	.00000	.00000
920	-.44683E+07	.53376E+06	.00000	-.26894E+07	.00000	.00000
921	-.73053E+07	-.46334E+07	.00000	.76283E+06	.00000	.00000
922	-.30370E+07	.28126E+07	.00000	-.12614E+07	.00000	.00000
923	-.68258E+07	-.10478E+08	.00000	.13239E+07	.00000	.00000
924	-.40775E+07	-.37782E+07	.00000	.26699E+07	.00000	.00000
925	-.38948E+07	-.10860E+08	.00000	.19233E+07	.00000	.00000
926	.22889E+06	-.10984E+08	.00000	-.15569E+06	.00000	.00000
927	.22565E+07	-.85322E+07	.00000	-.35386E+07	.00000	.00000
928	.25020E+07	-.59969E+07	.00000	-.10901E+07	.00000	.00000
929	.40989E+07	-.39436E+07	.00000	-.51084E+07	.00000	.00000
930	.22611E+07	-.42084E+07	.00000	-.49164E+07	.00000	.00000
931	.76201E+07	-37438.	.00000	-.54816E+07	.00000	.00000
932	.24060E+07	-.32422E+06	.00000	-.57839E+07	.00000	.00000
933	.11418E+08	.19319E+07	.00000	-.63830E+07	.00000	.00000
934	.13023E+08	.21955E+07	.00000	-.79087E+07	.00000	.00000
935	-.26684E+07	.46295E+07	.00000	.40225E+07	.00000	.00000
936	-.22911E+07	.39851E+07	.00000	.46182E+07	.00000	.00000
937	-.27319E+07	.68164E+07	.00000	.31461E+07	.00000	.00000
938	-.20159E+07	.68944E+07	.00000	.33111E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
939	-.16526E+07	.92775E+07	.00000	.14797E+07	.00000	.00000
940	-.14296E+07	.23671E+07	.00000	.55984E+07	.00000	.00000
941	.22058E+07	.48694E+06	.00000	.61268E+07	.00000	.00000
942	10730.	.92167E+06	.00000	.61267E+07	.00000	.00000
943	.22909E+07	.57598E+06	.00000	.54342E+07	.00000	.00000
944	.43110E+07	.13197E+07	.00000	.59336E+07	.00000	.00000
945	.59289E+07	.28047E+07	.00000	.67878E+07	.00000	.00000
946	.10235E+08	.33725E+07	.00000	.87335E+07	.00000	.00000
947	.79776E+07	.35792E+07	.00000	.82951E+07	.00000	.00000
948	.11442E+08	.29693E+07	.00000	.78097E+07	.00000	.00000
949	.10766E+08	.30069E+07	.00000	.62670E+07	.00000	.00000
950	.85390E+07	.38591E+07	.00000	.50650E+07	.00000	.00000
951	.69344E+07	.49277E+07	.00000	.33350E+07	.00000	.00000
952	.43766E+07	.66123E+07	.00000	.29164E+07	.00000	.00000
953	.27319E+07	.81742E+07	.00000	.23469E+07	.00000	.00000
954	-.14245E+07	-.14899E+07	.00000	-.96878E+07	.00000	.00000
955	.10610E+06	-.22501E+07	.00000	-.83889E+07	.00000	.00000
956	.26907E+07	-.25050E+07	.00000	-.83073E+07	.00000	.00000
957	.35234E+07	-.16782E+07	.00000	-.91347E+07	.00000	.00000
958	.48984E+07	.10615E+07	.00000	-.10139E+08	.00000	.00000
959	.51147E+07	-.16171E+07	.00000	-.87075E+07	.00000	.00000
960	-82634.	125.18	.00000	-.11013E+08	.00000	.00000
961	.64391E+06	-.40658E+06	.00000	-.91233E+07	.00000	.00000
962	.10063E+08	-.69389E+06	.00000	-.98496E+07	.00000	.00000
963	.78145E+07	-.13298E+07	.00000	-.10651E+08	.00000	.00000
964	.62361E+07	-.12744E+07	.00000	-.11035E+08	.00000	.00000
965	.50055E+07	-.87693E+06	.00000	-.11777E+08	.00000	.00000
966	.35919E+07	-.24830E+06	.00000	-.11960E+08	.00000	.00000
967	.20368E+07	.23685E+06	.00000	-.11988E+08	.00000	.00000
968	.12294E+08	.14818E+07	.00000	-.94017E+07	.00000	.00000
969	.94489E+07	3798.6	.00000	-.71879E+07	.00000	.00000
970	.79380E+07	-.11588E+07	.00000	-.85645E+07	.00000	.00000
971	.64470E+07	-.14135E+07	.00000	-.96127E+07	.00000	.00000
972	.51230E+07	-.12209E+07	.00000	-.10465E+08	.00000	.00000
973	.42388E+07	-.69873E+06	.00000	-.11319E+08	.00000	.00000
974	.35763E+07	-.22766E+06	.00000	-.11440E+08	.00000	.00000
975	.28576E+07	.22475E+06	.00000	-.11389E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
976	.16656E+07	.45431E+06	.00000	-.10588E+08	.00000	.00000
977	.35601E+07	.65328E+07	.00000	-.91580E+07	.00000	.00000
978	.44288E+07	.53171E+07	.00000	-.22214E+07	.00000	.00000
979	.16888E+07	.19507E+07	.00000	-.40819E+06	.00000	.00000
980	-.94698E+06	.10816E+08	.00000	-56491.	.00000	.00000

