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Track Standing Wave Analysis

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MPR Associates
1050 Connecticut Avenue, N.W.
Suite 400
By Washington, D.C. 20036

U.S. ARMY TANK-AUTOMOTIVE COMMAND
RESEARCH, DEVELOPMENT & ENGINEERING CENTER
Warren, Michigan 48397-5000

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The purpose of this feasibility study was to determine whether an analytical model capable of calculating the dynamic motion and loads in the tracks and suspension of a tracked vehicle could be developed. Such a model could be used to evaluate causes of track vibration and associated energy dissipation.

An analytical model for the dynamic analysis of tracked vehicles has been developed and a computer program incorporating the model has been written. The vehicle suspension and track geometry are variables specified in the input to this program.

The analytical model provides details of the track motion using a time history solution. Dynamic track tension, which can be correlated with the energy dissipated in the track, is determined as a function of time for each track link.

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19. ABSTRACT (Continued)

Damping in the track/pin rubber bushing interface may be varied in separate analyses to study the effects of damping on dynamic tension and resulting energy dissipation in the track.

The analytical model was configured to represent the M113 Armored Personnel Carrier. Sample analyses of this configuration were completed and tabulated results appear to be reasonable.

PREFACE

The cooperation and assistance provided by Roger Smith, TACOM Technical Representative, and George Poteet, TACOM Liaison Officer at Aberdeen Proving Ground, are appreciated and acknowledged.

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1.0. INTRODUCTION

1.1. Purpose

The purpose of this MPR Associates feasibility study, Contract Number DAAE07-87-C-R061, was to determine whether an analytical model capable of calculating the dynamic motion and loads in the tracks and suspension of a tracked vehicle could be developed. Such a model could be used to evaluate causes of track vibration and the associated energy dissipation. The model could also be used to analyze the effects of design changes made to reduce the energy dissipation associated with vibration of the tracks or to reduce the loads which would occur in the track under normal operation, therefore improving track reliability. With such a model, design changes could be evaluated analytically prior to actual prototype fabrication and field testing, leading to a better understanding of the effects of particular changes to the track on track dynamics.

2.0 OBJECTIVES

This report presents the results of the feasibility study discussed above which was completed under Phase I of the 1987 Small Business Innovation Research Program (SBIR). The initial problem definition for the study is contained in the Department of Defense FY 1987 SBIR Program Solicitation and is as follows:

> *A87-167. TITLE:* Track Standing Wave Analysis
>
> DESCRIPTION: At higher speeds, the momentum of the track on tracked vehicles forms standing waves. These standing waves absorb power and reduce drivetrain efficiency. The hysteresis of rubber bushings in single pin tracks or the hysteresis of the rubber surrounding the pins in double pin tracks dampens the standing waves to an acceptable level. However, the rubber material on tracks is a prime cause of failure and represents a large portion of the life cycle costs of the track. It would be possible to use a more rugged and less costly unbushed track if a means could be found to externally dampen the standing wave formation.

In response to the request for proposal contained in the SBIR Program Solicitation, we proposed an analytical approach, which would be programmed for use on a computer, and which would demonstrate the feasibility of solving the track dynamics problem by obtaining a solution for the loads and displacements in the track and the vehicle suspension for a specific configuration. After the feasibility of the model had been demonstrated on this test problem, we proposed that the model should be used in Phase II of the SBIR program to analyze the effect of changes in track/pin interface stiffness and damping and to investigate alternate track designs which might reduce or eliminate standing waves.

3.0. CONCLUSIONS

The objective of our study was to determine whether an analytical method could be devised which would evaluate the effects of changes in track design on the formation of standing waves which occur in the track of a tracked vehicle. We began our feasibility study by completing several literature searches, including a review of documentation provided by the U.S. Army Tank Automative Command (TACOM) from the TACOM technical library at Warren, Michigan. Based on our understanding of the problem from these literature searches and our experience, we concluded that use of a commercially available finite element program, such as ANSYS, is not feasible because such a program cannot model track motion explicitly. The literature searches also showed that recent research had been completed to address track pin fatigue failure and to develop a low-weight aluminum track. How these research efforts are interrelated with the present study is discussed below in our recommendations.

Our initial analytical approach attempted to solve the equations of motion of a track assuming the existence of steady state standing waves caused by the dynamics of the track shoes as they travel around the tracks. Results obtained from this initial investigation indicated that the existence of standing waves could not be explained without the excitation from a force spectrum resulting from the dynamic interaction of the track and the drive sprocket, idler wheel and road wheels. A trip to Aberdeen Proving Grounds in Maryland on October 19, 1987, during which we observed actual track motion on several vehicles, reinforced our initial conclusion regarding the transient nature of the waves in the track system. For these reasons, we concluded that proper analytical modeling of the track system requires an explicit model of the track and its associated components which is capable of predicting the dynamic, transient response of the entire system.

As a result, a detailed analytical model for the dynamic analysis of a tracked vehicle was developed. This model includes the detailed motion of the track shoes, the drive sprocket, the idler wheel, the road wheels, and the vehicle as a whole. The model allows the specification of a terrain profile over which the vehicle is to proceed. Forces between the vehicle and the drive sprocket; idler wheel and road wheels; between the drive sprocket, idler wheel and road wheels and the track shoes; between individual track shoes; and, between the track shoes and the ground are included in the model and an equation of motion for each component is written in detail. The torsion bar suspension and the shock absorbers are explicitly modeled in these equations. The entire system of equations is then numerically integrated to obtain the transient solution for the motion and forces in the track and suspension. Details on the solution techniques are provided in Section 5.5.

Input data for the M113 Armored Personnel Carrier geometry and suspension configuration were generated for the computer program written to solve the equations discussed above and several test cases were run. In addition, a piece of track was tested to obtain approximate stiffness

constants for the model to represent the rotational stiffness between two shoes. It was found to be necessary to include nonlinear stiffness in the force relationships between the shoes and between the shoes and wheels to obtain realistic results from the model. Results of our initial analyses indicated that a very small time step is required to achieve stable integration (on the order of one-tenth of a millisecond), since there are natural frequencies associated with the track and suspension system which are in the range of several hundred hertz.

The resulting analytical model, developed over a period of 3 months of improvement, trial use and increased detail, is a sophisticated dynamic analysis tool which provides predicted time-dependent reaction forces, track tension, energy dissipation and intercomponent loads for a wide range of geometric parameters. The explicit modeling of the suspension components is a powerful feature of the program in that detailed design features (and changes) can be evaluated. The dynamic loads on suspension and track components are needed to enable designers to evaluate the stresses and fatigue usage in component parts, to understand abnormal failures and to design improvements. Based on our review of the literature, we believe this model provides the first and only such design tool.

The results and conclusions of the Phase I feasibility study can be summarized as follows:

- An analytical model for the dynamic analysis of a tracked vehicle has been developed and a computer program incorporating the model has been written and is operational. The vehicle suspension and track geometry are variables specified in the input to this program.

- The analytical model provides details of the track motion using a time history solution. The dynamic track tension, which can be correlated with the energy dissipated in the track, is determined as a function of time for each track link. Damping in the track/pin rubber bushing interface may be varied in separate analyses to study the effects of damping on dynamic track tension and resulting energy dissipation in the track.

- The analytical model has been configured to represent the M113 Armored Personnel Carrier. Sample analyses of this configuration were completed and tabulated results appear reasonable and realistic. However, actual measured vehicle load data are required to verify that the predicted load magnitudes and frequencies are correct. The model cannot be adequately verified using drawbar pull test curves.

- This modeling technique is capable of defining design loads, load ranges and the number of duty cycles for track components. Preliminary results show oscillating tensile loads in the track and oscillating reaction loads on the drive sprocket, idler wheel and road wheels. Previously, the magnitude and frequency of these loads have not been well understood. This analytical technique provides a

powerful tool for the design and analyses of new track designs or modifications to existing designs.

4.0. RECOMMENDATIONS

4.1. Phase II Research

Based on the results of the feasibility study, we recommend the following courses of action:

- Material Properties: Additional tests of the rubber bushings are required to establish material properties such as torsional stiffness, longitudinal stiffness and damping when the track is also subject to tensile loads. The material properties are believed to be very non-linear and should be incorporated into the track model to more accurately duplicate this important variable. We recommend these properties be measured using simple inexpensive bench tests.

- Model Validation: Analysis of several existing and prior suspension designs should be performed and the results compared to the measured vehicle performance and failure modes in order to validate the accuracy of the model and provide information for fine tuning the model, if necessary. Detailed measurements of track tension and suspension reaction forces are needed to compare with the model output.

- Additional analyses using the computer model are recommended to further investigate the effects of the different track/pin interface designs. Specifically, analyses of a dry steel on steel and lubricated bearing track/pin interfaces should be performed to evaluate the theoretical performance of these two design alternatives.

- A parametric analysis is recommended to evaluate the use of alternate materials in the track/pin bushing. Variations in stiffness and damping should be explored to determine whether a more rugged material can be substituted for the rubber bushings.

- An analysis of the M113 track substituting a conventional-type track suspension with small road wheels and track support rollers is recommended to establish a benchmark for comparison with the flat-track-type suspension currently used.

- Several parametric analyses are recommended in which suspension system details are systematically varied and studied. For example, in one such analysis, track pitch, drive sprocket diameter and idler wheel diameter would be varied while the other component sizes and material properties are kept constant. Also recommended is a parametric analysis in which the road wheel diameter is varied while the other component sizes and material properties are kept constant.

These parametric studies would provide insight and guidelines for track design and modification.

A detailed discussion of the proposed material testing, model validation testing and additional analyses will be included in our proposal for Phase II research and development under the SBIR program.

4.2. Additional Applications

Although not addressed by the problem definition, analyses can be completed using this analytical technique to support the development of fatigue resistant pins, lightweight tracks and improvements in track design as follows:

- An analysis in which the mass of the track shoe used in the model is reduced to represent an aluminum track can be used to evaluate the effects of the use of a lighter track. This analysis would address the demonstrated need for an understanding of aluminum track dynamics.

- An analysis in which the track pin diameter is increased (with corresponding changes in track rotational and longitudinal stiffness and damping) can be used to evaluate the effects of using a more fatigue resistant pin design. This analysis would address the demonstrated need for a more fatigue resistant pin design.

- Finally, track design modifications can be explored using the model to investigate the effects of design modifications to the track and suspension. Promising design modifications can be evaluated prior to fabrication of prototypes. The analytical model can be used to determine design loads for sizing these new components.

5.0. DISCUSSION

The M113 Armored Personnel Carrier, the tracked vehicle selected as the subject vehicle for this feasibility study, was first placed into service in 1960[1] with about 73,000 vehicles currently in service in 45 countries. The current version of the M113 is the M113A2, which carries an improved suspension over the original vehicle. The M113 is slowly being replaced by the M2 Bradley Infantry Fighting Vehicle. There are many variants of the M113, such as mortar vehicles, command vehicles and antiaircraft and missile launch vehicles, which have the same track and suspension design as the M113.

The M113 suspension and track design, shown in Figure 5-1, is of the flat-track-type[2]. There are 10 road wheels, each of which has its own torsion bar suspension spring. The two front road wheels and the two rear road wheels are also attached to shock absorbers. The drive sprocket is located in the front of the vehicle. The track is a reversible single-pin block and pin-type track. The pins use rubber bushings at the track/pin interface. The track block is constructed of

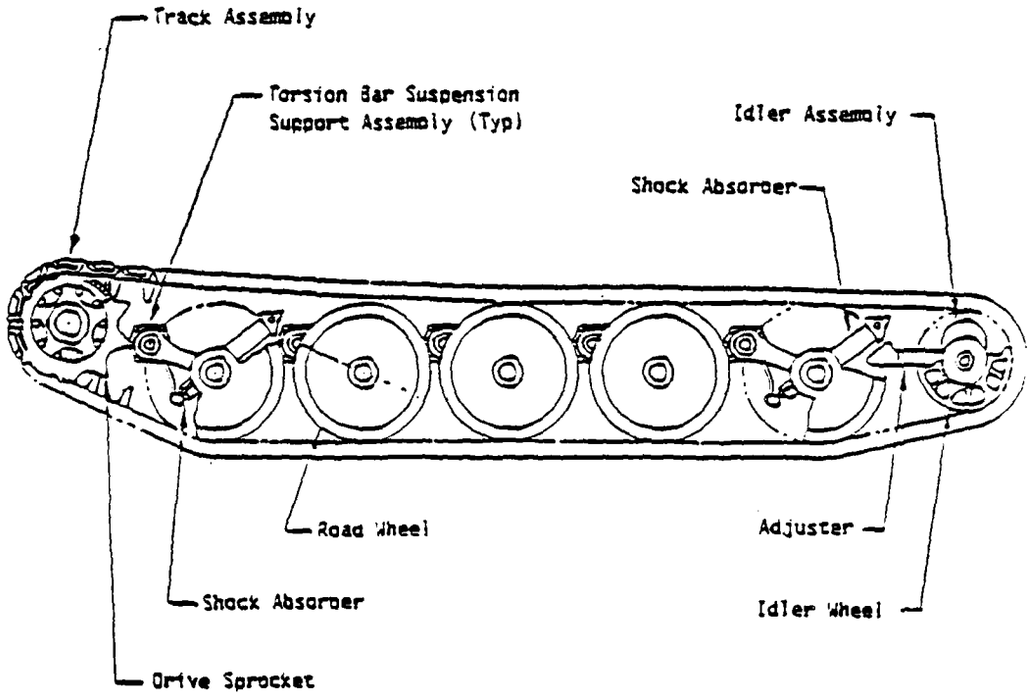


Figure 5-1. M113 Armored Personnel Carrier Track and Suspension

a steel frame with a rubber pad on the ground side. There are 65 track shoe assemblies on each track.

5.1. Background

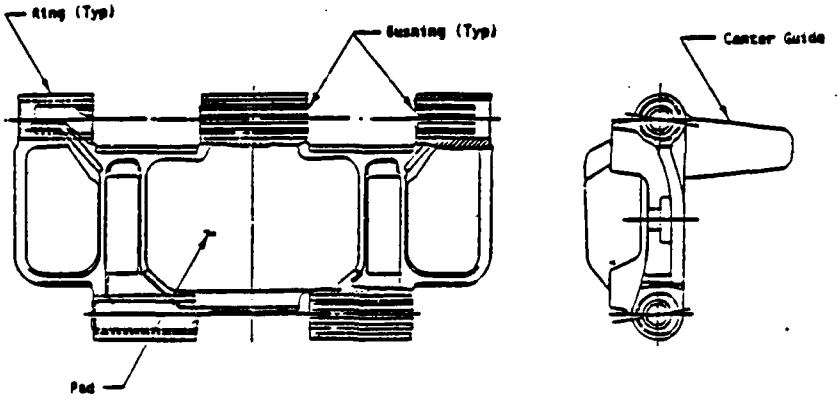
A brief general summary of different types of tracks and track/pin interfaces is presented in Appendix A. This information was compiled from a literature search and from an examination of the tracked vehicles on display at the Aberdeen Proving Ground Ordinance Museum. There are four basic types of tracks used for military vehicles[3,4]. These are the reversible block and pin track, irreversible block and pin track, band track, and spaced-link track. The analysis of track motion presented in this report only considers the reversible block and pin-track-type which is used in the M113 Armored Personnel Carrier. The two types of reversible block and pin tracks, the single-pin shoe and the double-pin shoe, are shown in Figure 5-2. The advantages and disadvantages of all of the track types are discussed in Appendix A to provide a basis for understanding the current preference for using the reversible block and pin-track-type in military vehicles.

In addition, there are four different pin/track interface designs for the block and pin track[4]. The advantages and disadvantages of these different interface designs are also discussed in Appendix A as this is the specific component in the block and pin track design addressed by the problem definition. Also, a brief discussion of the advantages and disadvantages of small and large road wheels is included.

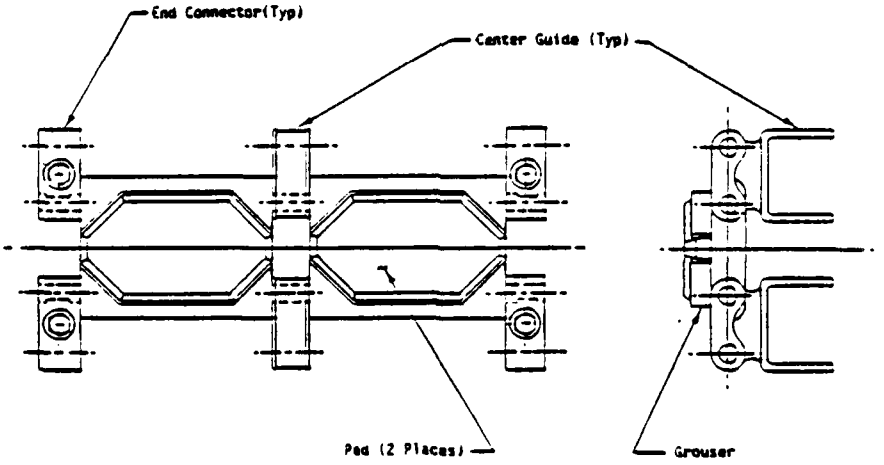
The principal method of measuring and comparing the performance of tracked vehicles on hard ground is the drawbar pull test in which a dynamometer is placed between the pulling tracked vehicle and the pulled vehicle[5]. The dynamometer is used to measure the drawbar pull force as a function of velocity. The drawbar pull force is equal to the difference between the tractive force and the resisting force of the pulling tracked vehicle. The tractive force is equal to the force delivered by the tracked vehicle power plant and transmission. The tracked vehicle resisting force is composed of the following force components:

- internal resistance of running gear which includes frictional losses in the track pins, driving sprocket teeth, sprocket hub, roadwheel running surfaces, and roadwheel bearings,
- resistance due to vehicle/terrain interaction,
- obstacle resistance,
- grade resistance, and
- aerodynamic drag.

To characterize the internal resistance component of the resisting force of military tracked vehicles on hard ground, the drawbar test is



(a) SINGLE PIN SHOE



(b) DOUBLE PIN SHOE.

Figure 5-2. Reversible Block and Pin Tracks

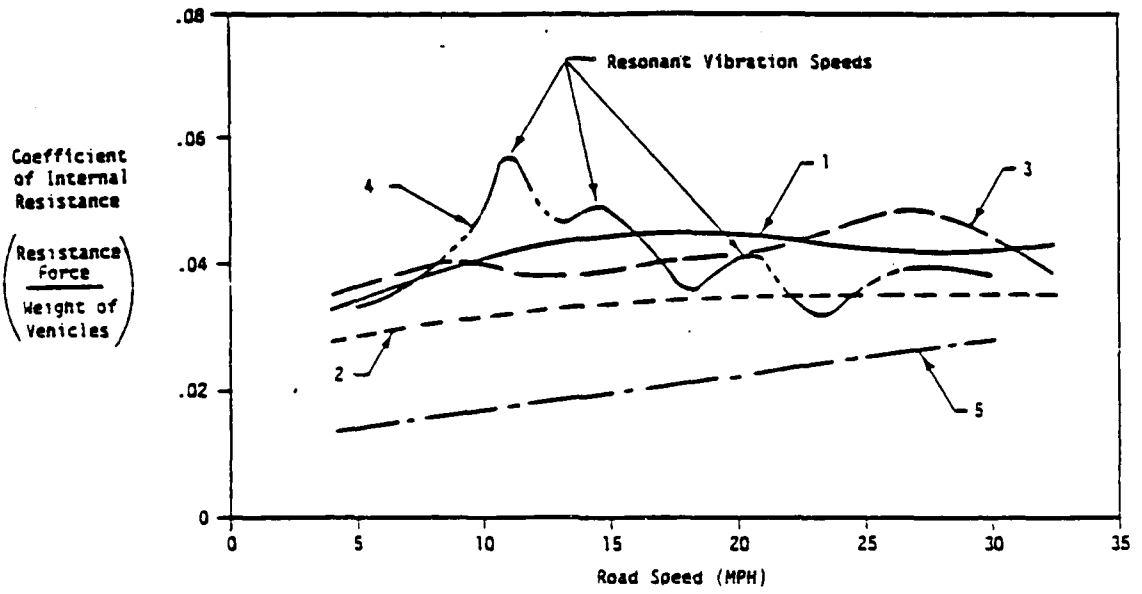
performed by towing the tracked vehicles with the dynamometer between the towing vehicle and the tracked vehicle[2]. The tracked vehicle's transmission is disconnected in this test to remove the effects of transmission efficiency. Drawbar pull force is again tabulated as a function of velocity and used to determine the coefficient of internal resistance (drawbar pull force divided by vehicle weight) as a function of velocity. Resistance-to-propulsion tests are also performed to characterize the internal resistance component of military tracked vehicles. In these tests, measurements of horsepower delivered to the drive sprockets are converted to a tractive force, and a corresponding coefficient of internal resistance as a function of velocity is determined for propulsion. Figure 5-3 illustrates the range of coefficients of internal resistance for several different track and track/pin interface designs. As shown in the figure, the coefficient of internal resistance is nonlinear with velocity. Peaks in the coefficient of internal resistance curves have been correlated with track vibration resonant frequencies. These resonances are particularly evident in resistance to propulsion test data.