981	.12572E+07	.91258E+07	.00000	.28839E+07	.00000	.00000
982	.25285E+06	-.55619E+07	.00000	.25620E+07	.00000	.00000
983	-3026.0	.82821E+07	.00000	.58816E+07	.00000	.00000
984	-.11508E+07	.78710E+07	.00000	.74282E+07	.00000	.00000
985	.14149E+07	.81165E+07	.00000	.46615E+07	.00000	.00000
986	.22900E+07	.67967E+07	.00000	.61677E+07	.00000	.00000
987	.11386E+07	.67904E+07	.00000	.72464E+07	.00000	.00000
988	.88646E+06	.59618E+07	.00000	.85979E+07	.00000	.00000
989	-.18270E+07	.68323E+07	.00000	.90985E+07	.00000	.00000
990	.48678E+07	.16232E+07	.00000	-.52246E+07	.00000	.00000
991	.81459E+07	.13639E+07	.00000	-.56263E+07	.00000	.00000
992	-.48661E+07	.73435E+07	.00000	.10041E+08	.00000	.00000
993	-.16604E+06	.12363E+08	.00000	-.54587E+06	.00000	.00000
994	.81942E+06	.11285E+07	.00000	-.49196E+07	.00000	.00000
995	-.52051E+06	.56906E+07	.00000	.41967E+07	.00000	.00000
996	.86684E+07	.30627E+07	.00000	.84822E+07	.00000	.00000
997	.98921E+07	.30003E+07	.00000	.85802E+07	.00000	.00000
998	.10041E+08	.28223E+07	.00000	.80397E+07	.00000	.00000
999	.91425E+07	.31226E+07	.00000	.71005E+07	.00000	.00000
1000	.72062E+07	.40613E+07	.00000	.63590E+07	.00000	.00000
1001	.60151E+07	.52117E+07	.00000	.45950E+07	.00000	.00000
1002	.41721E+07	.63944E+07	.00000	.44597E+07	.00000	.00000
1003	.27614E+07	.76154E+07	.00000	.37625E+07	.00000	.00000
1004	.40751E+07	.45781E+06	.00000	.48227E+07	.00000	.00000
1005	.33636E+07	-.14537E+07	.00000	-.79089E+07	.00000	.00000
1006	.57735E+07	.14674E+07	.00000	.48421E+07	.00000	.00000
1007	.73494E+07	.26674E+07	.00000	.70150E+07	.00000	.00000
1008	.53910E+07	.10412E+07	.00000	-.88264E+07	.00000	.00000
1009	.35155E+06	.20652E+07	.00000	.55689E+07	.00000	.00000
1010	.14502E+07	.18777E+07	.00000	.45479E+07	.00000	.00000
1011	.33853E+07	.35459E+06	.00000	.39811E+07	.00000	.00000
1012	.63087E+07	-.47112E+06	.00000	-.65954E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1013	.57027E+07	-.11246E+07	.00000	-.78321E+07	.00000	.00000
1014	.47668E+07	-.12667E+07	.00000	-.87534E+07	.00000	.00000
1015	.63375E+07	.46537E+06	.00000	-.56664E+07	.00000	.00000
1016	.31925E+07	.46704E+06	.00000	-.51504E+07	.00000	.00000
1017	.42009E+07	-.53186E+06	.00000	-.63813E+07	.00000	.00000
1018	.38296E+07	-.11339E+07	.00000	-.93511E+07	.00000	.00000
1019	.39873E+07	-.90929E+06	.00000	-.10448E+08	.00000	.00000
1020	.31024E+07	-.91973E+06	.00000	-.96442E+07	.00000	.00000
1021	.33878E+07	-.68085E+06	.00000	-.10363E+08	.00000	.00000
1022	.37225E+07	-.48497E+06	.00000	-.10993E+08	.00000	.00000
1023	.34587E+07	-11432.	.00000	-.11067E+08	.00000	.00000
1024	.33135E+07	.42683E+06	.00000	-.10355E+08	.00000	.00000
1025	.28755E+07	60635.	.00000	-.89858E+07	.00000	.00000
1026	.30364E+07	.68937E+07	.00000	.50300E+07	.00000	.00000
1027	.46380E+07	.55311E+07	.00000	.59931E+07	.00000	.00000
1028	.60829E+07	.41425E+07	.00000	.74859E+07	.00000	.00000
1029	.35764E+07	.51976E+07	.00000	.78072E+07	.00000	.00000
1030	.35559E+06	.49213E+07	.00000	.10044E+08	.00000	.00000
1031	-.20069E+07	.55463E+07	.00000	.10430E+08	.00000	.00000
1032	.44782E+07	.12067E+07	.00000	-.49906E+07	.00000	.00000
1033	-.18154E+08	-59767.	.00000	-.29410E+07	.00000	.00000
1034	-.13991E+08	42148.	.00000	-.25588E+07	.00000	.00000
1035	-.12202E+08	-.10652E+07	.00000	-.66156E+07	.00000	.00000
1036	-.93819E+07	-.24468E+06	.00000	-.52843E+07	.00000	.00000
1037	-.10487E+08	8326.8	.00000	-.25859E+07	.00000	.00000
1038	-.66639E+07	2510.4	.00000	-.30667E+07	.00000	.00000
1039	-.23305E+07	.36319E+06	.00000	-.35007E+07	.00000	.00000
1040	-.27263E+06	-.71216E+06	.00000	-.25628E+07	.00000	.00000
1041	.10790E+07	-.14626E+07	.00000	-.56982E+06	.00000	.00000
1042	.10253E+07	-.80794E+06	.00000	.19834E+07	.00000	.00000
1043	-.43824E+06	.20751E+07	.00000	.23967E+07	.00000	.00000
1044	.17355E+07	.12088E+07	.00000	-.33732E+07	.00000	.00000
1045	-280.17	.76048E+06	.00000	.61935E+06	.00000	.00000
1046	-.46859E+07	.23975E+06	.00000	-.27766E+07	.00000	.00000
1047	-.19667E+07	-10143.	.00000	-.47153E+07	.00000	.00000
1048	-.90603E+06	.62206E+06	.00000	-.43441E+07	.00000	.00000
1049	.38234E+07	95236.	.00000	.21697E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1050	.73156E+06	.65480E+06	.00000	.10676E+07	.00000	.00000