5.2. Track Vibration

Many studies have been made of track vibration and its effects on military vehicle occupants and on military vehicle performance[6,7,8,9,10]. In the U. S., most research has concentrated on the reduction of track-vibration-induced noise inside the vehicle in an effort to improve working conditions for vehicle occupants. Early in the development of the M113 Armored Personnel Carrier the problem with noise was recognized as a result of both the track as a source of vibration and the use of aluminum body panels in the vehicle. The aluminum body panels were not stiffened and tended to respond to track vibration excitation.

Research completed in 1964 on the M113 indicates that the vehicle vibration driving forces were applied at the track sprocket engagement frequency[6]. Using a selective source removal technique, the chief source of vibration in the vehicle was determined to be the oscillating forces applied at the drive sprocket and track idler. At that time, use of a rubber-coated drive sprocket and track idler was found to reduce the transmission of the track vibration to the vehicle.
In 1976, an analytical study of vibration transmission from the track to the rear idler wheel was completed[7]. This study attempted to determine the importance of different parameters, such as idler wheel diameter, track shoe length and idler wheel suspension stiffness on the magnitude of track impact forces on the idler wheel. The study did not address the effects of the transverse vibrations which occur in the track suspended between the drive sprocket and the track idler (or track support rollers in a conventional suspension).

In 1979, a study of experimental idler designs for the M113 was again addressed primarily to the damping of hull vibration to reduce cabin noise to the point that would permit crewmembers to perform their duties without the use of hearing protectors[8]. This study also included the use of a track simulation program developed as a means to predict the



1. M113 Resistance to Towing, Single Pin Reversible Block and Pin Track with Rubber Bushings. Reference (2).

2. M109 Resistance to Towing, Double Pin Reversible Block and Pin Track with Rubber Bushings. Reference (2).

3. M109 Resistance to Propulsion, Double Pin Reversible Block and Pin Track with Rubber Bushing. Reference (2).

4. Resistance to Propulsion, Reversible Block and Pin Track with Dry Steel on Steel Track/Pin Interface. Reference (10).

5. Resistance to Towing, Reversible Block and Pin Track with Lubricated Pins Supported by Needle Bearings. This track also has overlapping road wheels for more even distribution of pressure in the soil under the tracks. Reference (10).

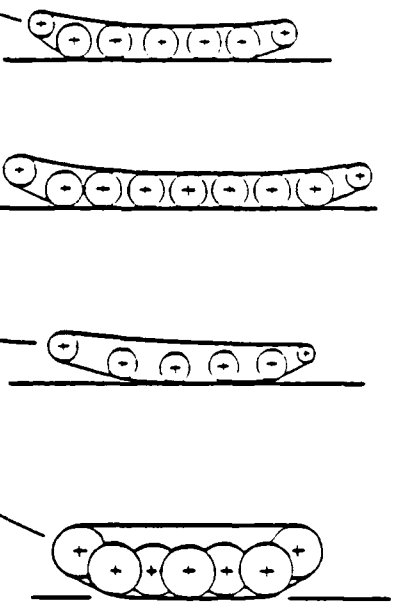


Figure 5-3. Motion Resistance of Several Track/Pin Interface Designs

effects of design changes in the track sprocket and track idler on interior noise levels. The program was developed to only include the drive sprocket, the track idler and the track, however, and did not include nonlinear material effects, road wheels, or track support rollers. Results of one computer simulation showed dynamic amplification of track tension due to resonant vibration by a factor of four. The study indicated that further development of the program was required to properly simulate track motion and to calculate reaction forces at the drive sprocket and track idler.

In 1984, preliminary development and testing of an aluminum track was completed[9]. This track was a reversible block-and-pin-type, single-pin, rubber-bushed track in which the steel block was replaced with an aluminum block which reduced the weight of a track assembly from 33 lb to 26 lb. Results of tests completed at that time show that some degradation of performance with respect to land acceleration and maximum speed was observed with the aluminum track. This degradation was attributed to a slight difference in drive sprocket diameter between the steel and aluminum tracks, but it is also possible that the resonant frequencies and response amplitudes of the aluminum track caused the increase in resistance to motion. One conclusion of this test program was that future track developments must take into account the dynamic behavior of the track and its interface components.

The problem with excessive vibration causing tractive energy dissipation has been more of a concern with users of dry steel on steel track/pin interfaces (i.e., outside of the United States)[10]. Research in the Soviet Union has been directed at methods of determining the resonant velocities of the track and operating the tracked vehicle at speeds away from resonance[11]. The classical mechanical vibrations method of calculating the natural frequencies of the track is to consider the track to be a string or chain in tension. The tension in the track is composed of the effects of deadweight and the centripetal force placed on the track at the contact with the driving sprocket. It is assumed that the vibration displacements are small so that the tension is constant and that there is no torsional stiffness in the track. It is also assumed that the track vibrates in only one plane (up and down) that the track is inextensible, and that there is no damping of the vibrations. The nomenclature and formulae for the classical method, illustrated in Figure 5-4(a), are as follows[12,13]:

Antisymmetric in-plane modes:

$$f_n = \frac{N}{L}\sqrt{\frac{T_t}{M}} \qquad N = 1, 2, \ldots K$$

Symmetric in-plane modes:

$$f_n = \frac{1.43}{L}\sqrt{\frac{T_t}{M}} \qquad N = 1$$

$$fn = \frac{2.46}{L}\sqrt{\frac{T_t}{M}} \qquad N = 2$$

$$fn = \frac{(2N + 1)}{2L}\sqrt{\frac{T_t}{M}} \qquad N = 3, \ldots K$$

where fn = natural frequency

T_t = horizontal component of track tension

$= T_s + T_d$

T_s = static horizontal component of track tension due to deadweight

$= \frac{q\,L^2}{8\,H}$

T_d = dynamic horizontal component of track tension due to track motion

$= MV_t^2$

q = weight/length = Mg

L = horizontal length of track span

H = static sag

V_t = velocity of the track

M = mass/length

g = gravitational acceleration

K = maximum mode possible which is limited by the number of track links in the span

= one half of number of free track links in the span

= drive sprocket impact frequency = V_t/P

P = track pitch

A symmetric in-plane mode is defined as one in which the vertical displacement component is symmetric about the center of the span, and vice versa. In the antisymmetric modes, no additional cable tension is induced by the motion of the cable based on the classical analyses of first order effects. In the symmetric modes, significant additional cable tension is induced by the motion of the cable. The above

equations can be solved for track velocities such that the track natural frequency is equal to the drive sprocket impact frequency. This is the resonant condition for drive sprocket impact excitation of the track. For the M113 track configuration, assuming no rotational stiffness at the track/pin interface (e.g., a lubricated pin supported by needle bearings), the natural frequencies calculated by this method for the antisymmetric and symmetric modes are shown in Table 5-1. Also shown in Table 5-1 are the corresponding vehicle speeds for the drive sprocket impact forces to excite these natural frequencies. Experimental research of vibration in chain drives has shown that vibration occurs at calculated natural frequencies and is caused by chain link impact forces at the drive sprocket.

Soviet research on track vibration also has identified additional resonant frequencies and track velocities which are based on establishing a traveling wave moving with and in the opposite direction to the track. This form of vibration may be caused by the centripetal force on the track as it passes over the track idler. For this wave motion, which appears to be a standing wave but is actually traveling, the magnitude of the wave velocity must be equal to a multiple of the track velocity in order to be reflected at the drive sprocket and the track idler. This is illustrated in Figure 5-4(b). The nomenclature and formula for the standing wave calculation, which were verified by lab tests of track[11] are as follows:

V_w = wave velocity = $m\ V_t$ at resonance

m is an integer 2, 3 ...

$$V_w = \sqrt{\frac{T_t}{M}}$$

$$m\ V_t = \sqrt{\frac{T_s + M\ V_t^2}{M}}$$

$$V_{resonance} = \sqrt{\frac{T_s}{M(m^2-1)}}$$

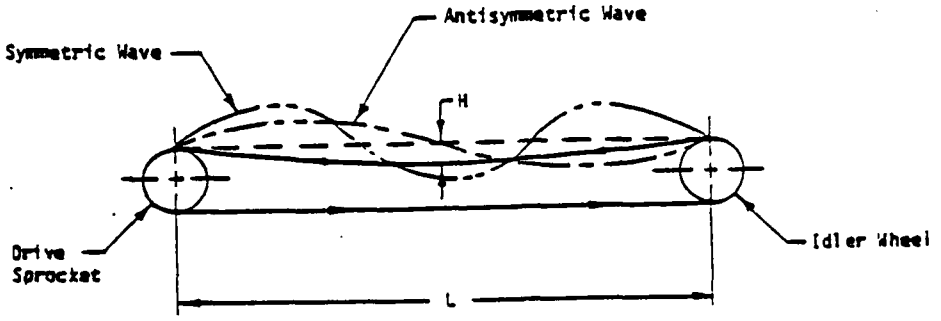
Table 5-2 tabulates the wave frequencies and corresponding track velocities for stable track standing waves, assuming no rotational stiffness at the pin/track interface. As shown in the table, several resonant track velocities calculated by this standing wave method are concurrent with track sprocket impact velocities which would excite symmetric or antisymmetric modes of vibration calculated by the suspended chain method. Tension measured in the track vibration tests referenced above showed a dynamic amplification factor of three at standing wave resonance. This implies that the standing waves are of a symmetric mode of vibration.

Apparently, part of the solution to the standing waves in Russian track design has been to operate with a low static tension in the track.

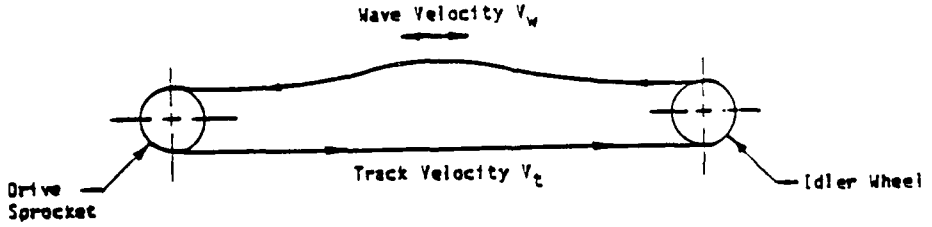
Table 5-1. Calculated Symmetric and Antisymmetric Natural Frequencies for the Vibration of the M113 Armored Personnel Carrier Track Treated as a Suspended Chain

Symmetric Modes			Antisymmetric Modes		
Mode	Natural Frequency (Hz)	Vehicle Speed for Track Sprocket Impact Excitation (MPH)	Mode	Natural Frequency (Hz)	Vehicle Speed for Track Sprocket Impact Excitation (MPH)
1	10.0	3.4	1	7.0	2.4
2	16.8	5.9	2	13.9	4.8
3	24.5	8.4	3	21.0	7.2
4	31.7	10.8	4	28.1	9.6
5	39.1	13.3	5	35.4	12.1
6	46.6	15.9	6	42.8	14.6
7	54.4	18.6	7	50.5	17.2
8	62.5	21.3	8	58.4	19.9
9	70.9	24.2	9	66.6	22.7
10	79.7	27.2	10	75.2	25.6
11	89.0	30.3	11	84.3	28.7
12	98.9	33.7	12	93.9	32.0
13	109.6	37.4	13	104.2	35.5

Note: A static tensile force of 10,750 lb. was assumed for the M113 track due to pretensioning and deadweight. L is assumed to be 156.75 in. Lower static tension would reduce the natural frequencies and corresponding vehicle speeds for track sprocket excitation.



(a) Classical Vibrating String/Chain Method



(b) Classical Traveling Wave Method

Figure 5-4. Nomemclature for Classical Analysis of Track Vibration

Table 5-2. Calculated Resonant Track Velocities For Stable Standing Waves in the Suspended Portion of the M113 Armored Personnel Carrier Track

Wave Velocity Integer	Track Velocity (MPH)
2	35.7
3	21.9
4	16.0
5	12.6
6	10.5
7	8.9
8	7.8
9	6.9
10	6.2

Note: A static tensile force of 10,750 lb. was assumed for the M113 track due to pretensioning and deadweight. Lower static tensin would reduce the resonant track velocities.

Photographs of Soviet tanks[1] show either significant track sag in flat-track-type suspensions or the use of several track support rollers to reduce static tension in conventional-type suspensions. This shifts the resonant track velocities down and reduces high-speed vehicle resistance to propulsion. The problem with this strategy with respect to flat-track-type suspensions is that relatively loose track is more likely to be "thrown" (disengaged from the drive sprocket) when traversing rough terrain. On the other hand, the use of the conventional-type suspension with several track support rollers increases the motion resistance at all speeds.

The actual M113 track/pin interface is a rubber bushing with torsional stiffness and damping. The rubber bushing is preloaded during installation to provide an interference fit between the pin and the track. Rotation at the track/pin interface is accommodated by torsional deformation of the rubber bushing. These rubber bushings change the track natural frequencies and make the track behave less like a suspended string or chain in tension. The longitudinal stiffness of the track is nonlinear and dynamic track tension is not uniform. The use of rubber-bushed pins in block and pin track also reduces the response of the track, when the vehicle passes through speeds which would otherwise excite the track, by damping the track vibrations, because the rubber bushings dampen the vibrations by energy absorption in the hysteresis of the rubber. The classical method of calculating the natural frequencies of the track and track tension cannot satisfactorily explain rubber bushed track/pin behavior. In addition, these methods are not sufficient for evaluating designs of improvements and modifications to the M113 tracks.

5.3. Field Observations of Track Vibratory Motion

On 19 October 1987, three MPR engineers were guests of TACOM's Aberdeen Proving Ground Liaison Officer, George C. Poteet, to witness field tests of tracked vehicles on the Perryman vehicle test courses at Aberdeen. During this visit several vehicles were observed on the test courses: an M109 self-propelled howitzer, an M2 Bradley Fighting Vehicle, an M1 main battle tank and an M548 cargo carrier. The M109 and the M548 did not have mud guard cowlings over the suspended portion of the track and it was possible to observe the track vibratory motion of these vehicles. (Note: The M548 has the same suspension as the M113.) The M109 uses the double-pin reversible block and pin track, and the M548 uses the single-pin reversible block and pin track.

No low-frequency resonant vibration of the suspended track caused by sprocket impact forces was observed in the operation of these vehicles. High-frequency or low-amplitude vibration of the tracks (with respect to what can be detected by the naked eye from a distance) was also occurring, but could not be quantified. Track vibration was observed when lower frequency modes were excited by suspension/soil interaction over rough terrain. The suspension/soil interaction caused a variation in track tension which resulted in a "snapping" of the track. This vibration was quickly damped out by the forward motion of the track and

did not appear to form a standing wave. MPR personnel also viewed a film which documented M113 vehicle tests on the Perryman course. This film showed visual track vibration to be the result of excitation of the lower modes of vibration as a result of suspension/ground interaction.

In both the field-observed and film-documented vehicle tests, the vehicles appeared to have fresh track without excessive wear on the track pads and the track bushings. As a result, this field-observed behavior is not unexpected and is in keeping with the intent of the rubber-bushed track/pin interface design which prevents standing waves from forming by rubber hysterisis damping. The main conclusions of these observations are as follows:

- In addition to resonant vibrations caused by drive sprocket impact and track centripetal forces, tracks experience vibrations from suspension/soil interaction.
- Significant damping is present in the track so results of an analytical model of the present track configuration may show standing waves.
- A model capable of a time history solution is required to account for suspension/soil interaction in the design of improvements and modifications to the track.

5.4. Rubber-Bushed Track/Pin Interface Material Properties

Actual rubber-bushed track/pin interface material properties such as rotational stiffness and damping were required for use as input data in the development of the analytical model. Appendix B documents the measurement of torsional stiffness and percent of critical damping in a rubber-bushed T130 track/pin assembly which is the type used on the M113 Armored Personal Carrier. Based on the results of these tests, the torsional stiffness of the interface is 3,700 in-lb/radian and the rubber bushing provides 11.8% of critical damping. These properties were incorporated into the analytical model described below.

5.5. Analytical Model of Track

In order to demonstrate the solution of the equations which describe the motion of the track and suspension of a tracked vehicle, a computer program was written to solve those equations and a sample preliminary analysis was accomplished. The analytic approach used for this computer program is discussed below and preliminary results obtained using this computer program are described.

5.5.1. Analytic Approach. The track and suspension of a tracked vehicle as used in the computer model are shown in Figure 5-1. The computer model includes the vehicle as a rigid body with mass and rotational inertia which can translate in two directions and can rotate about the axis normal to those two directions when responding to the forces and moments which act on it. Forces acting on the vehicle include forces from the wheels, wind resistance, and gravity. The road

wheels, drive sprocket, and idler wheel are modeled as attached to the vehicle as shown in Figure 5-5. The forces between these wheels and the vehicle are expressed as functions of the relative displacement and velocity of the wheels with respect to the vehicle. Each wheel has mass and rotational inertia and its motion is governed by the forces imposed on the wheel from the track, from the interaction of the wheel with the main vehicle, and from gravity. The forces and moments acting on the drive sprocket, idler wheel and road wheels are shown in Figure 5-5. The track is modeled as a number of shoes, each of which is free to move in two directions and free to rotate about an axis normal to these two directions. Forces and moments acting on each shoe as included in the model are shown in Figure 5-6. These include the force due to gravity, forces on the ends of the shoe due to the relative position of neighboring shoes, and forces of interaction with the wheels and the ground if the shoe is in position to contact a wheel or the ground. The ground is modeled as a surface described by a series of line segments, and a force normal to this surface is imposed on any track shoe which interferes with the surface.

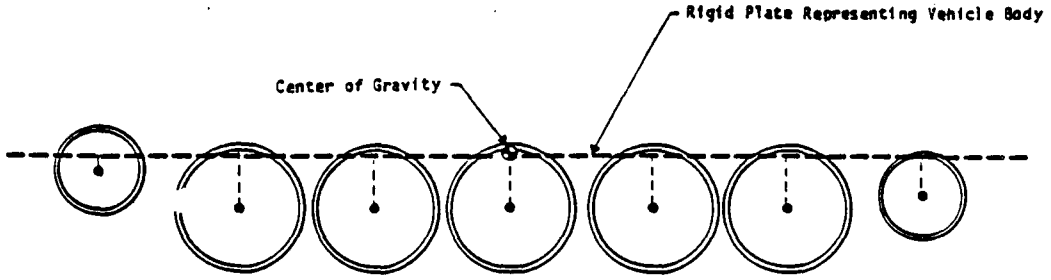
Since the response of the track is significantly more complicated than the response of the wheels and the vehicle, a two-step approach was used to integrate the system of equations which describes the motion of the shoes, the wheels, and the vehicle. The equations of motion for the track shoes are solved using a fully implicit backward difference technique by assuming the boundary conditions imposed by the wheels and the ground are constant over the time interval. In the second step of the solution for a time interval, the positions and velocities of the wheels and vehicle are revised by explicitly integrating the equations of motion for the wheels and the vehicle while the position of the shoes is assumed fixed. The small time interval required to ensure a stable solution for the track part of the analysis is considered limiting and the equations of motion of the wheels and vehicle are integrated explicitly.

To allow flexibility in modeling the interaction of the components making up the track and suspension, stiffness and damping are entered into the program as force versus displacement and force versus velocity curves, respectively. Consequently, nonlinear effects in the bushings between track shoes and between the tracks and the wheels or the tracks and the ground could be included in the model.

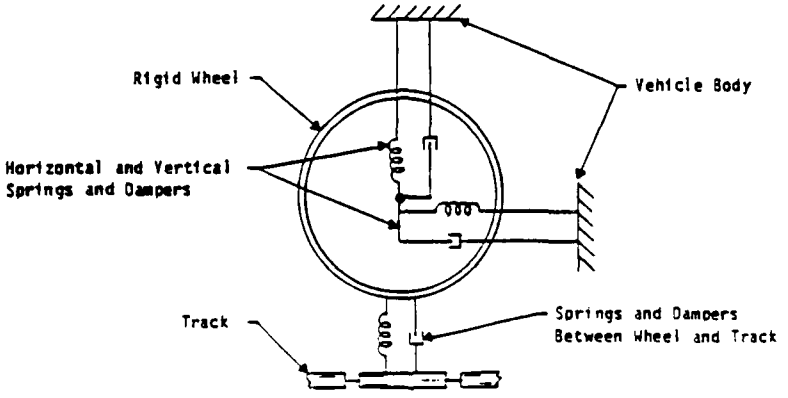
5.5.2. Equations of Motion for Components. Each component in the system (vehicle, wheel, track shoe) has three degrees of freedom and three corresponding equations of motion.

$$m \frac{d^2 x}{dt^2} = F_x \qquad m \frac{d^2 y}{dt^2} = F_y \qquad I \frac{d^2 \theta}{dt^2} = M$$

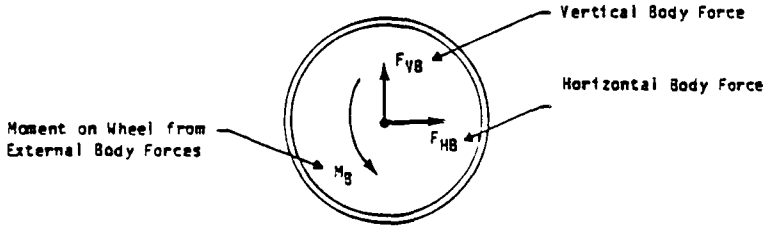
Where: x is the x coordinate of the component



(a) SUSPENSION CONNECTIVITY

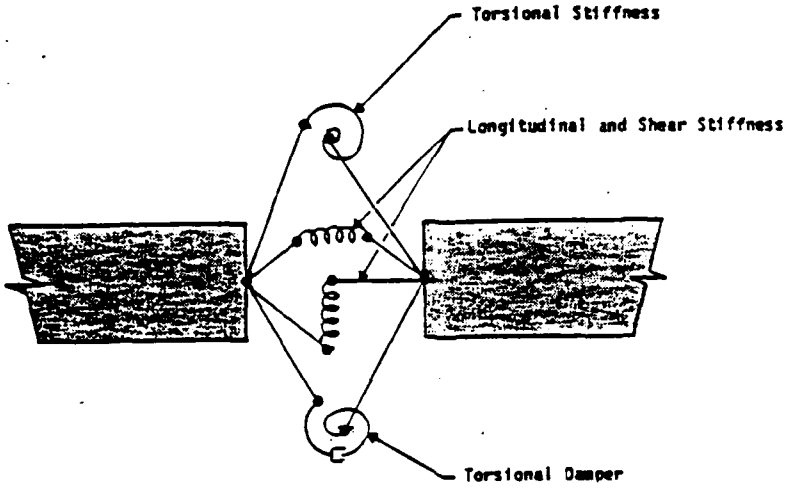


(b) TYPICAL WHEEL STRUCTURE

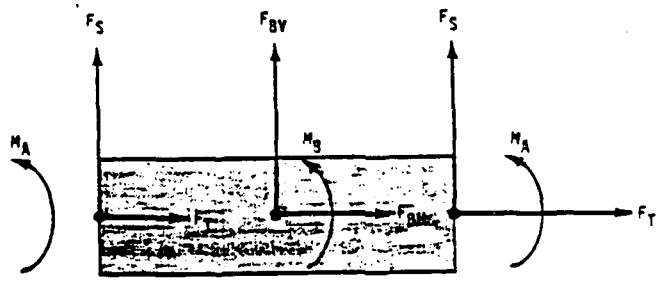


(c) TYPICAL WHEEL FORCES AND MOMENTS

Figure 5-5. Forces and Moments Acting on Drive Sprocket, Idler Wheel and Roadwheels



(a) TYPICAL TRACK PIN INTERFACE STRUCTURE



F_{BH} = Horizontal Body Force
F_{BV} = Vertical Body Force
F_S = Shear Force from Adjoining Shoe
F_T = Tensile Force from Adjoining Shoe
M_A = Applied Moment from Adjoining Shoe
M_B = Moment from External Body Forces

(b) TYPICAL TRACK FORCES AND MOMENTS

Figure 5-6. Forces and Moments Acting on Each Track Shoe in the Analytical Model

y is the y coordinate of the component
θ is the angular rotation of the component
F is a force
M is a moment
t is time
m is mass
I is rotational mass moment of inertia

In these equations, the forces and moments are functions of the positions, rotations, velocities, and angular velocities of the components. When this dependence is expressed explicitly, the system of equations of motion can be written as a single vector equation as follows.

$$\frac{d^2U}{dt^2} = f\left(U, \frac{dU}{dt}, t\right)$$

Where: $$U = \begin{bmatrix} x_1 \\ y_1 \\ \theta_1 \\ . \\ . \\ . \\ x_n \\ y_n \\ \theta_n \end{bmatrix}$$

This system of 3n second order differential equations can be written as 6n first order differential equations by adding the two linear velocities and one angular velocity for each of the n components as a degree of freedom. The resulting system of 6n equations is solved in the computer program using a fully implicit finite difference method.

Due to the significant computer time required to solve 6n equations in 6n unknowns when n is typically in the order of 70 to 80, the problem was reduced significantly by banding the matrix of coefficients. For this reason, the equations of motion for the vehicle and the wheels are

removed from the system of equations described above, and the equations of motion for the track is solved independently.

5.6. Summary of Results of Analyses Using Model

The analytic technique described above was incorporated into a computer program and was tested on several sample problems. The purpose of these sample problems was to demonstrate that the complex system of differential equations which represents the track and suspension of a tracked vehicle could be integrated, providing reasonable and stable results. A computer generated plot of the track and suspension used for these sample problems is shown in Figure 5-7 as it was plotted on the screen of an IBM personal computer. This plot shows an approximate model of the M113 Armored Personnel Carrier. The shaded portion at the bottom of the model represents the ground which was entered as perfectly flat terrain.

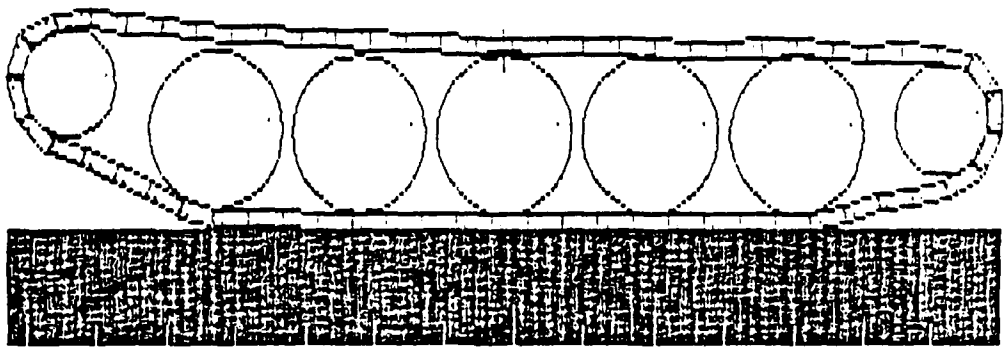
The initial problem evaluated using the model was a severe and unrealistic case where large loads occurred in the track and suspension as a result of poor initial conditions. The purpose of this analysis was to test the numerical stability of the solution technique under "extreme" conditions. A severe interference was entered between the first road wheel and the track shoe below it. This interference generated a force on the track and the road wheel which caused them to move apart as is shown in Figure 5-8 through 5-12. The track begins to move back to its proper shape as the transient progresses. This analysis was also used to define the time step under which the solution remains stable under these severe conditions. As a result of several trial and error computer runs, a time step on the order of about a tenth of a millisecond was chosen. We believe that this time step can be increased to provide a quicker computer solution time in Phase II research and development.

The problem was restarted using initial conditions in which the interference was removed and the speed of the vehicle was maintained at 10 miles per hour. The transient was run for 1,600 time steps. Appendix C contains sample input and output from this analysis. Figure 5-13 through 5-29 show time history displacement snapshots obtained during the transient. Some wave motion appears in the track during the latter part of the transient.

Figures 5-30 through 5-37 show track tension as a function of time for several track shoes around the suspension. The calculated track tension is not a constant but fluctuates with frequencies ranging from 20-60 Hz. The magnitude of the calculated dynamic peak tensile forces are much greater than would be obtained using a static approach to balancing track deadweight and centripetal forces.

Figures 5-38 and 5-39 show the net forces on the drive sprocket in horizontal and vertical directions, respectively. The effect of the track impacting on the drive sprocket can be seen in these figures. The oscillations of the forces die out due to damping. The frequency of the

TEST CASE FOR PERSONNEL CARRIER AT 10 MPH



Scale in Feet

X-CG: -1.7799 Y-CG: 25.9877 ANGLE: 0.0002
PROGRAM: TRV

Press Q to Quit, Any Other Key for Next Plot

Figure 5-7. Computer Generated Plot of the Track an Suspension as Plotted on the Screen ofan IBM Personal Computer

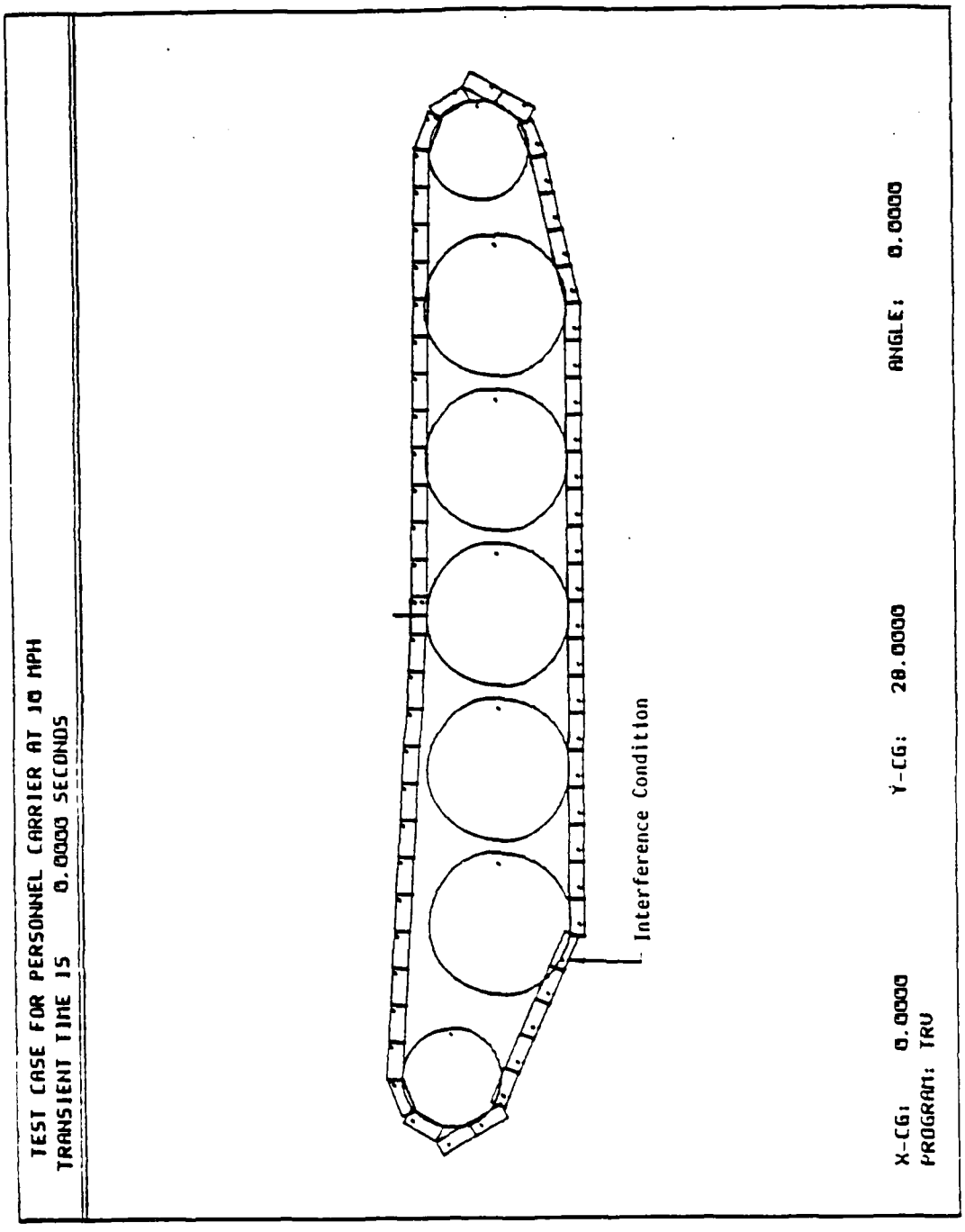


Figure 5-8. Numerical Stability Test Case for a Personnel Carrier at 10 MPH, Time = 0.000 seconds

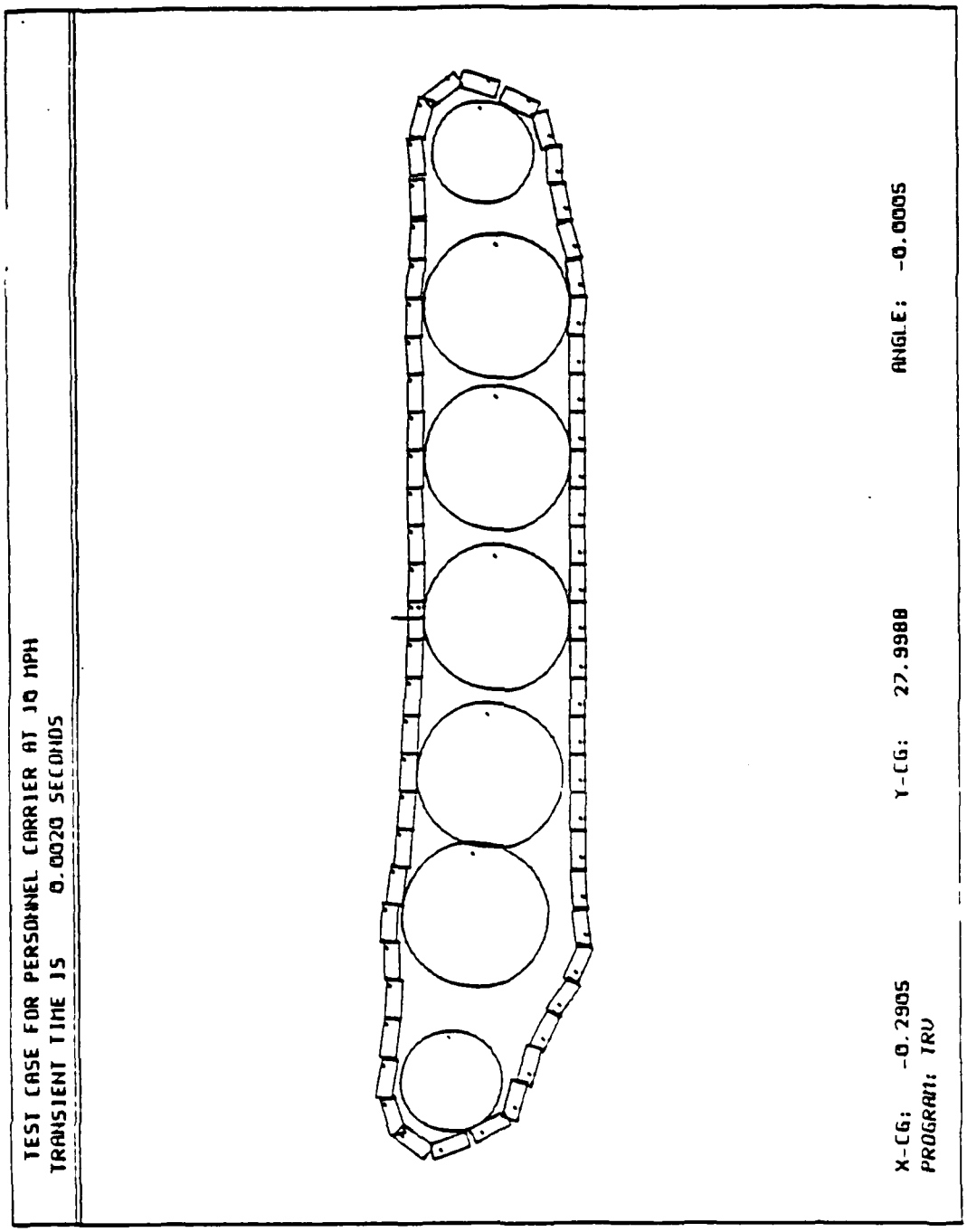


Figure 5-9. Numerical Stability Test Case for a Personnel Carrier at 10 MPH, Time = 0.002 seconds

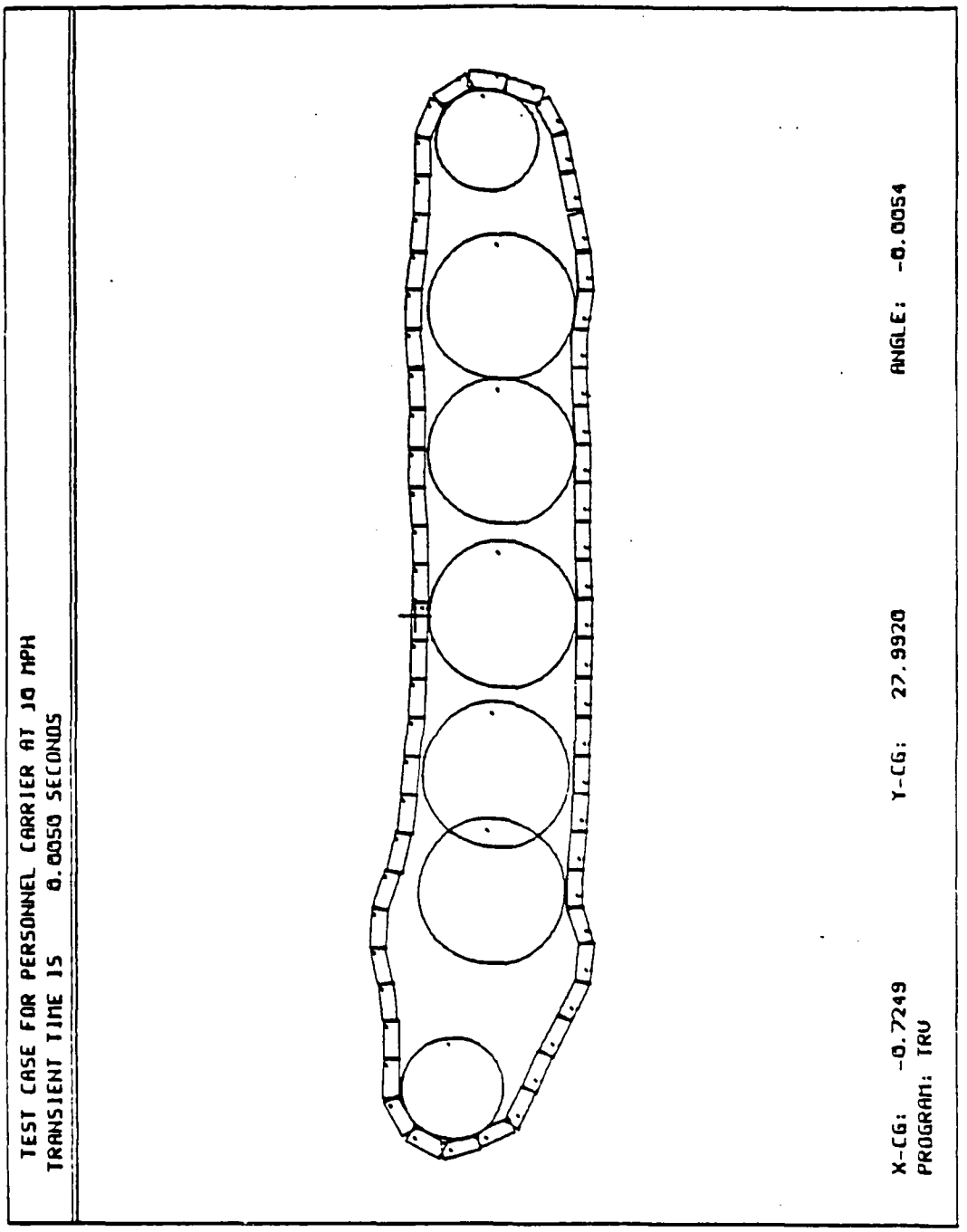


Figure 5-10. Numerical Stability Test Case for a Personnel Carrier at 10 MPH, Time = 0.005 seconds

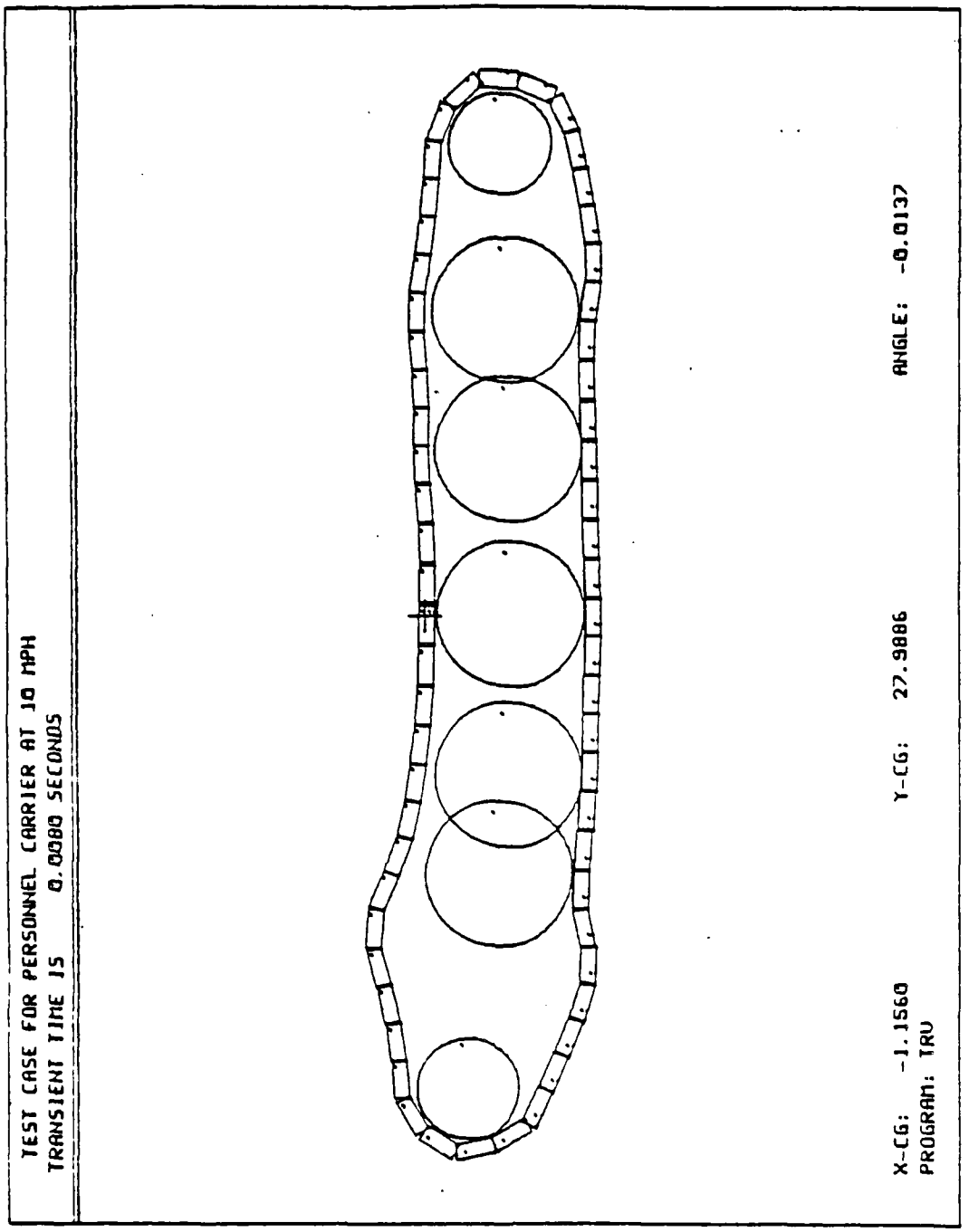


Figure 5-11. Numerical Stability Test Case for a Personnel Carrier at 10 MPH, Time = 0.008 seconds