1051	.60519E+06	.22893E+07	.00000	.23748E+07	.00000	.00000
1052	.20778E+06	.45624E+07	.00000	.29003E+07	.00000	.00000
1053	-.13202E+08	.14054E+07	.00000	.15987E+08	.00000	.00000
1054	-.15091E+08	-.71989E+07	.00000	.18893E+08	.00000	.00000
1055	-.45642E+07	-.17956E+08	.00000	.15101E+08	.00000	.00000
1056	-.36571E+07	-.26978E+08	.00000	.11547E+08	.00000	.00000
1057	-.52019E+07	-.41744E+08	.00000	.58959E+07	.00000	.00000
1058	-.17007E+08	-.50882E+08	.00000	.18530E+08	.00000	.00000
1059	-.15958E+08	-.18619E+08	.00000	-.14061E+08	.00000	.00000
1060	-.14997E+08	-.95073E+07	.00000	-.11633E+08	.00000	.00000
1061	-.16768E+08	-.29896E+07	.00000	-.82674E+07	.00000	.00000
1062	.21988E+07	.48628E+07	.00000	-.58155E+07	.00000	.00000
1063	-.97121E+07	.48613E+07	.00000	.13399E+08	.00000	.00000
1064	-.78986E+07	-.54827E+06	.00000	.15302E+08	.00000	.00000
1065	-.97865E+07	-.43979E+07	.00000	.16773E+08	.00000	.00000
1066	.61867E+06	.36004E+07	.00000	-.52378E+06	.00000	.00000
1067	.14473E+07	.16004E+07	.00000	-.26221E+07	.00000	.00000
1068	.31088E+06	-.88588E+06	.00000	-.47921E+07	.00000	.00000
1069	-.61480E+07	.52765E+07	.00000	.12093E+08	.00000	.00000
1070	-.57505E+07	.19680E+07	.00000	.13771E+08	.00000	.00000
1071	-.31506E+07	.55456E+06	.00000	.13680E+08	.00000	.00000
1072	-.36739E+07	-.19958E+07	.00000	.14620E+08	.00000	.00000
1073	-.56569E+07	-.56799E+07	.00000	.15831E+08	.00000	.00000
1074	-.82160E+07	-.11241E+08	.00000	.17126E+08	.00000	.00000
1075	-.33024E+07	-.10977E+08	.00000	.15240E+08	.00000	.00000
1076	.13808E+07	-.29334E+07	.00000	-.31846E+07	.00000	.00000
1077	.63153E+07	-.11948E+07	.00000	-.79203E+07	.00000	.00000
1078	.51831E+07	-.66751E+06	.00000	-.79850E+07	.00000	.00000
1079	.79704E+07	-.56483E+06	.00000	-.73005E+07	.00000	.00000
1080	.59740E+07	.32808E+06	.00000	.26563E+07	.00000	.00000
1081	-.87154E+07	-.33169E+08	.00000	-.94264E+07	.00000	.00000
1082	-.16086E+07	-.29051E+08	.00000	-.16016E+07	.00000	.00000
1083	-.48952E+07	-.22243E+08	.00000	-.87484E+07	.00000	.00000
1084	-.85521E+07	-.14574E+08	.00000	-.11002E+08	.00000	.00000
1085	-.11288E+08	-.60499E+07	.00000	-.10057E+08	.00000	.00000
1086	-.11859E+08	-.34321E+07	.00000	-.88420E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1087	-.88446E+07	-.29111E+07	.00000	-.88472E+07	.00000	.00000
1088	-.74154E+07	-.18603E+07	.00000	-.83582E+07	.00000	.00000
1089	.32484E+07	.41090E+07	.00000	.95966E+07	.00000	.00000
1090	-.31137E+07	.46313E+07	.00000	.11555E+08	.00000	.00000
1091	.92693E+07	.26724E+07	.00000	.87480E+07	.00000	.00000
1092	.91226E+07	.27449E+07	.00000	.83226E+07	.00000	.00000
1093	.79710E+07	.31626E+07	.00000	.80485E+07	.00000	.00000
1094	.64336E+07	.31625E+07	.00000	.91338E+07	.00000	.00000
1095	.93303E+07	.20004E+07	.00000	.82866E+07	.00000	.00000
1096	.90469E+07	.90503E+06	.00000	.49173E+07	.00000	.00000
1097	.47131E+07	.43455E+06	.00000	.36125E+07	.00000	.00000
1098	.51228E+07	85523.	.00000	-.87513E+07	.00000	.00000
1099	.21921E+07	.56707E+06	.00000	.25818E+07	.00000	.00000
1100	.34886E+07	-.88428E+06	.00000	-.71322E+07	.00000	.00000
1101	.28641E+07	-.10157E+07	.00000	-.79716E+07	.00000	.00000
1102	.15656E+07	-.17970E+06	.00000	-.55754E+07	.00000	.00000
1103	.43222E+07	.12660E+07	.00000	-.57080E+07	.00000	.00000
1104	.72133E+07	-.22884E+06	.00000	-.65472E+07	.00000	.00000
1105	.22852E+07	-.95330E+06	.00000	-.85730E+07	.00000	.00000
1106	.91984E+06	-.59949E+06	.00000	-.64740E+07	.00000	.00000
1107	.97769E+06	-.78372E+06	.00000	-.74155E+07	.00000	.00000
1108	.47387E+06	-.75465E+06	.00000	-.78865E+07	.00000	.00000
1109	.18317E+07	-.81055E+06	.00000	-.90434E+07	.00000	.00000
1110	.27517E+07	-.74701E+06	.00000	-.98105E+07	.00000	.00000
1111	.30019E+07	-.55114E+06	.00000	-.10200E+08	.00000	.00000
1112	.34920E+07	-.32990E+06	.00000	-.10695E+08	.00000	.00000
1113	.38146E+07	62575.	.00000	-.10602E+08	.00000	.00000
1114	.48867E+07	.28049E+06	.00000	-.98427E+07	.00000	.00000
1115	.74627E+07	85125.	.00000	-.84502E+07	.00000	.00000
1116	.11692E+08	-84014.	.00000	-.62220E+07	.00000	.00000
1117	.10645E+08	-.22186E+06	.00000	-.41961E+07	.00000	.00000
1118	.20365E+08	-.10516E+06	.00000	-.50390E+07	.00000	.00000
1119	.23759E+08	-.42470E+06	.00000	-.44292E+07	.00000	.00000
1120	.26025E+08	-.97720E+06	.00000	-.29916E+07	.00000	.00000
1121	.27397E+08	-.14144E+07	.00000	-.33809E+06	.00000	.00000
1122	.26942E+08	-.13782E+07	.00000	.25864E+07	.00000	.00000
1123	.23936E+08	-.10020E+07	.00000	.51772E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1124	.15416E+08	18102.	.00000	-.59405E+07	.00000	.00000
1125	.10365E+08	-.11388E+06	.00000	-.84421E+07	.00000	.00000
1126	.14614E+08	-.10197E+07	.00000	-.74064E+07	.00000	.00000
1127	.19473E+08	-.30876E+06	.00000	.65565E+07	.00000	.00000
1128	.13826E+08	.40557E+06	.00000	.67917E+07	.00000	.00000
1129	.54709E+07	.21844E+07	.00000	.10722E+08	.00000	.00000
1130	-.38841E+06	.37834E+07	.00000	.11282E+08	.00000	.00000
1131	.23558E+07	.30498E+07	.00000	.10973E+08	.00000	.00000
1132	.14042E+07	.17185E+07	.00000	.12094E+08	.00000	.00000
1133	-.11404E+07	.24579E+07	.00000	.12334E+08	.00000	.00000
1134	-.61632E+07	-.21823E+06	.00000	-.52724E+07	.00000	.00000
1135	-.20025E+07	-.44564E+06	.00000	-.62030E+07	.00000	.00000
1136	-.50640E+07	-.54159E+06	.00000	-.72507E+07	.00000	.00000
1137	-.29547E+07	-.49472E+06	.00000	-.71483E+07	.00000	.00000
1138	-.73831E+07	-.89957E+06	.00000	-.74287E+07	.00000	.00000
1139	-.42880E+07	-.10434E+07	.00000	-.83720E+07	.00000	.00000
1140	-.26367E+07	-.81855E+06	.00000	-.85275E+07	.00000	.00000
1141	-.22245E+07	-.62016E+06	.00000	-.81840E+07	.00000	.00000
1142	-.10046E+07	-.61934E+06	.00000	-.82034E+07	.00000	.00000
1143	-.10502E+07	-.61712E+06	.00000	-.75768E+07	.00000	.00000
1144	.32703E+06	-.70101E+06	.00000	-.84568E+07	.00000	.00000
1145	.12975E+07	-.69571E+06	.00000	-.91319E+07	.00000	.00000
1146	.22165E+07	-.66924E+06	.00000	-.96538E+07	.00000	.00000
1147	.26426E+07	-.50284E+06	.00000	-.10008E+08	.00000	.00000
1148	.34050E+07	-.29354E+06	.00000	-.10383E+08	.00000	.00000
1149	.43040E+07	-19840.	.00000	-.10276E+08	.00000	.00000
1150	.61182E+07	.11404E+06	.00000	-.96323E+07	.00000	.00000
1151	.42280E+07	-.22780E+06	.00000	-.10105E+08	.00000	.00000
1152	.66893E+07	-.15792E+06	.00000	-.95919E+07	.00000	.00000
1153	.54169E+07	-.53638E+06	.00000	-.97384E+07	.00000	.00000
1154	.79398E+07	-.48807E+06	.00000	-.92897E+07	.00000	.00000
1155	-.68084E+06	-.20717E+08	.00000	.11201E+08	.00000	.00000
1156	-.44843E+06	-.24864E+08	.00000	.80658E+07	.00000	.00000
1157	-.16386E+07	-.29178E+08	.00000	.55736E+07	.00000	.00000
1158	.77298E+06	-.25030E+08	.00000	.40334E+07	.00000	.00000
1159	.15600E+07	-.23280E+08	.00000	.32075E+06	.00000	.00000