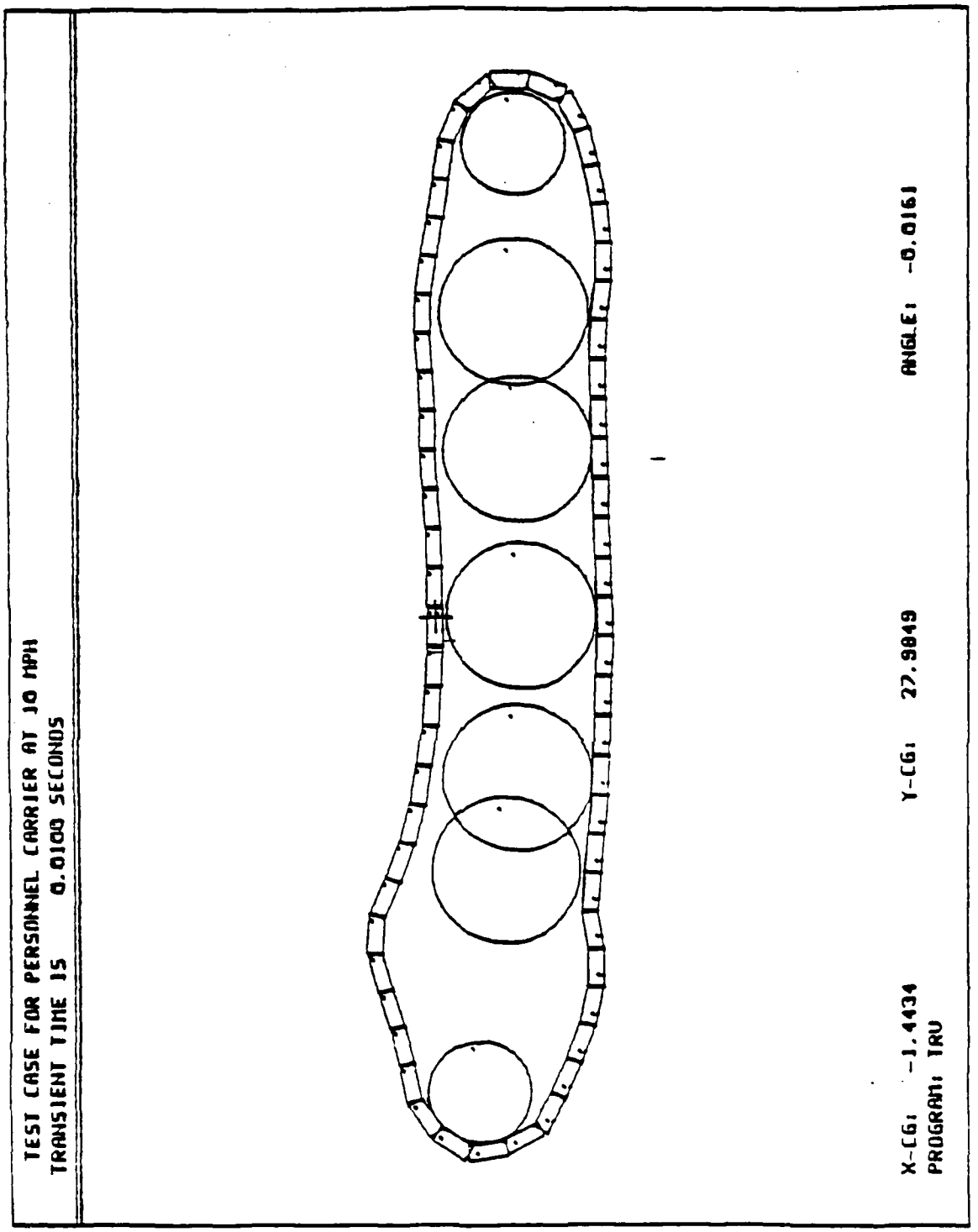


Figure 5-12. Numerical Stability Test Case for a Personnel Carrier at 10 MPH, Time = 0.010 Seconds