1160	.56538E+06	-.21657E+08	.00000	-.36706E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1161	-.13205E+06	-.17562E+08	.00000	-.65385E+07	.00000	.00000
1162	-.34117E+07	-.15958E+08	.00000	-.89276E+07	.00000	.00000
1163	-.33023E+07	-.11930E+08	.00000	-.94967E+07	.00000	.00000
1164	-.80587E+07	-.95564E+07	.00000	-.10609E+08	.00000	.00000
1165	-.62435E+07	-.65042E+07	.00000	-.10022E+08	.00000	.00000
1166	-.88797E+07	-.46457E+07	.00000	-.95701E+07	.00000	.00000
1167	-.60000E+07	-.42804E+07	.00000	-.95976E+07	.00000	.00000
1168	-.55310E+07	-.28538E+07	.00000	-.91937E+07	.00000	.00000
1169	-.48666E+07	-.20509E+07	.00000	-.89337E+07	.00000	.00000
1170	-.53762E+07	-.14685E+07	.00000	-.84770E+07	.00000	.00000
1171	-.29524E+07	-.16797E+07	.00000	-.91053E+07	.00000	.00000
1172	-.19477E+07	-.11692E+07	.00000	-.90437E+07	.00000	.00000
1173	-.10614E+07	-.93648E+06	.00000	-.90974E+07	.00000	.00000
1174	-.92711E+06	-.74667E+06	.00000	-.89416E+07	.00000	.00000
1175	-.38107E+06	-.64726E+06	.00000	-.88608E+07	.00000	.00000
1176	.47034E+06	-.65132E+06	.00000	-.89424E+07	.00000	.00000
1177	.17024E+07	-.61018E+06	.00000	-.95449E+07	.00000	.00000
1178	.25811E+07	-.46829E+06	.00000	-.99504E+07	.00000	.00000
1179	.30402E+07	-.39610E+06	.00000	-.10137E+08	.00000	.00000
1180	.34854E+07	-.28040E+06	.00000	-.10203E+08	.00000	.00000
1181	.29045E+07	-.48069E+06	.00000	-.99172E+07	.00000	.00000
1182	.40782E+07	-.46962E+06	.00000	-.99334E+07	.00000	.00000
1183	.20853E+07	-.67570E+06	.00000	-.97424E+07	.00000	.00000
1184	.35853E+07	-.75633E+06	.00000	-.98083E+07	.00000	.00000
1185	.53666E+07	-.86369E+06	.00000	-.96562E+07	.00000	.00000
1186	.82318E+07	-.11338E+07	.00000	-.91337E+07	.00000	.00000
1187	.12669E+08	-.35232E+06	.00000	-.79285E+07	.00000	.00000
1188	.86677E+07	-.23895E+07	.00000	-.86639E+07	.00000	.00000
1189	.15298E+08	-.26210E+07	.00000	-.63882E+07	.00000	.00000
1190	.15798E+08	-.55480E+07	.00000	-.28349E+07	.00000	.00000
1191	.18700E+08	-.51082E+07	.00000	.19812E+07	.00000	.00000
1192	.17502E+08	-.44319E+07	.00000	.61309E+07	.00000	.00000
1193	.14046E+08	-.23838E+07	.00000	.96859E+07	.00000	.00000
1194	.12573E+08	91089.	.00000	.97115E+07	.00000	.00000
1195	.10666E+08	.12350E+07	.00000	.92574E+07	.00000	.00000
1196	-.35268E+07	.27389E+07	.00000	.12811E+08	.00000	.00000
1197	-.11990E+07	-.11131E+07	.00000	.13744E+08	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1198	-.31809E+06	-.37680E+07	.00000	.14033E+08	.00000	.00000
1199	-.18127E+07	-.65894E+07	.00000	.14716E+08	.00000	.00000
1200	-.57705E+06	-.15166E+08	.00000	.13183E+08	.00000	.00000
1201	.24216E+07	-.13378E+08	.00000	.11744E+08	.00000	.00000
1202	.20031E+07	-.17426E+08	.00000	.10211E+08	.00000	.00000
1203	.17791E+07	-.21329E+08	.00000	.74953E+07	.00000	.00000
1204	.34692E+07	-.20538E+08	.00000	.36067E+07	.00000	.00000
1205	.36778E+07	-.19464E+08	.00000	-.27476E+06	.00000	.00000
1206	.37488E+07	-.16687E+08	.00000	-.34400E+07	.00000	.00000
1207	-.14066E+07	.85161E+06	.00000	.13143E+08	.00000	.00000
1208	.44914E+06	-.59944E+06	.00000	.13206E+08	.00000	.00000
1209	.89004E+06	-.20404E+07	.00000	.13442E+08	.00000	.00000
1210	.22121E+07	-.39788E+07	.00000	.13356E+08	.00000	.00000
1211	.15053E+07	-.69145E+07	.00000	.13556E+08	.00000	.00000
1212	.20926E+06	-.10502E+08	.00000	.13716E+08	.00000	.00000
1213	.89449E+07	.22768E+07	.00000	.91616E+07	.00000	.00000
1214	.87247E+07	.14820E+07	.00000	.10234E+08	.00000	.00000
1215	.79445E+07	-.24072E+06	.00000	.11473E+08	.00000	.00000
1216	.41314E+07	.11519E+07	.00000	.11707E+08	.00000	.00000
1217	.50797E+06	.63819E+06	.00000	.12764E+08	.00000	.00000
1218	.32582E+07	-.11797E+07	.00000	.12749E+08	.00000	.00000
1219	30845.	-.13949E+08	.00000	-.77185E+07	.00000	.00000
1220	-.36612E+07	-.87426E+07	.00000	-.98245E+07	.00000	.00000
1221	-.27363E+07	-.69650E+07	.00000	-.97101E+07	.00000	.00000
1222	-.30585E+07	-.37412E+07	.00000	-.95890E+07	.00000	.00000
1223	-.29416E+07	-.25709E+07	.00000	-.93860E+07	.00000	.00000
1224	-.67702E+06	-.95698E+07	.00000	-.90244E+07	.00000	.00000
1225	-.30652E+07	-.53399E+07	.00000	-.97262E+07	.00000	.00000
1226	-.33277E+06	-.45021E+07	.00000	-.95608E+07	.00000	.00000
1227	-.56010E+06	-.32058E+07	.00000	-.95871E+07	.00000	.00000
1228	-.38230E+06	-.22265E+07	.00000	-.95462E+07	.00000	.00000
1229	-44010.	-.11363E+07	.00000	-.94193E+07	.00000	.00000
1230	.36837E+06	-.84693E+06	.00000	-.94117E+07	.00000	.00000
1231	-.57038E+06	-.15451E+07	.00000	-.94336E+07	.00000	.00000
1232	.12279E+07	-.13905E+07	.00000	-.96090E+07	.00000	.00000
1233	.18388E+07	-.10024E+07	.00000	-.96743E+07	.00000	.00000
1234	.62137E+06	-.67684E+06	.00000	-.93741E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1235	.11012E+07	-.60950E+06	.00000	-.94164E+07	.00000	.00000
1236	.18081E+07	-.58000E+06	.00000	-.96897E+07	.00000	.00000
1237	.34700E+07	-.10476E+07	.00000	-.97311E+07	.00000	.00000
1238	.44493E+07	-.13144E+07	.00000	-.96358E+07	.00000	.00000
1239	.49446E+07	-.18922E+07	.00000	-.94677E+07	.00000	.00000
1240	.51852E+07	-.11348E+08	.00000	.10632E+08	.00000	.00000
1241	.44360E+07	-.14790E+08	.00000	.93393E+07	.00000	.00000
1242	.40690E+07	-.17896E+08	.00000	.70660E+07	.00000	.00000
1243	.30364E+07	-.99896E+07	.00000	.12430E+08	.00000	.00000
1244	.53955E+07	-.90166E+07	.00000	.11477E+08	.00000	.00000
1245	.93398E+07	-.80022E+07	.00000	.95866E+07	.00000	.00000
1246	.67436E+07	-.12365E+08	.00000	.86813E+07	.00000	.00000
1247	.61543E+07	-.14945E+08	.00000	.69388E+07	.00000	.00000
1248	.56283E+07	-.16979E+08	.00000	.46629E+07	.00000	.00000
1249	.53522E+07	-.17707E+08	.00000	.21545E+07	.00000	.00000
1250	.66881E+07	-.15210E+08	.00000	-.35971E+06	.00000	.00000
1251	.66932E+07	-.13286E+08	.00000	-.30328E+07	.00000	.00000
1252	.50340E+07	-.13324E+08	.00000	-.46522E+07	.00000	.00000
1253	.24541E+07	-.14797E+08	.00000	-.58468E+07	.00000	.00000
1254	.34223E+07	-.11929E+08	.00000	-.66489E+07	.00000	.00000
1255	.59245E+06	-.11078E+08	.00000	-.82526E+07	.00000	.00000
1256	.33062E+07	-.80804E+07	.00000	-.82043E+07	.00000	.00000
1257	-.71893E+06	-.80074E+07	.00000	-.92857E+07	.00000	.00000
1258	-.12823E+06	-.62939E+07	.00000	-.94013E+07	.00000	.00000
1259	.27433E+07	-.51409E+07	.00000	-.90979E+07	.00000	.00000
1260	.20783E+07	-.36487E+07	.00000	-.94415E+07	.00000	.00000
1261	.14205E+07	-.27936E+07	.00000	-.95663E+07	.00000	.00000
1262	.22145E+07	-.21906E+07	.00000	-.95992E+07	.00000	.00000
1263	.10148E+07	-.17914E+07	.00000	-.95928E+07	.00000	.00000
1264	.26989E+07	-.16475E+07	.00000	-.96431E+07	.00000	.00000
1265	.26618E+07	-.12767E+07	.00000	-.96872E+07	.00000	.00000
1266	.40995E+07	-.27824E+07	.00000	-.93791E+07	.00000	.00000
1267	.54363E+07	-.37774E+07	.00000	-.89141E+07	.00000	.00000
1268	.61059E+07	-.52183E+07	.00000	-.82665E+07	.00000	.00000
1269	.90833E+07	-.39248E+07	.00000	-.79616E+07	.00000	.00000