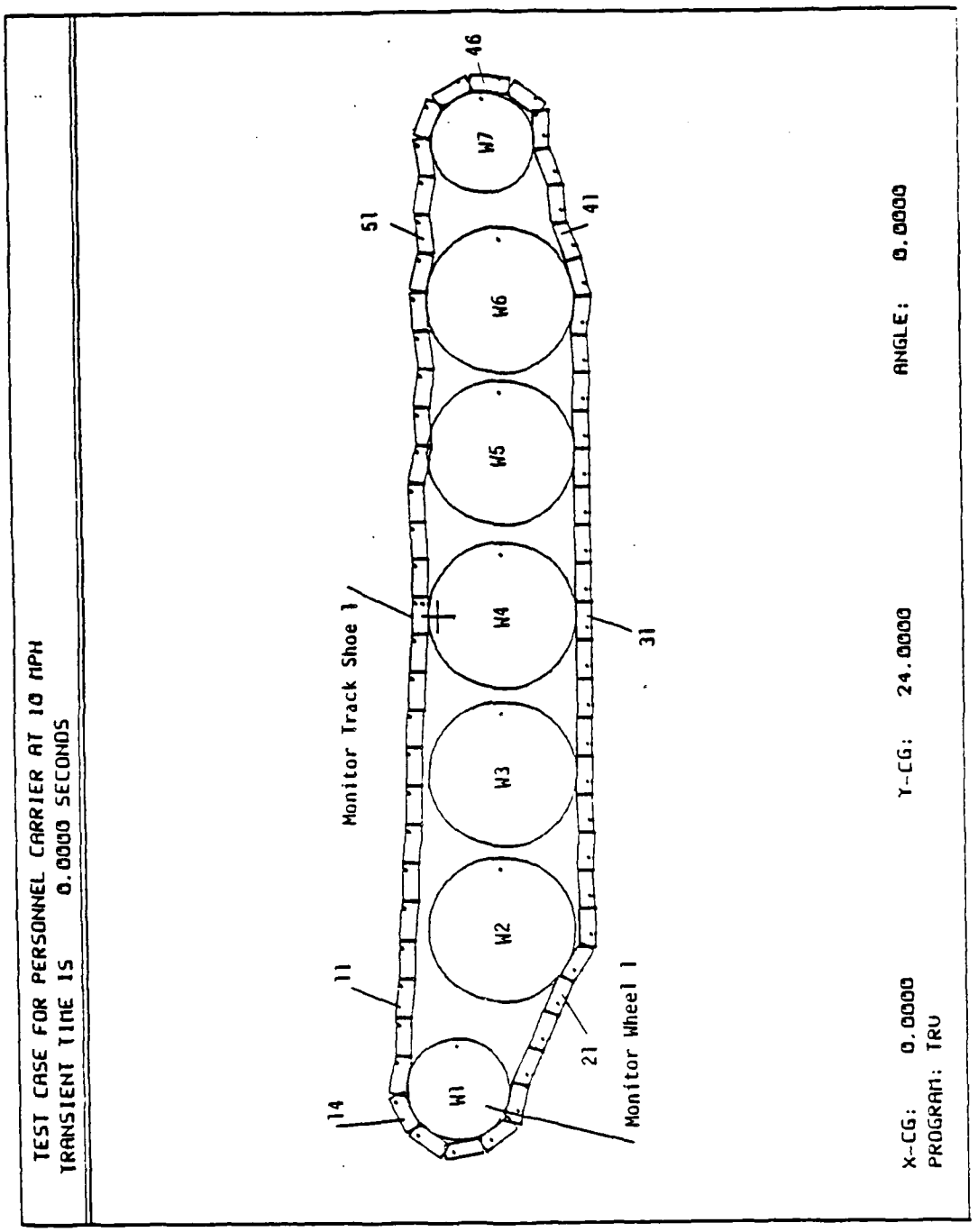


Figure 5-13. Test Case for a Personnel Carrier at 10 MPH, *Time = 0.00 Seconds*

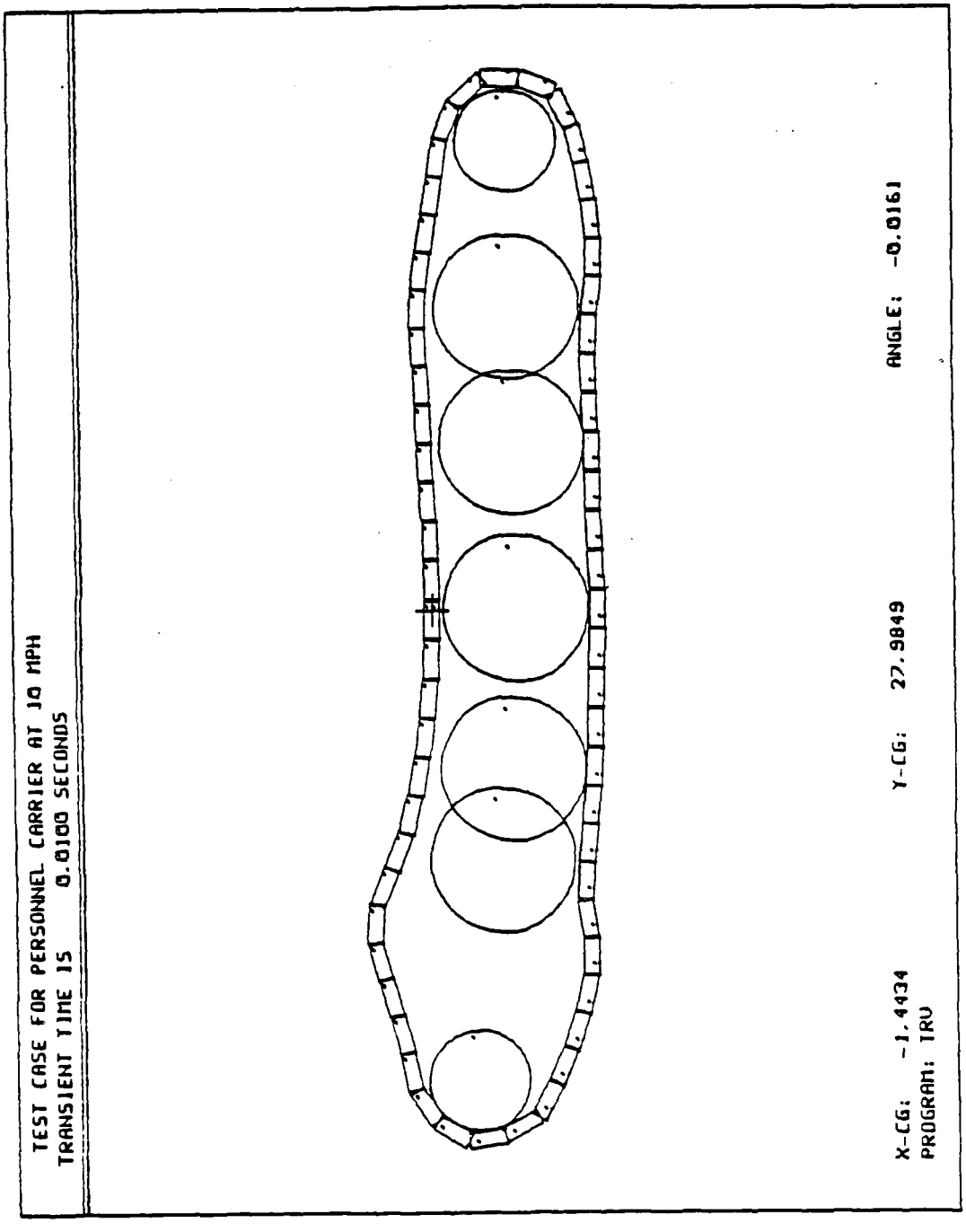


Figure 5-14. Test Case for a Personnel Carrier at 10 MPH, Time = 0.01 Seconds

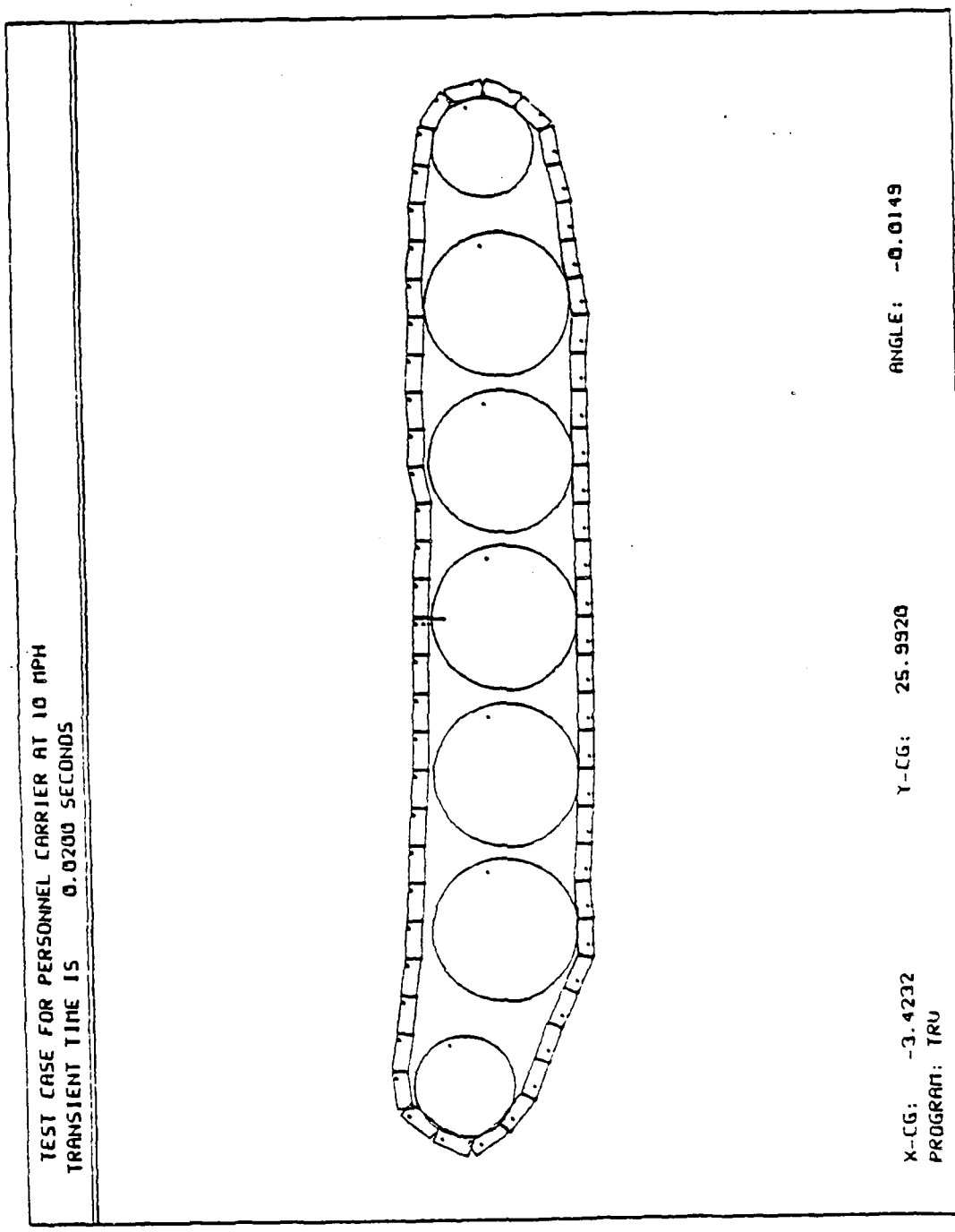


Figure 5-15. Test Case for a Personnel Carrier at 10 MPH, Time = 0.02 Seconds

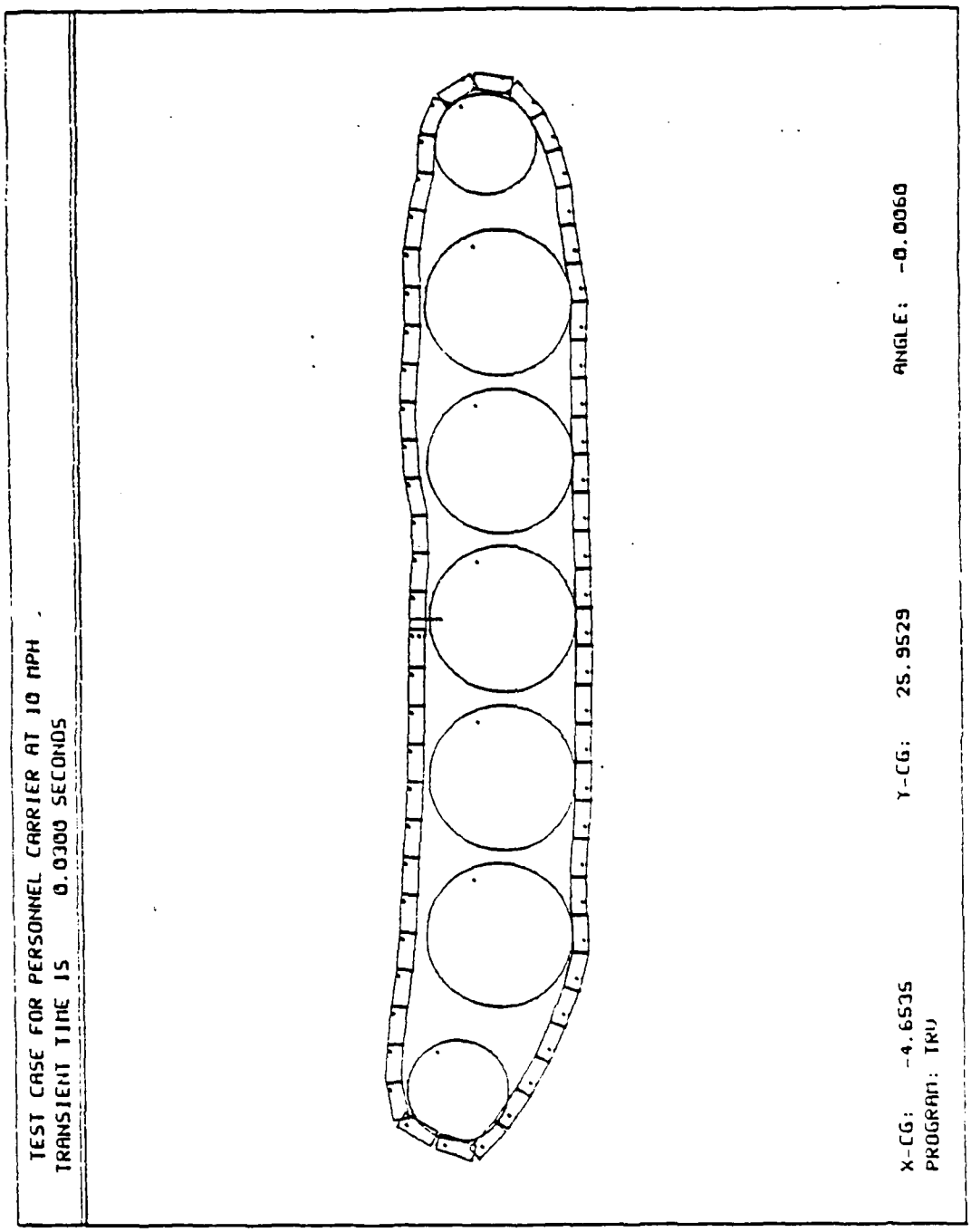


Figure 5-16. Test Case for a Personnel Carrier at 10 MPH, Time = 0.03 Seconds

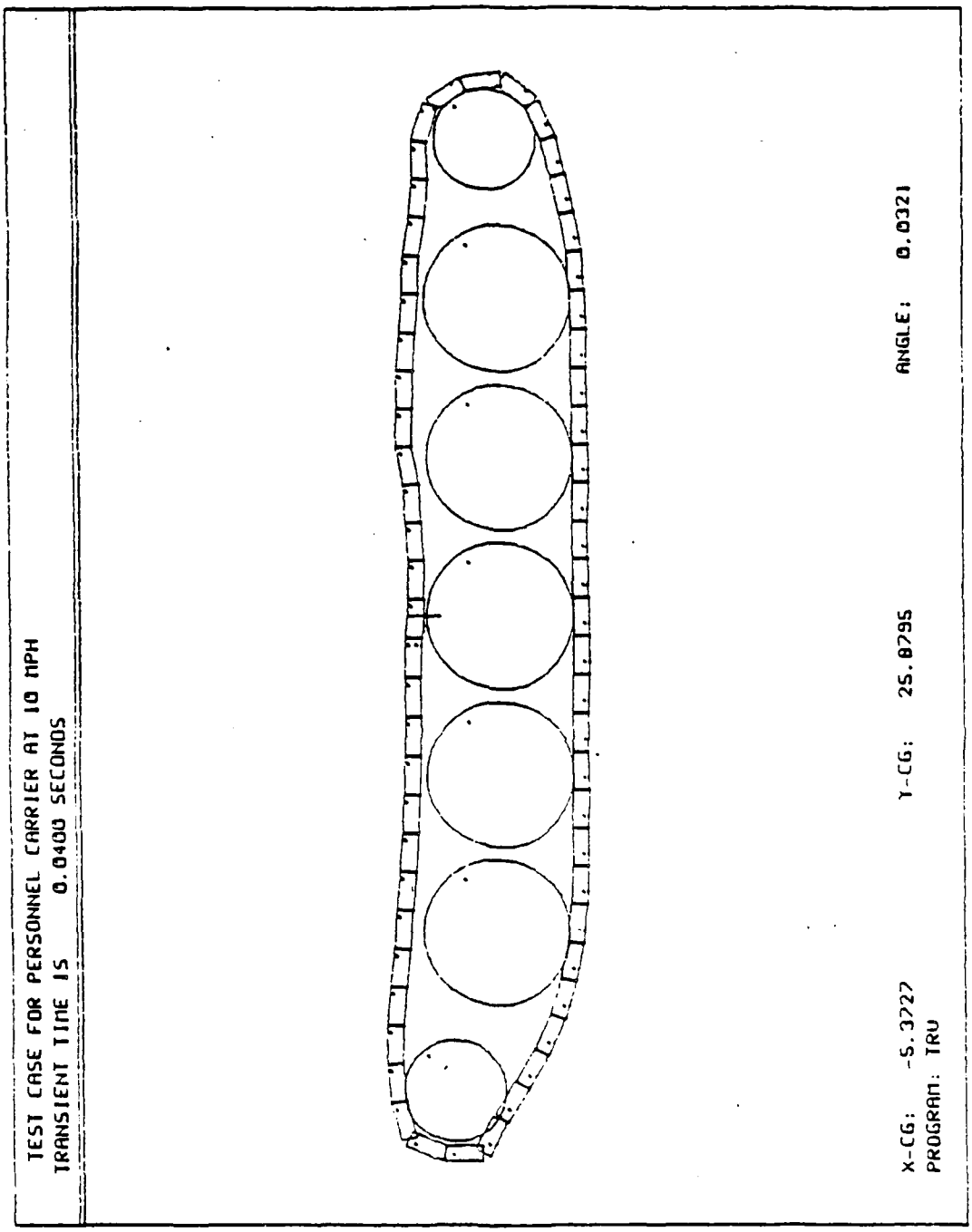


Figure 5-17. Test Case for a Personnel Carrier at 10 MPH, Time = 0.04 Seconds

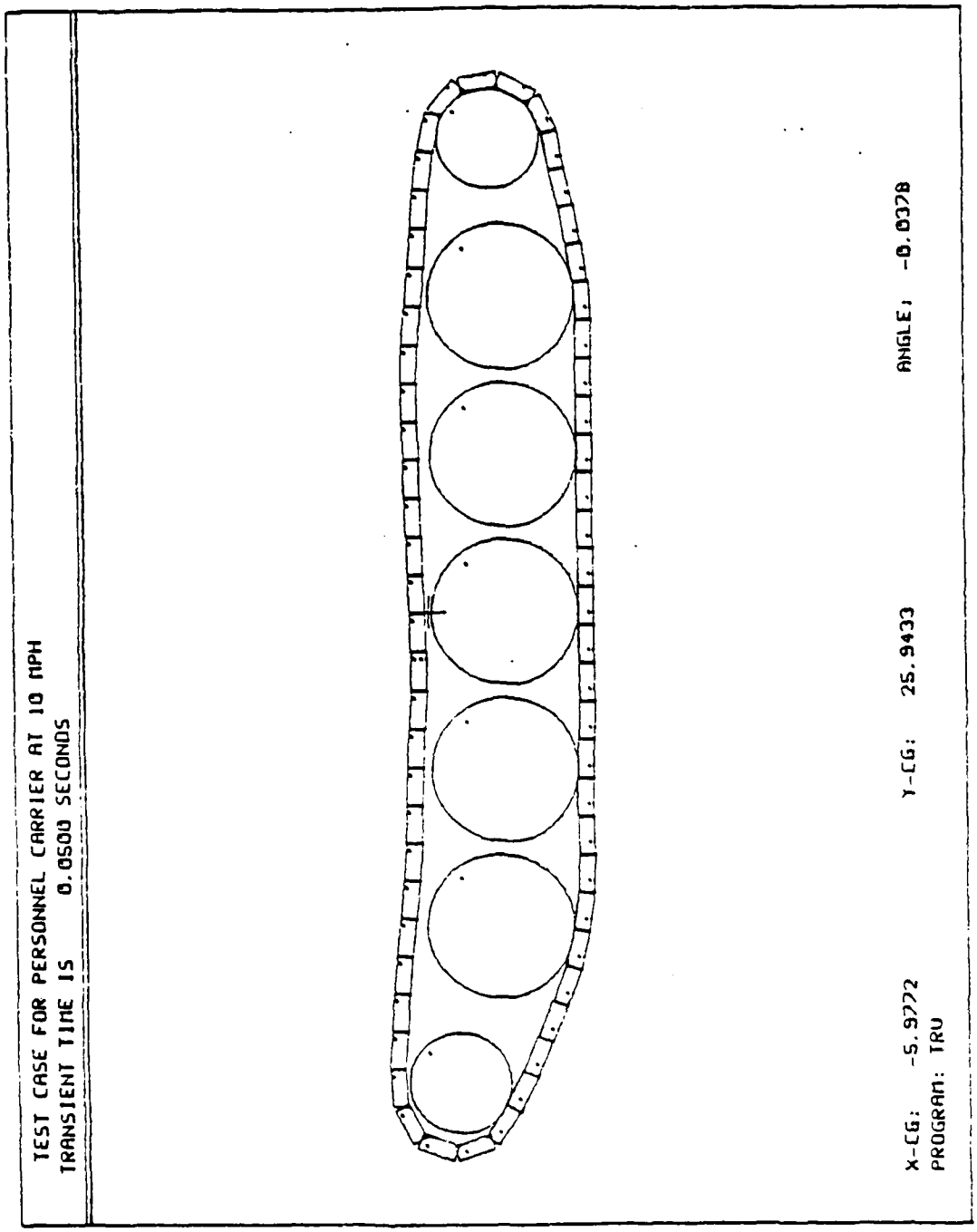


Figure 5-18. Test Case for a Personnel Carrier at 10 MPH, Time = 0.05 Seconds

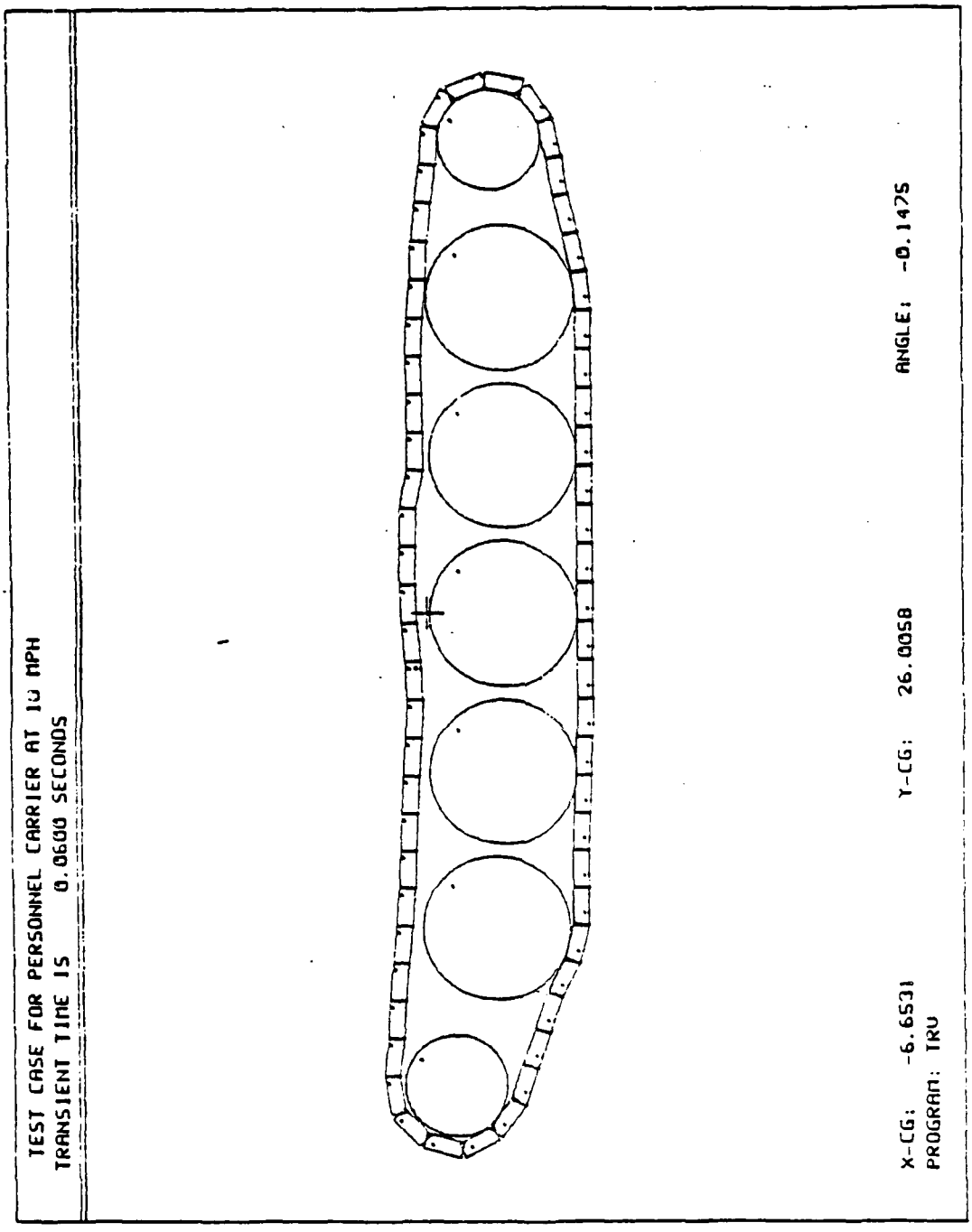


Figure 5-19. Test Case for a Personnel Carrier at 10 MPH, Time = 0.06 Seconds

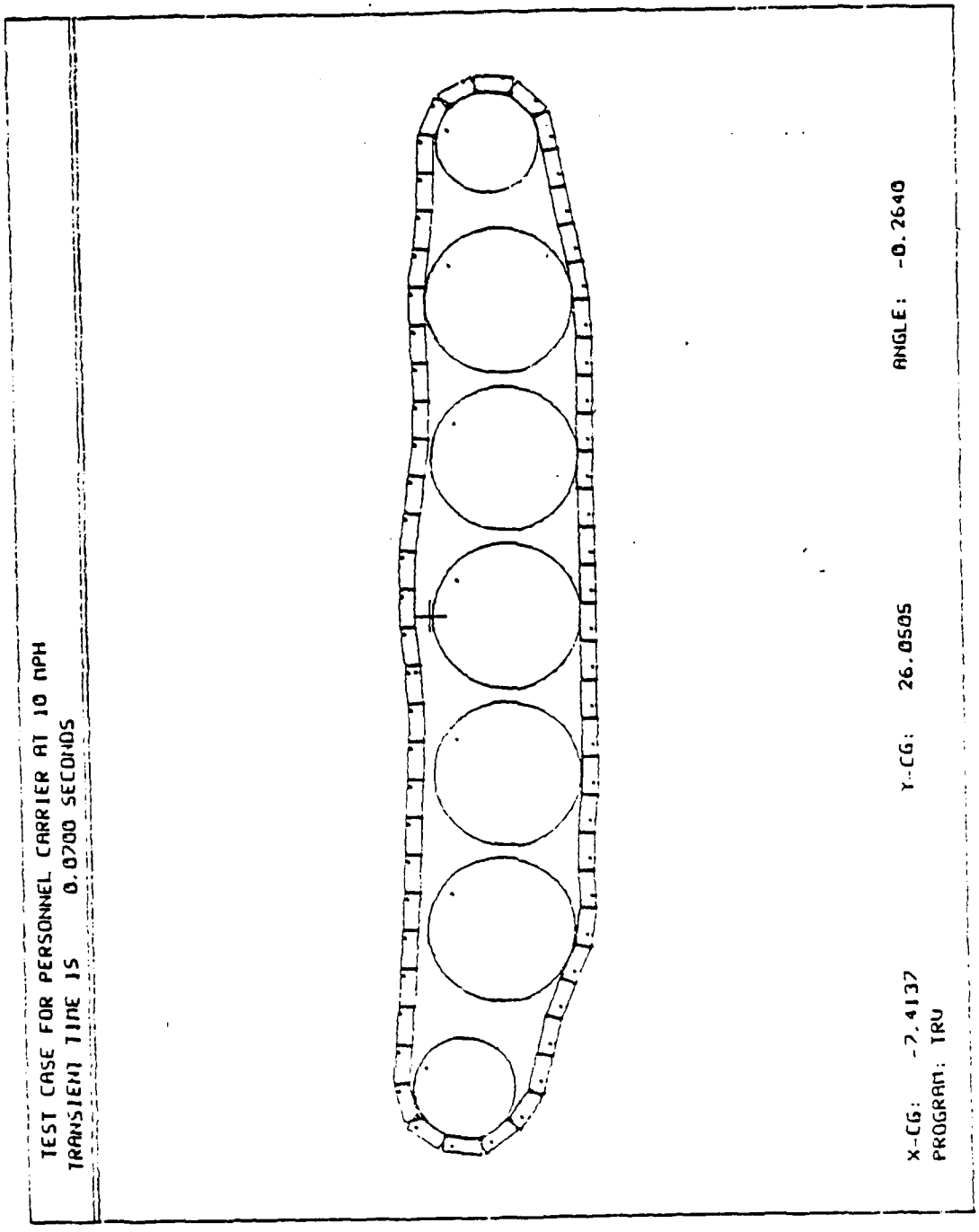