1270	.97241E+07	-.57508E+07	.00000	-.66654E+07	.00000	.00000
1271	.78941E+07	-.99568E+07	.00000	-.49087E+07	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE	SX	SY	SZ	SXY	SYZ	SXZ
1272	.12650E+08	-.94158E+07	.00000	.11526E+07	.00000	.00000
1273	.94801E+07	65327.	.00000	-.83189E+07	.00000	.00000
1274	.12763E+08	-.88484E+07	.00000	.49426E+07	.00000	.00000
1275	.86478E+07	-.12074E+08	.00000	.66589E+07	.00000	.00000
1276	.73995E+07	-.14495E+08	.00000	.50090E+07	.00000	.00000
1277	.72821E+07	-.15157E+08	.00000	.28277E+07	.00000	.00000
1278	.92709E+07	-.12702E+08	.00000	.11919E+07	.00000	.00000
1279	.99341E+07	-.11028E+08	.00000	-.14224E+07	.00000	.00000
1280	.95949E+07	-.12358E+08	.00000	.37139E+07	.00000	.00000
1281	.75090E+07	-.38092E+07	.00000	.11902E+08	.00000	.00000
1282	.43780E+07	-.43181E+07	.00000	.12755E+08	.00000	.00000
1283	.34802E+07	-.59798E+07	.00000	.12896E+08	.00000	.00000
1284	.37723E+07	-.78093E+07	.00000	.12513E+08	.00000	.00000
1285	.56154E+07	-.65784E+07	.00000	.11965E+08	.00000	.00000
1286	-.27509E+07	.35252E+07	.00000	.73071E+06	.00000	.00000

MINIMUM VALUES

NODE	133	245	1	371	1	1
VALUE	-.10728E+09	-.29465E+09	.00000	-.11061E+09	.00000	.00000

MAXIMUM VALUES

NODE	6	14	1	133	1	1
VALUE	.12077E+09	.29654E+09	.00000	.10979E+09	.00000	.00000

***** POST1 NODAL STRESS LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z VALUES ARE IN GLOBAL COORDINATES

NODE SX SY SZ SXY SYZ SXZ

***** ESTIMATED BOUNDS CONSIDERING THE EFFECT OF DISCRETIZATION ERROR *****

MINIMUM VALUES

NODE	8	245	14	14	14	14
VALUE	-.17346E+09	-.40388E+09	.00000	-.16164E+09	.00000	.00000

MAXIMUM VALUES

NODE	6	14	14	245	14	14
VALUE	.12928E+09	.40789E+09	.00000	.16167E+09	.00000	.00000

****

PRINT F REACTION SOLUTIONS PER NODE

***** POST1 TOTAL REACTION SOLUTION LISTING *****

LOAD STEP= 1 SUBSTEP= 1
TIME= 1.0000 LOAD CASE= 0

THE FOLLOWING X,Y,Z SOLUTIONS ARE IN GLOBAL COORDINATES

NODE	FX	FY
15	-368.82	-79.021
16	-527.11	-125.04
17	-52.301	309.89
18	-436.22	1028.0
279	-845.75	-317.04
280	-493.99	-192.36
281	-1075.8	-458.33
282	-590.55	-244.73
283	-1257.7	-501.09
284	-642.78	-252.14
285	-1339.6	-465.72
286	-641.61	-224.81
287	-1316.4	-385.90
288	-596.94	-177.39
289	-1200.7	-293.08
290	-1035.7	-202.44
291	-434.11	-72.452
292	-805.42	-103.62
293	-331.53	-22.729
294	-587.29	.13180
295	-229.92	32.054
296	-383.01	130.27
297	-138.34	104.93
298	-222.86	303.58

```
   299  -76.394       198.54
   300  -141.96       528.64
   301  -167.00       814.09
   302  -80.068       462.01
   303  -278.62       1087.4
   304  -146.83       597.68
   305  -442.49       1385.5
   306  -209.12       735.38
   307  -654.64       1697.5
   308  -315.95       900.51
   309  -796.79       1956.0
   310  -394.44       1007.1
   311  -906.83       2087.7

 ***** POST1 TOTAL REACTION SOLUTION LISTING *****

 LOAD STEP=     1  SUBSTEP=     1
  TIME=    1.0000      LOAD CASE=   0

 THE FOLLOWING X,Y,Z SOLUTIONS ARE IN GLOBAL COORDINATES

   NODE       FX           FY
    312  -886.55       1995.5
    313  -419.99       921.96
    314  -695.17       1663.5
    315  -296.57       734.51
    316  -517.11       1272.9
    317  -254.67       507.97
    318  -403.17       827.60
    319  -237.32       281.90
    320  -448.14       362.15
    321  -268.63       73.671
    322  -602.53      -27.643

TOTAL VALUES
VALUE   -25195.      19863.
```