Figure 5-20. Test Case for a Personnel Carrier at 10 MPH, Time = 0.07 Seconds

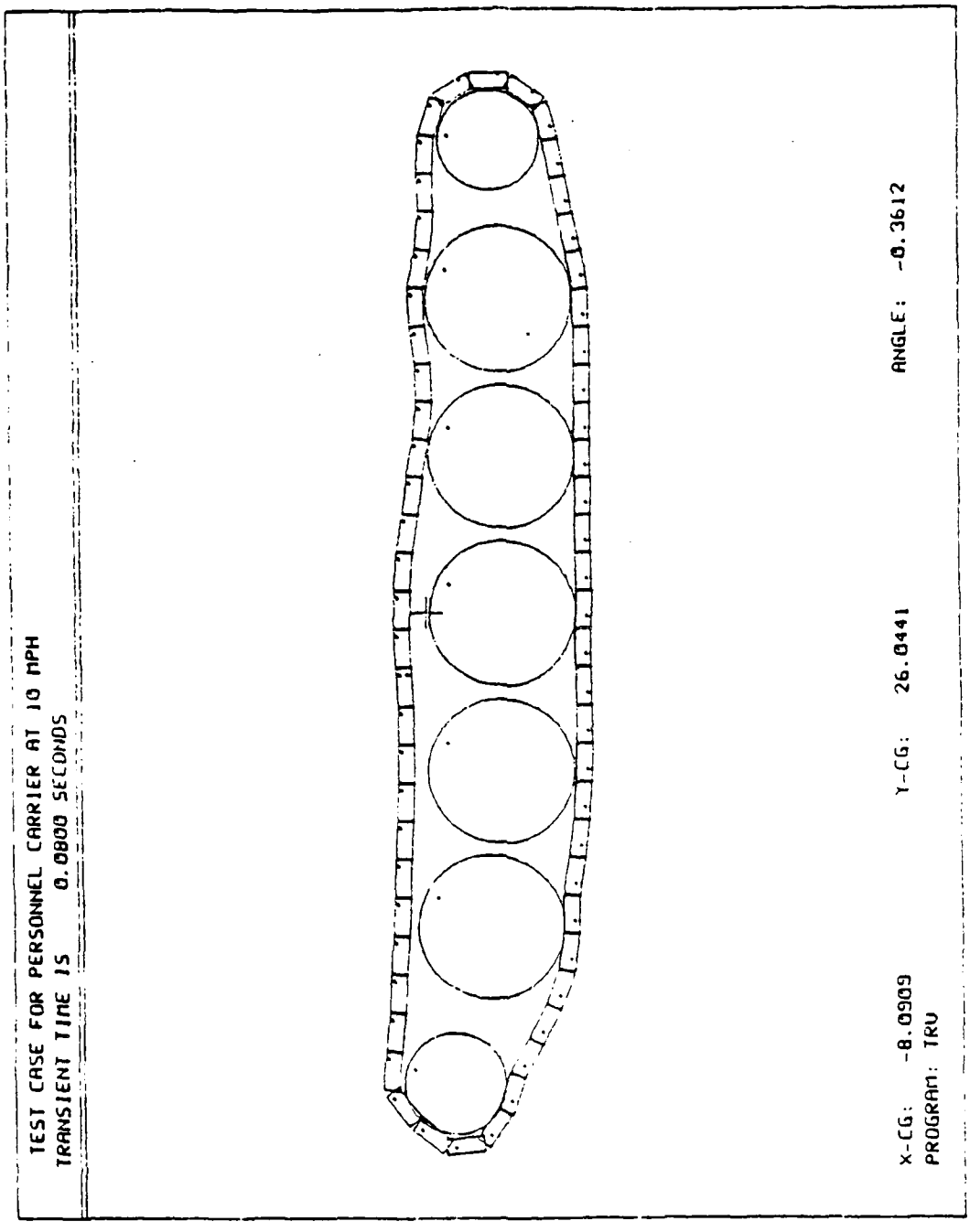


Figure 5-21. Test Case for a Personnel Carrier at 10 MPH, Time = 0.08 Seconds

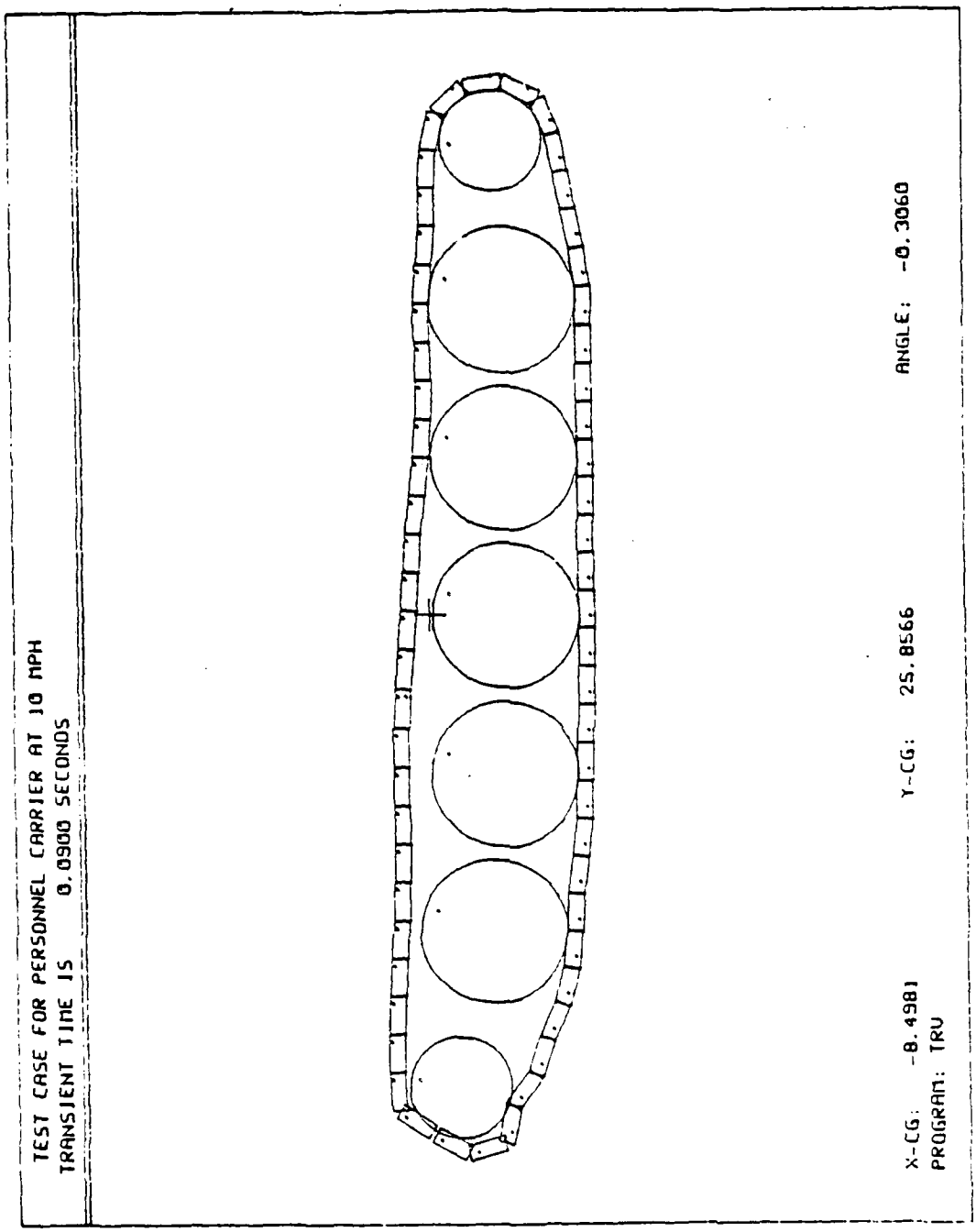


Figure 5-22. Test Case for a Personnel Carrier at 10 MPH, Time = 0.09 Seconds

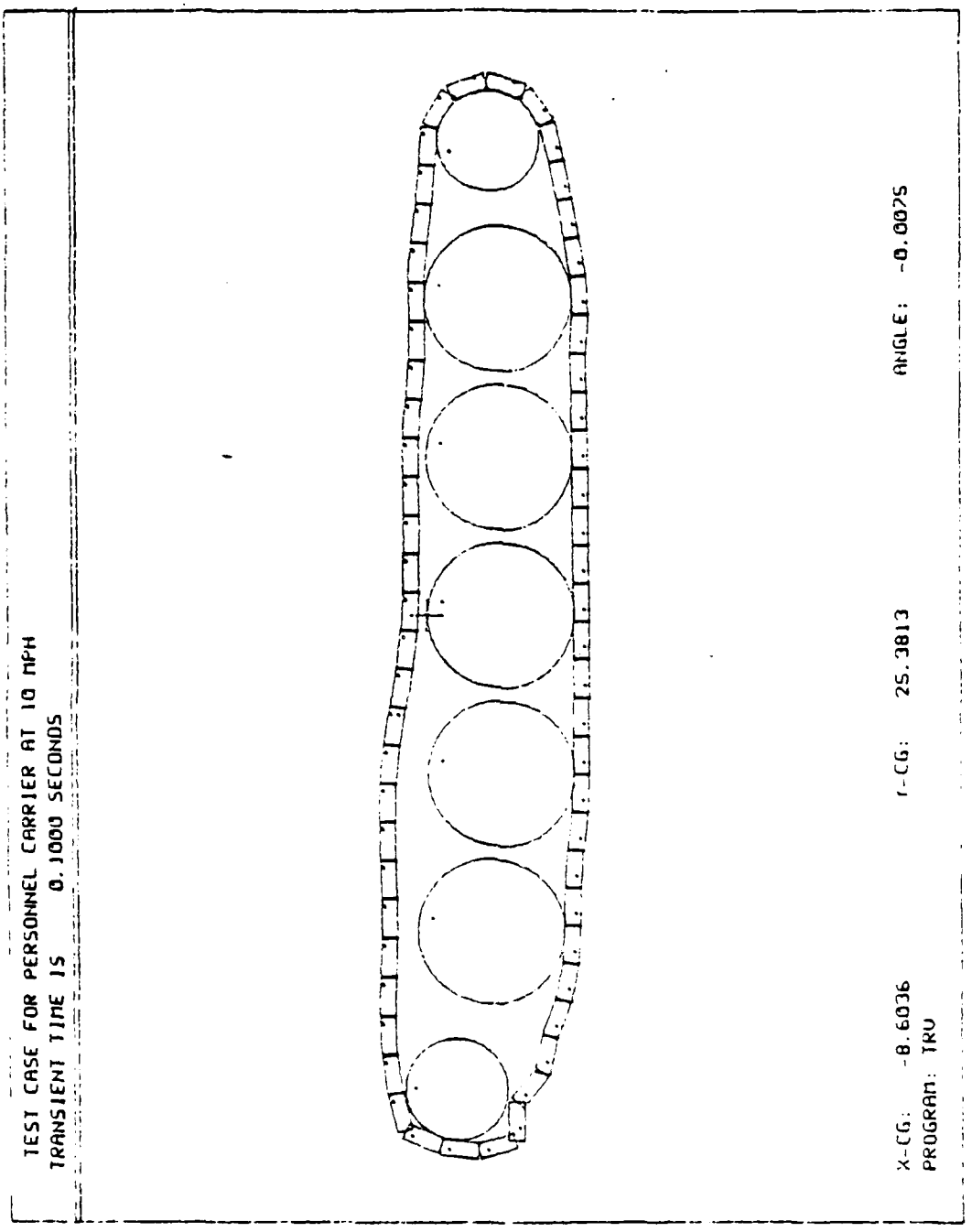


Figure 5-23. Test Case for a Personnel Carrier at 10 MPH, Time = 0.10 Seconds

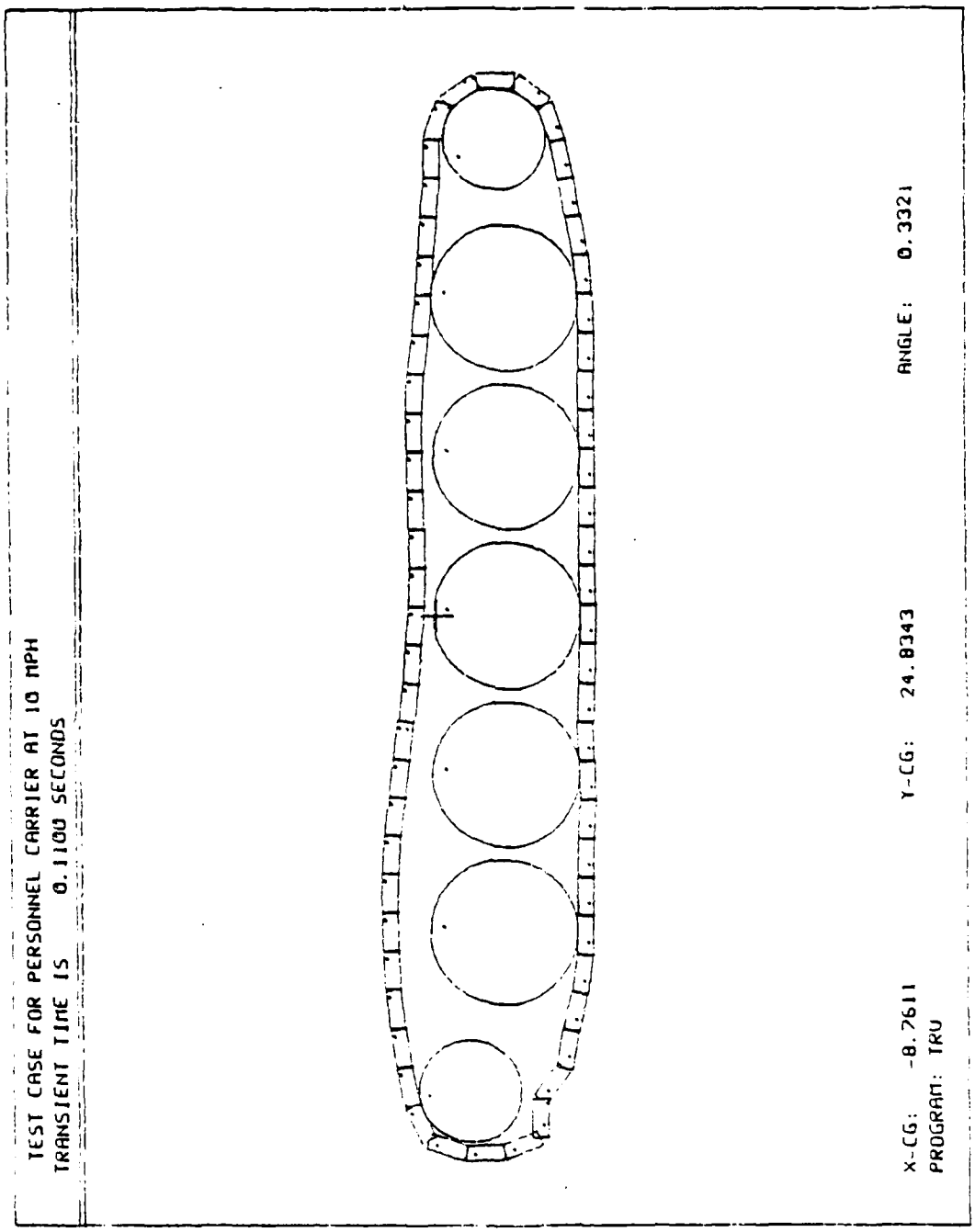


Figure 5-24. Test Case for a Personnel Carrier at 10 MPH, Time = 0.11 Seconds

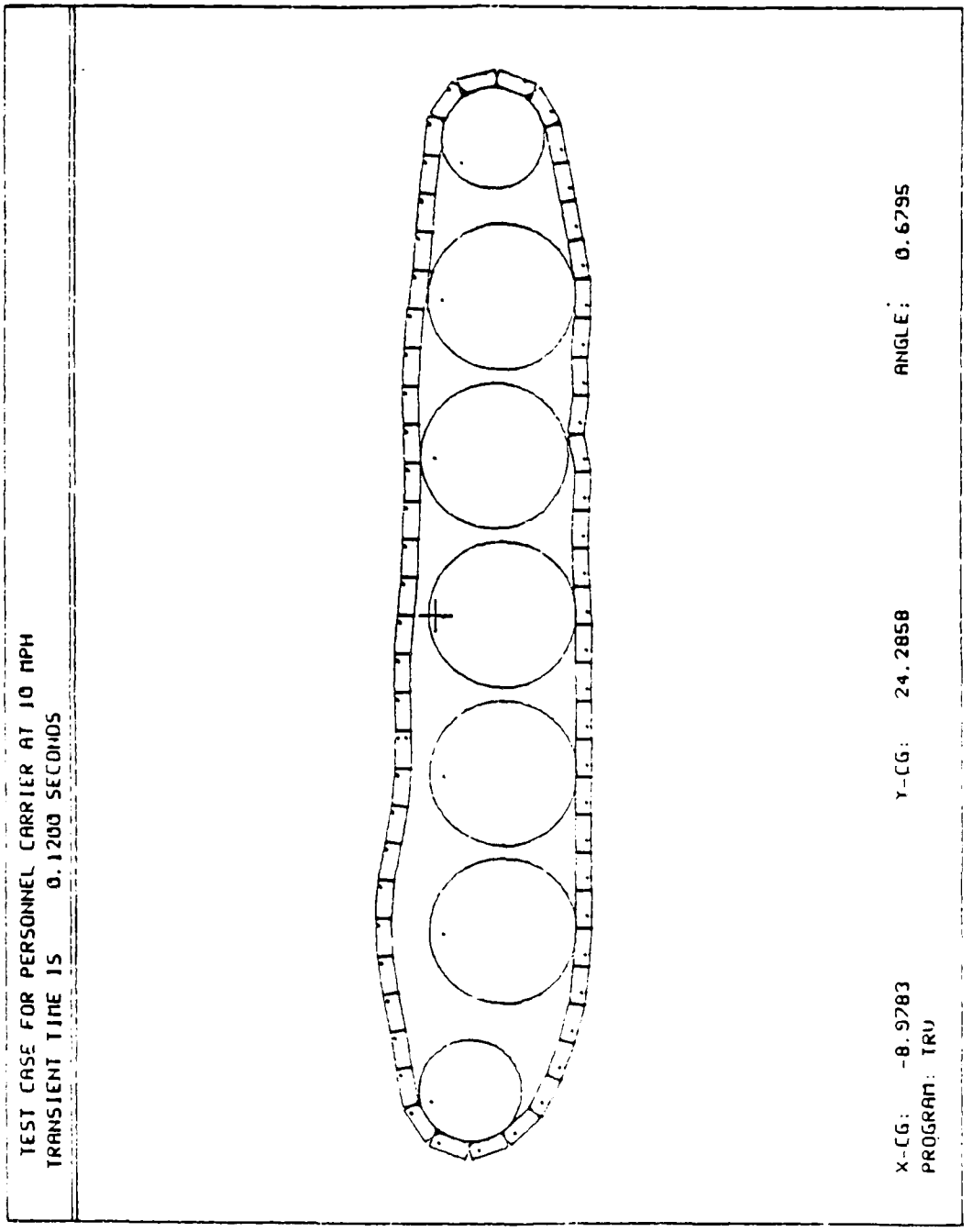


Figure 5-25. Test Case for a Personnel Carrier at 10 MPH, Time = 0.12 Seconds

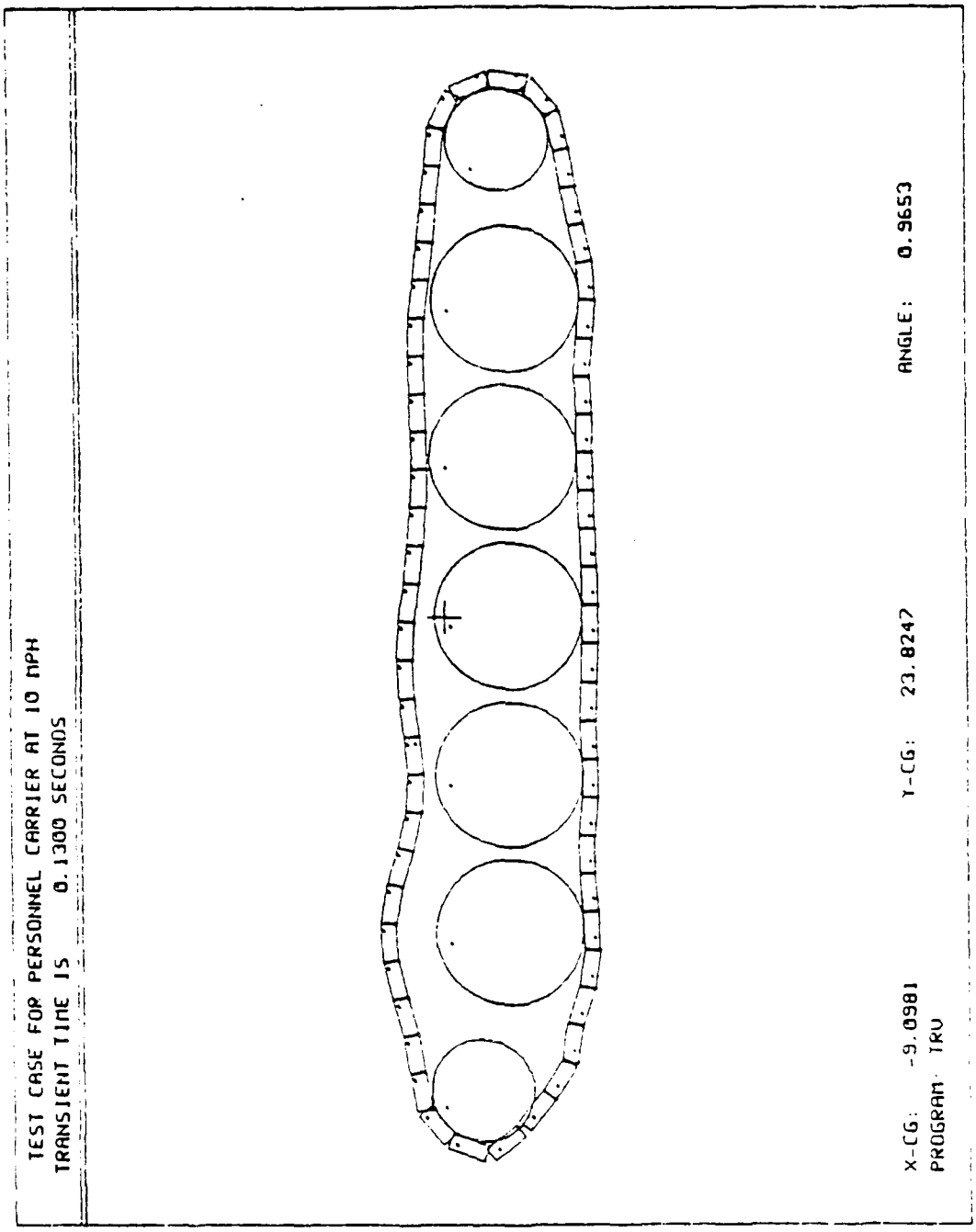


Figure 5-26. Test Case for a Personnel Carrier at 10 MPH, Time = 0.13 Seconds

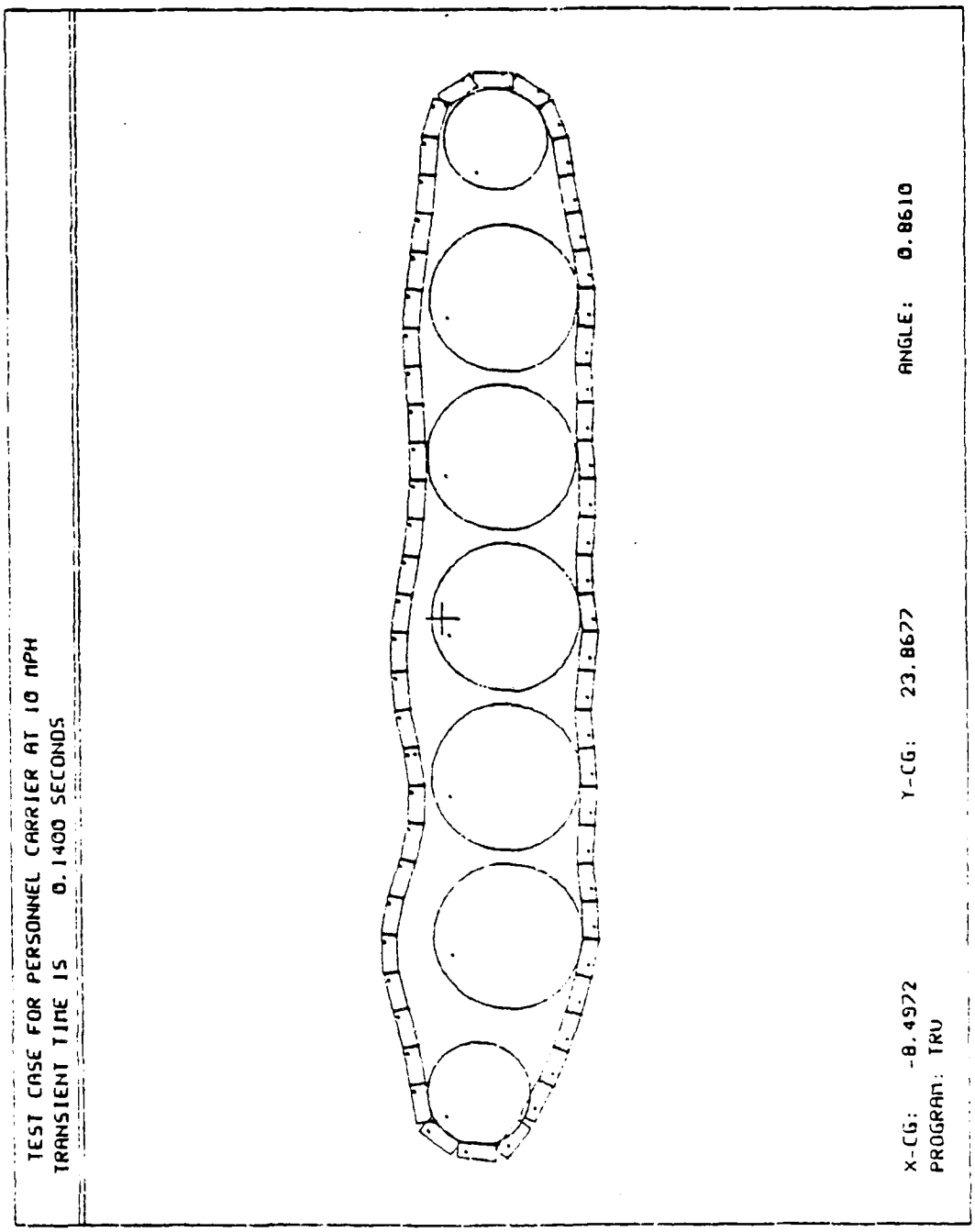


Figure 5-27. Test Case for a Personnel Carrier at 10 MPH, Time = 0.14 Seconds

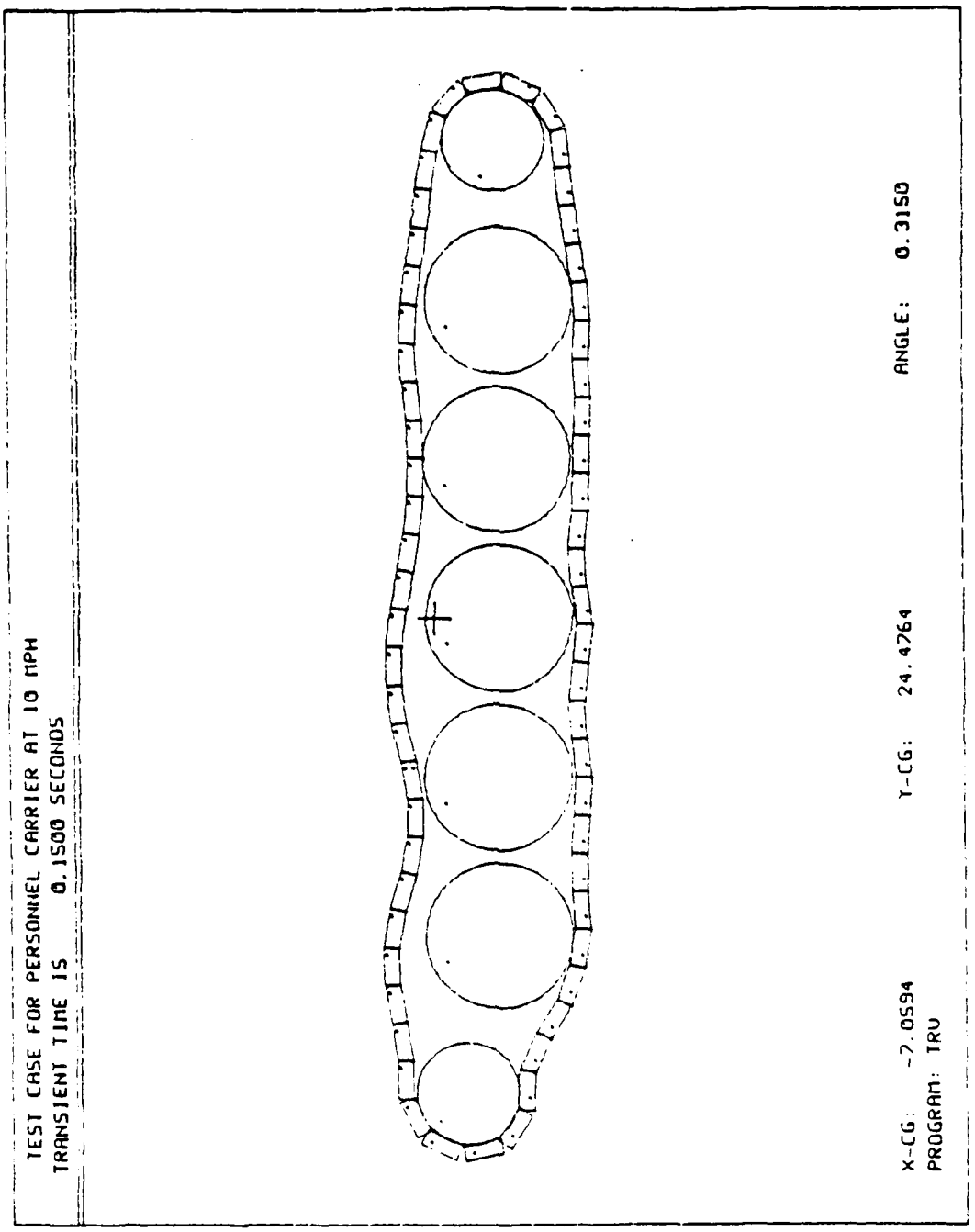


Figure 5-28. Test Case for a Personnel Carrier at 10 MPH, Time = 0.15 Seconds

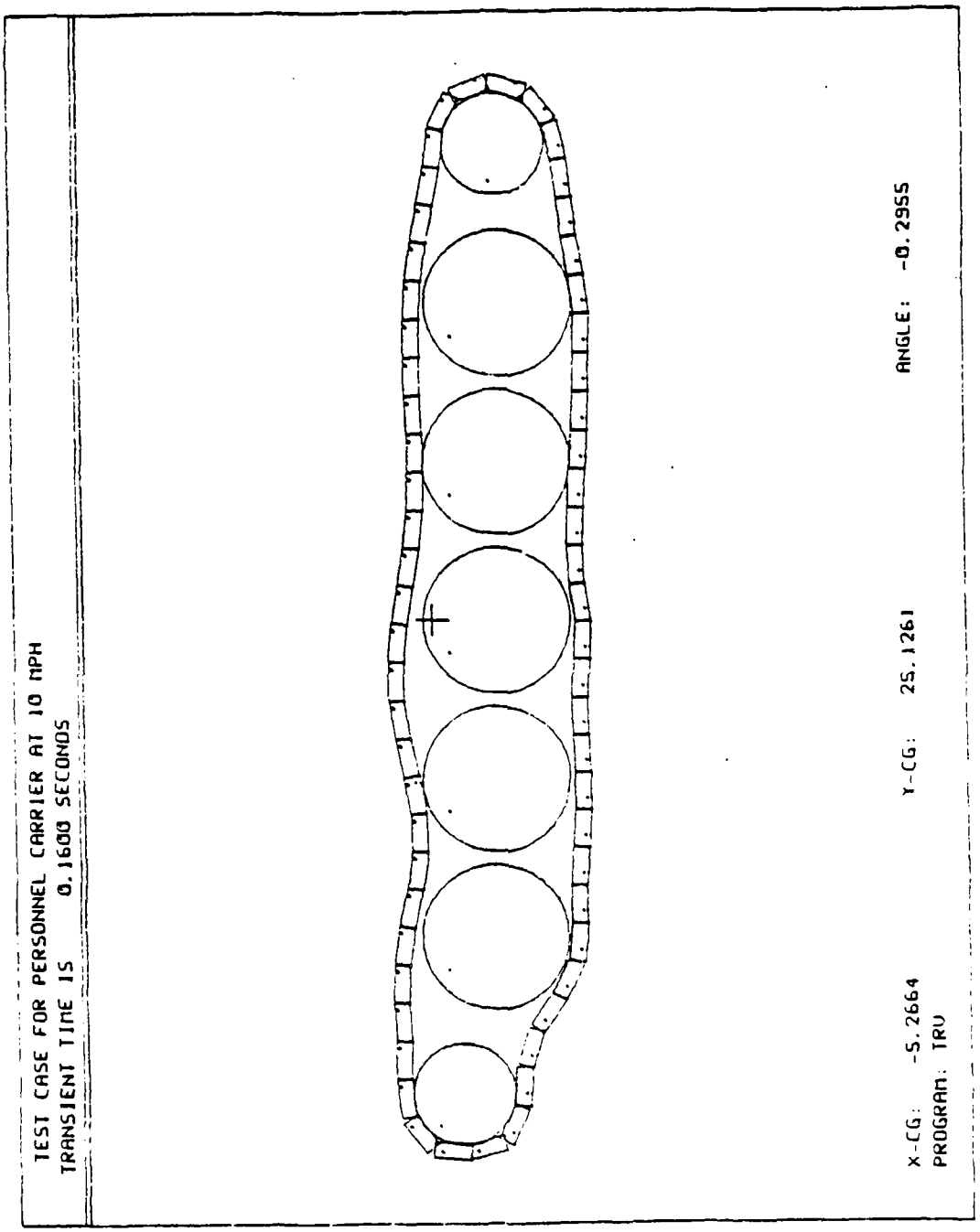


Figure 5-29. Test Case for a Personnel Carrier at 10 MPH, Time = 0.16 Seconds

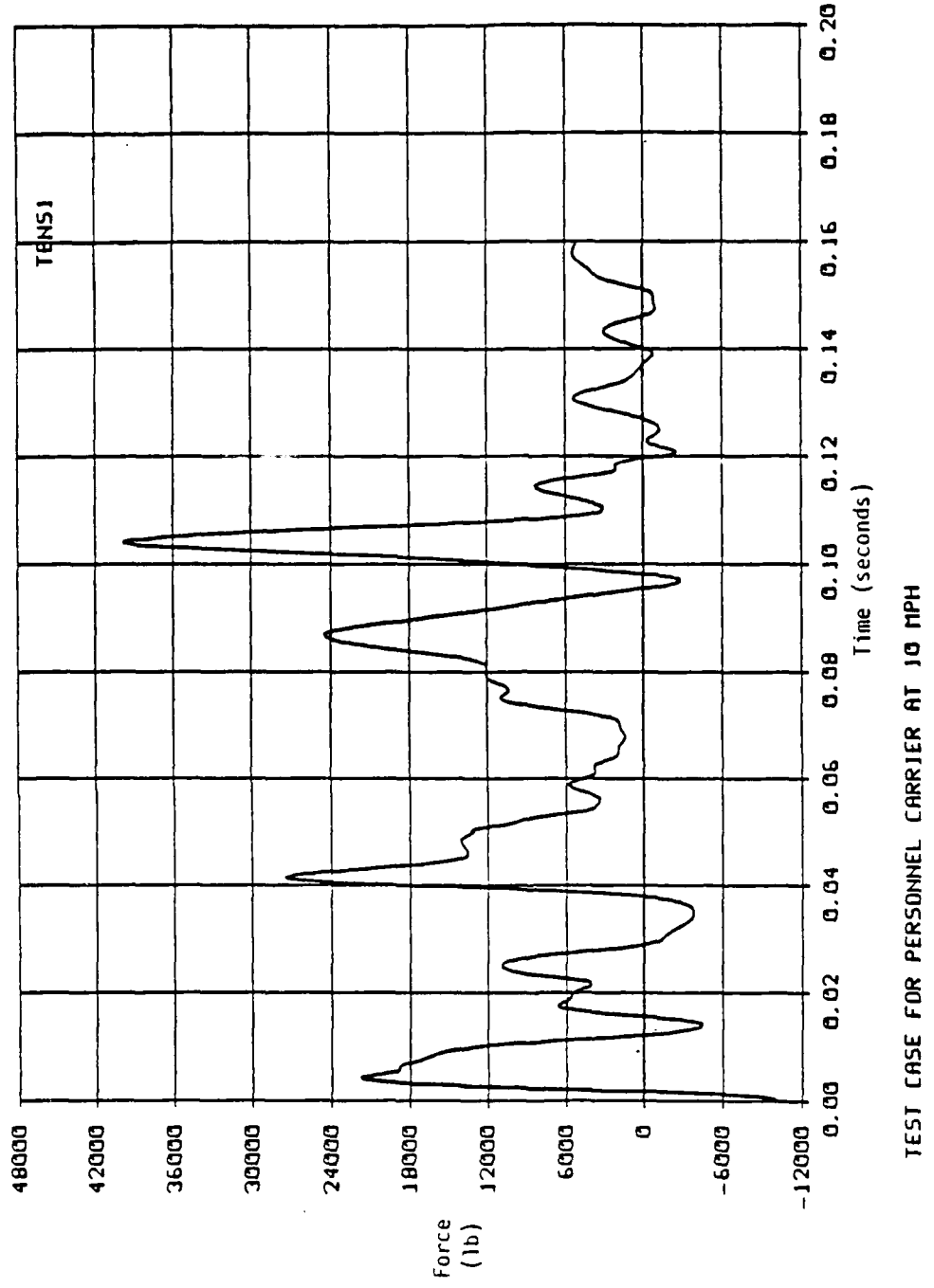


Figure 5-30. Track Tension as a Function of Time, Track Monitor Shoe 1, Test Case for a Personnel Carrier at 10 MPH

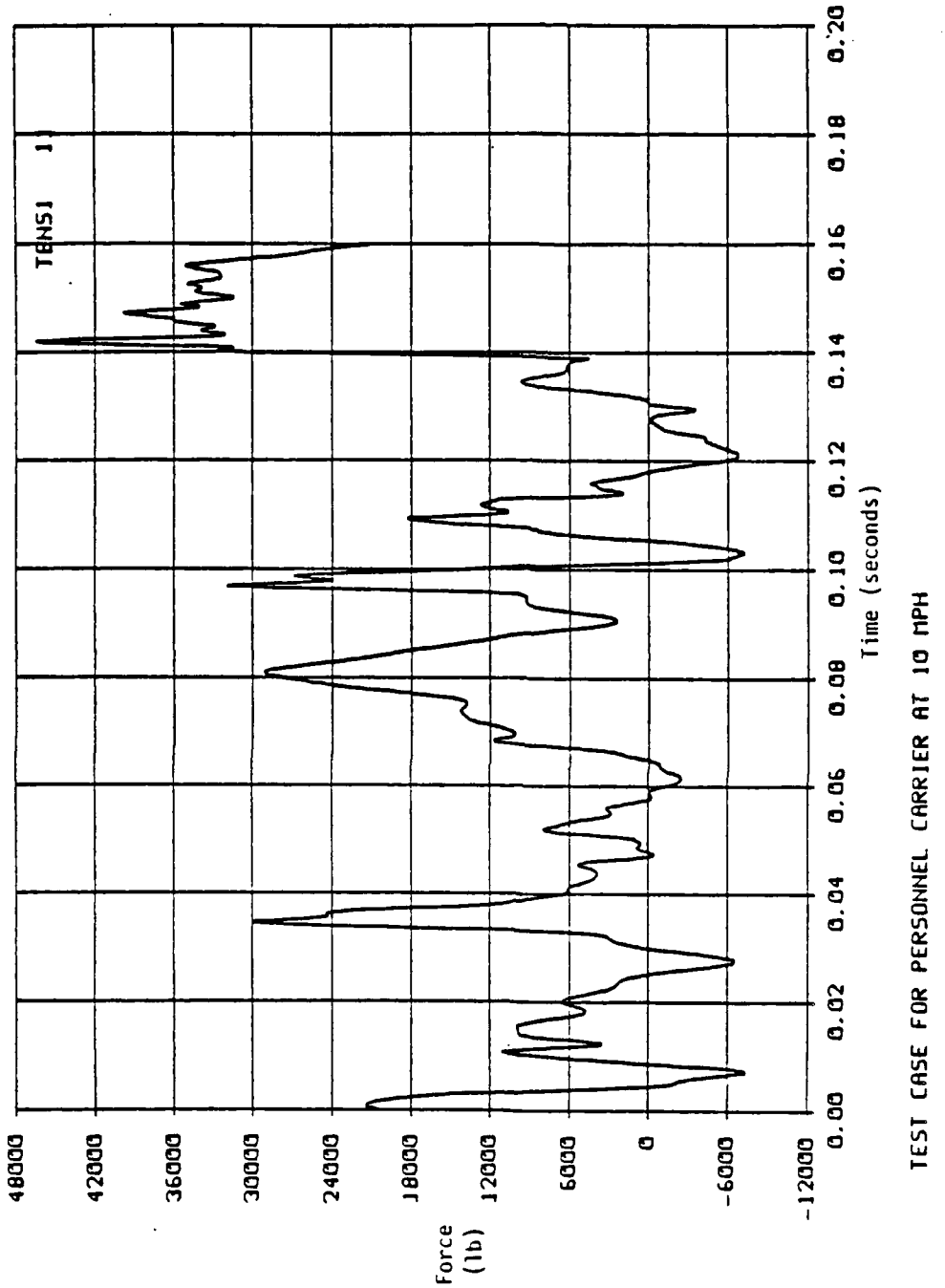


Figure 5-31. Track Tension as a Function of Time, Track Monitor Shoe 11, Test Case for a Personnel Carrier at 10 MPH

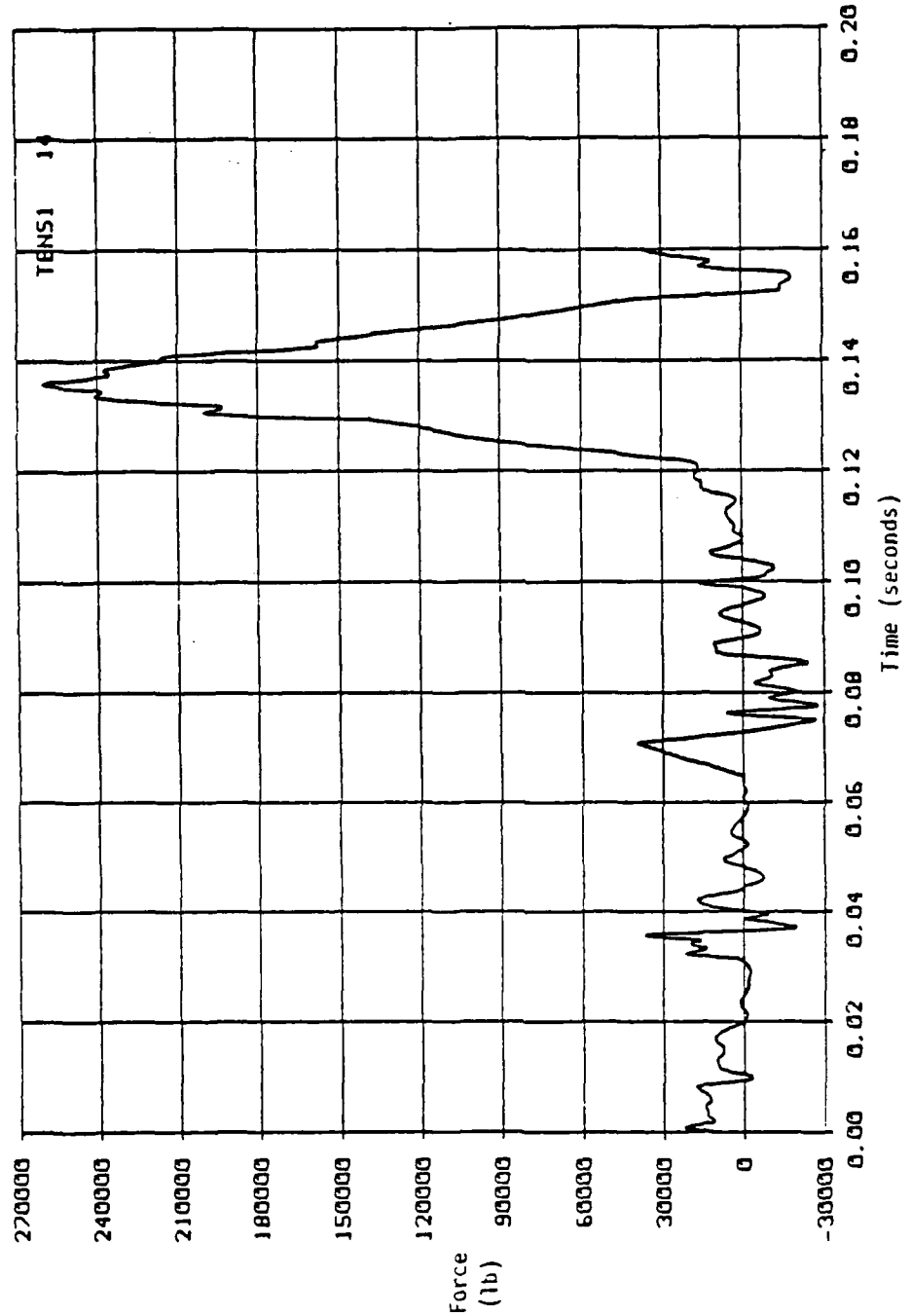


Figure 5-32. Track Tension as a Function of Time, Track Monitor Shoe 14, Test Case for a Personnel Carrier at 10 MPH

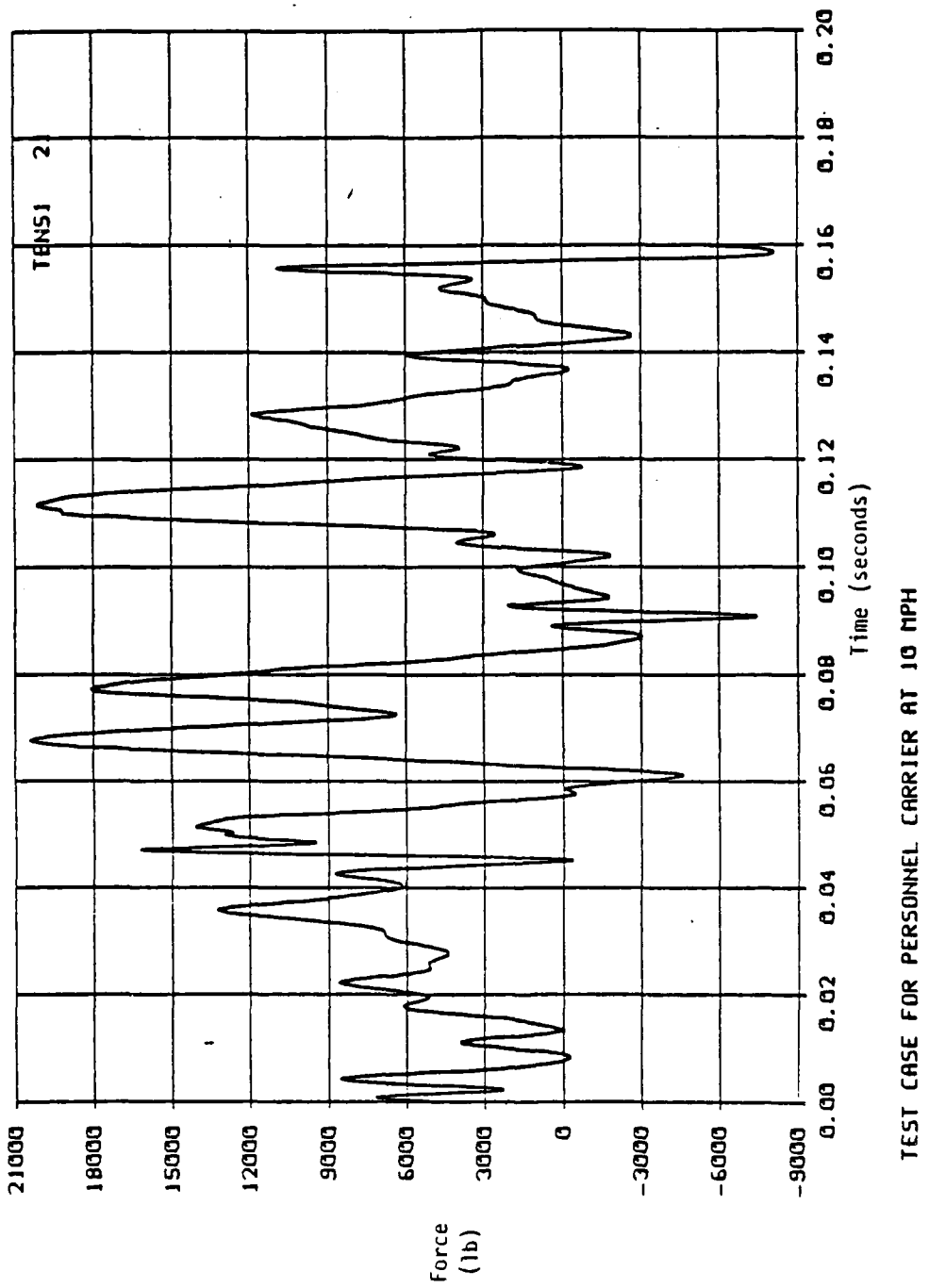


Figure 5-33. Track Tension as a Function of Time, Track Monitor Shoe 21, Test Case for a Personnel Carrier at 10 MPH

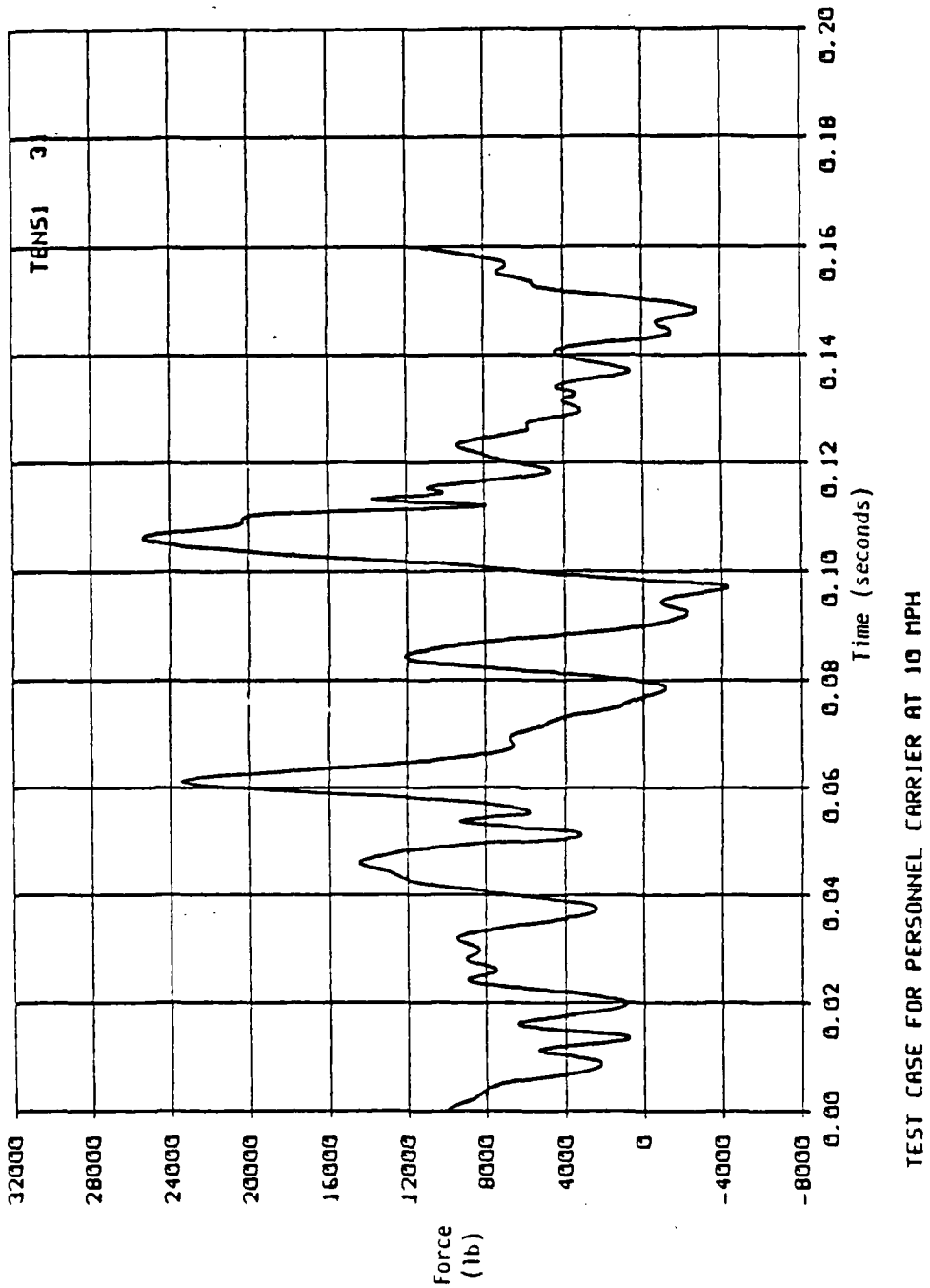


Figure 5-34. Track Tension as a Function of Time, Track Monitor Shoe 31, Test Case for a Personnel Carrier at 10 MPH

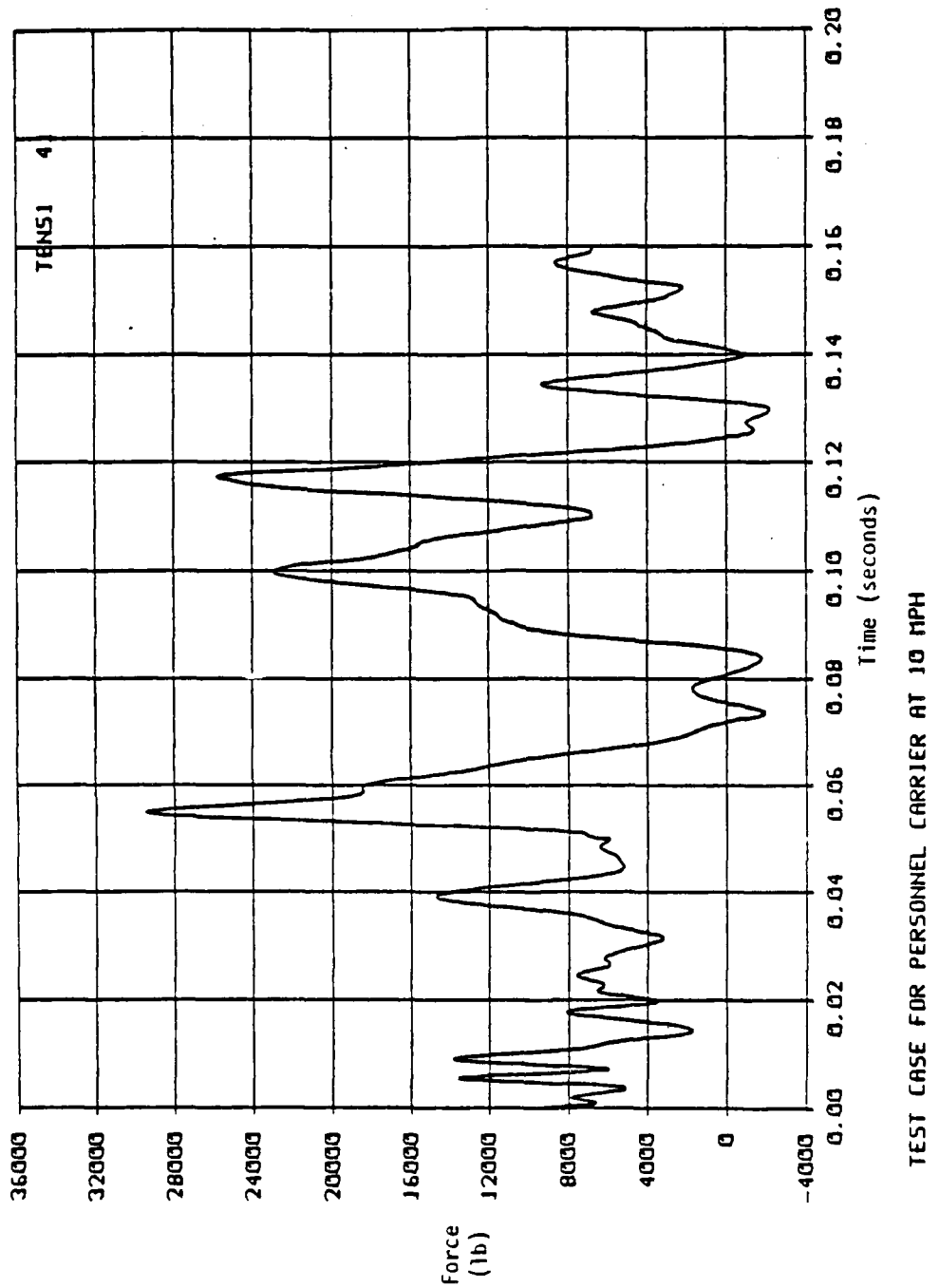


Figure 5-35. Track Tension as a Function of Time, Track Monitor Shoe 41, Test Case for a Personnel Carrier at 10 MPH

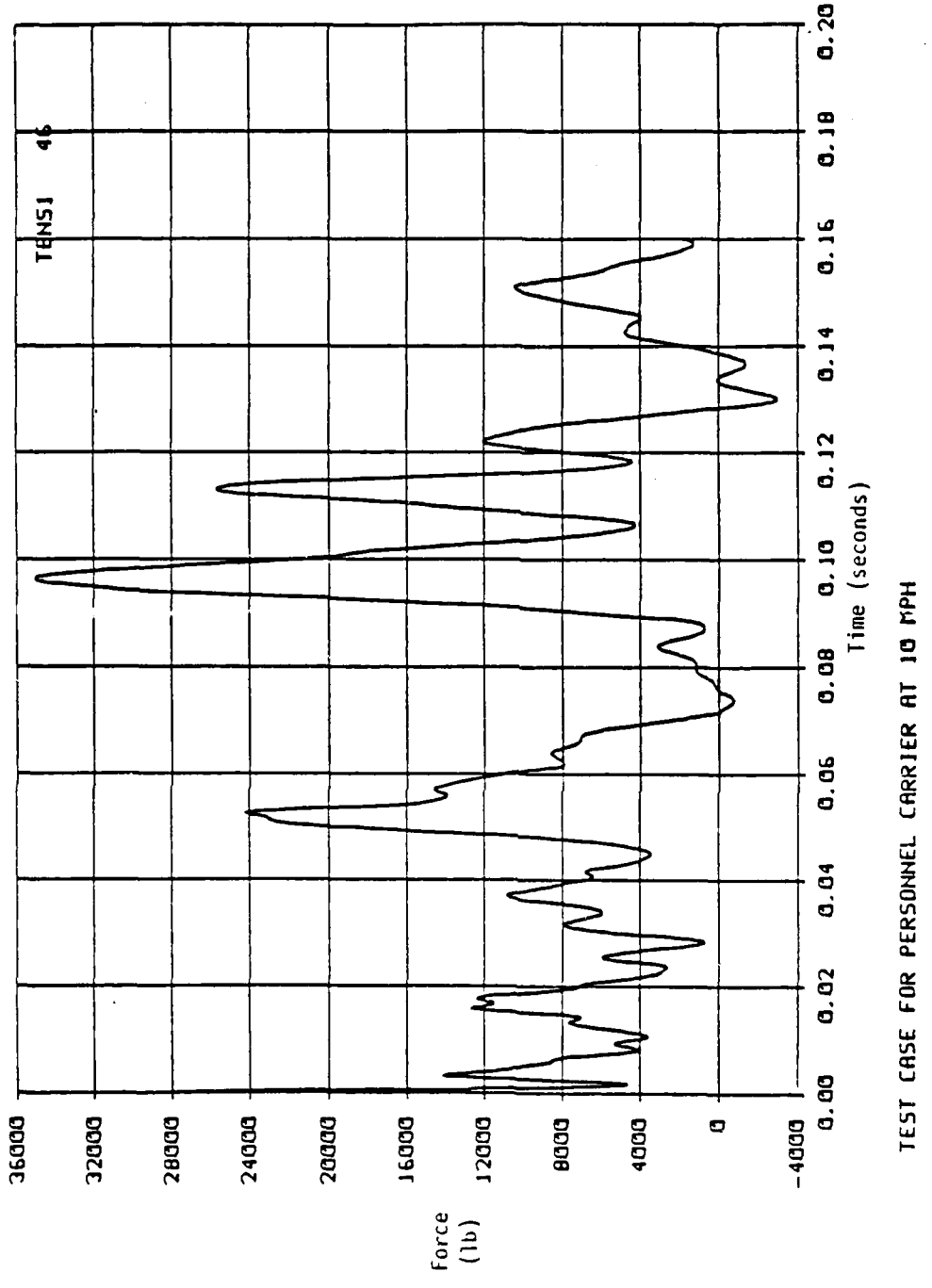


Figure 5-36. Track Tension as a Function of Time, Track Monitor Shoe 46, Test Case for a Personnel Carrier at 10 MPH

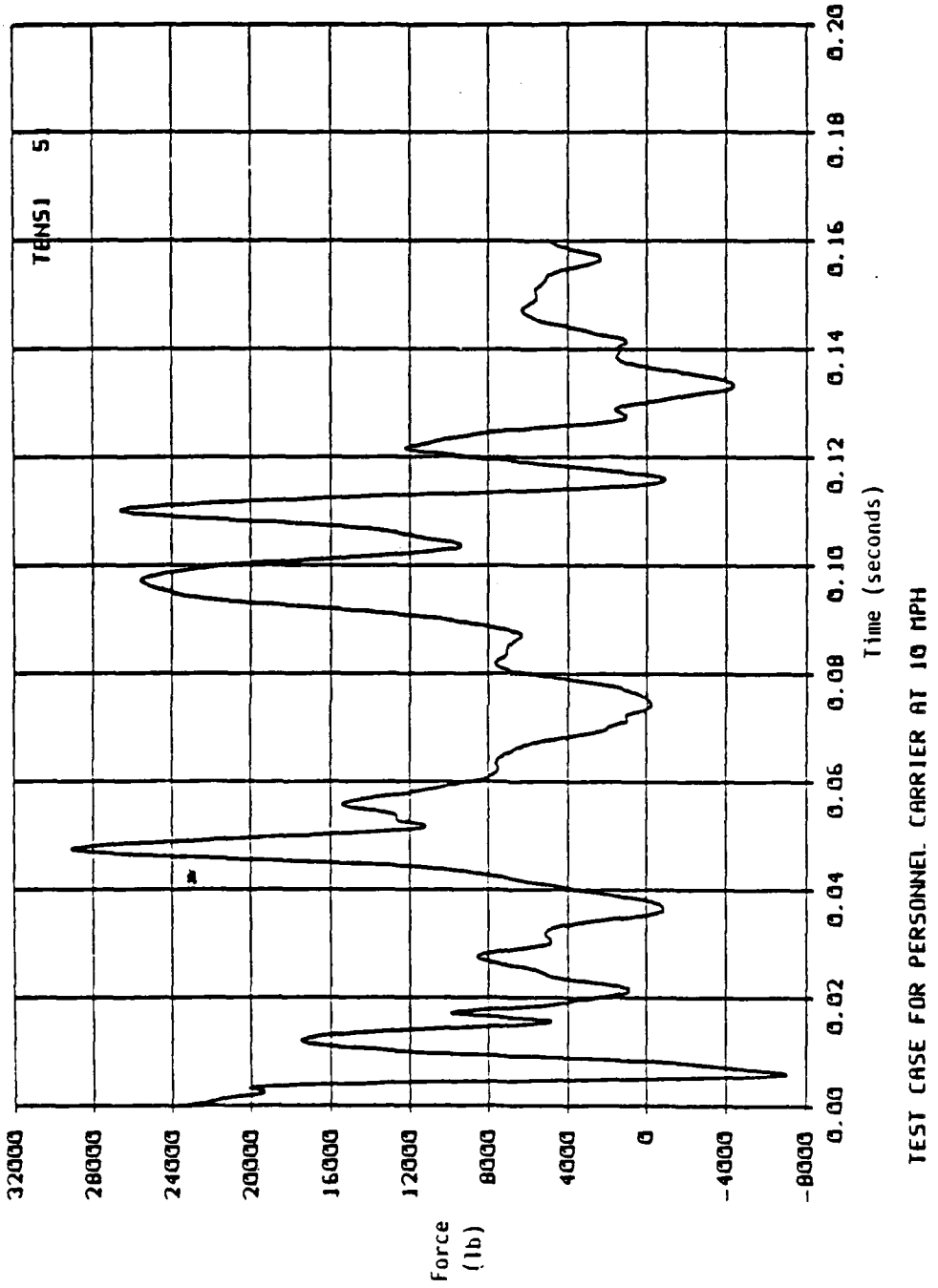


Figure 5-37. Track Tension as a Function of Time, Track Monitor Shoe 51, Test Case for a Personnel Carrier at 10 MPH

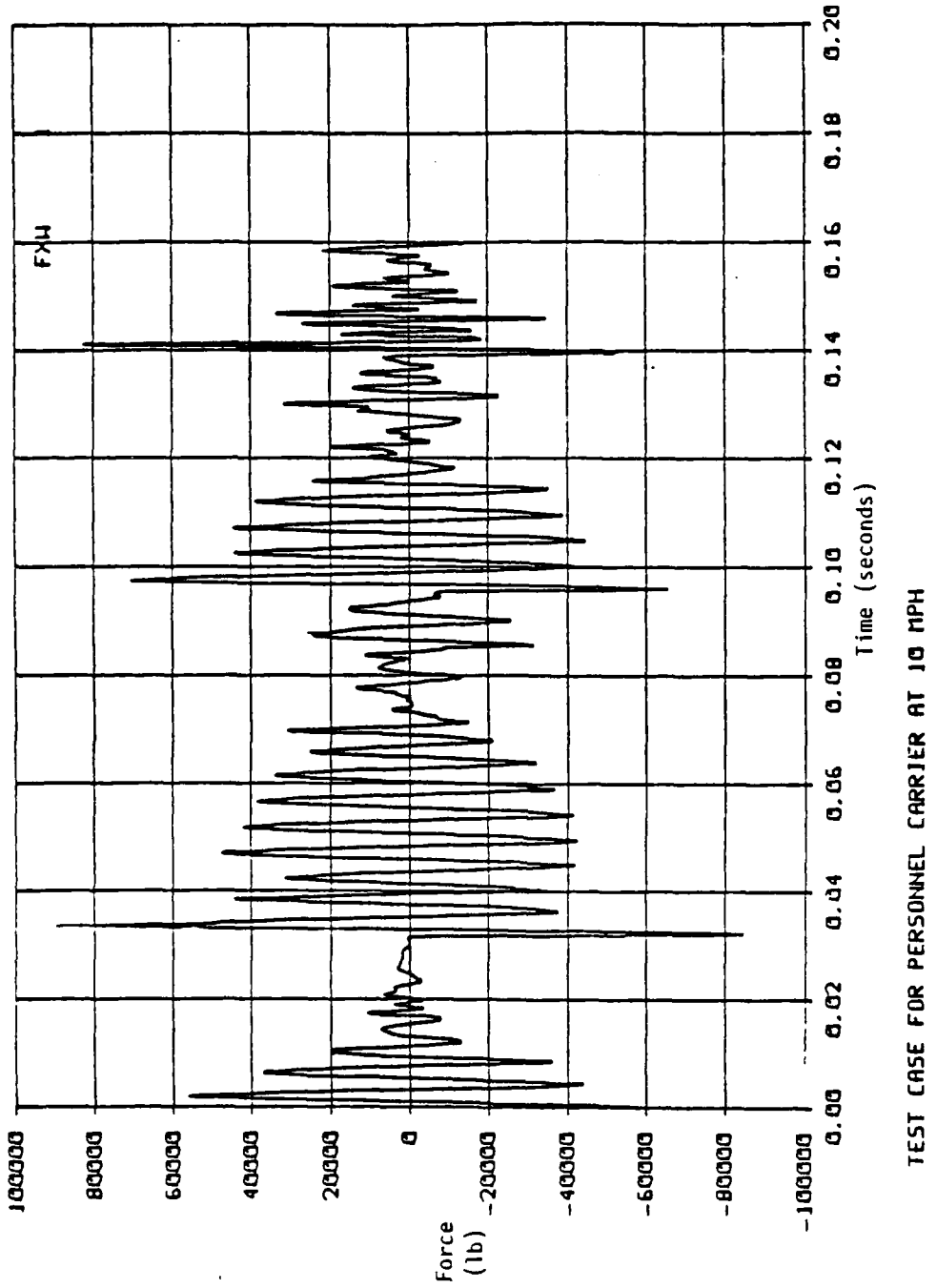


Figure 5-38. Net Horizontal Force on the Drive Sprocket as a Function of Time, Test Case for Personnel Carrier at 10 MPH

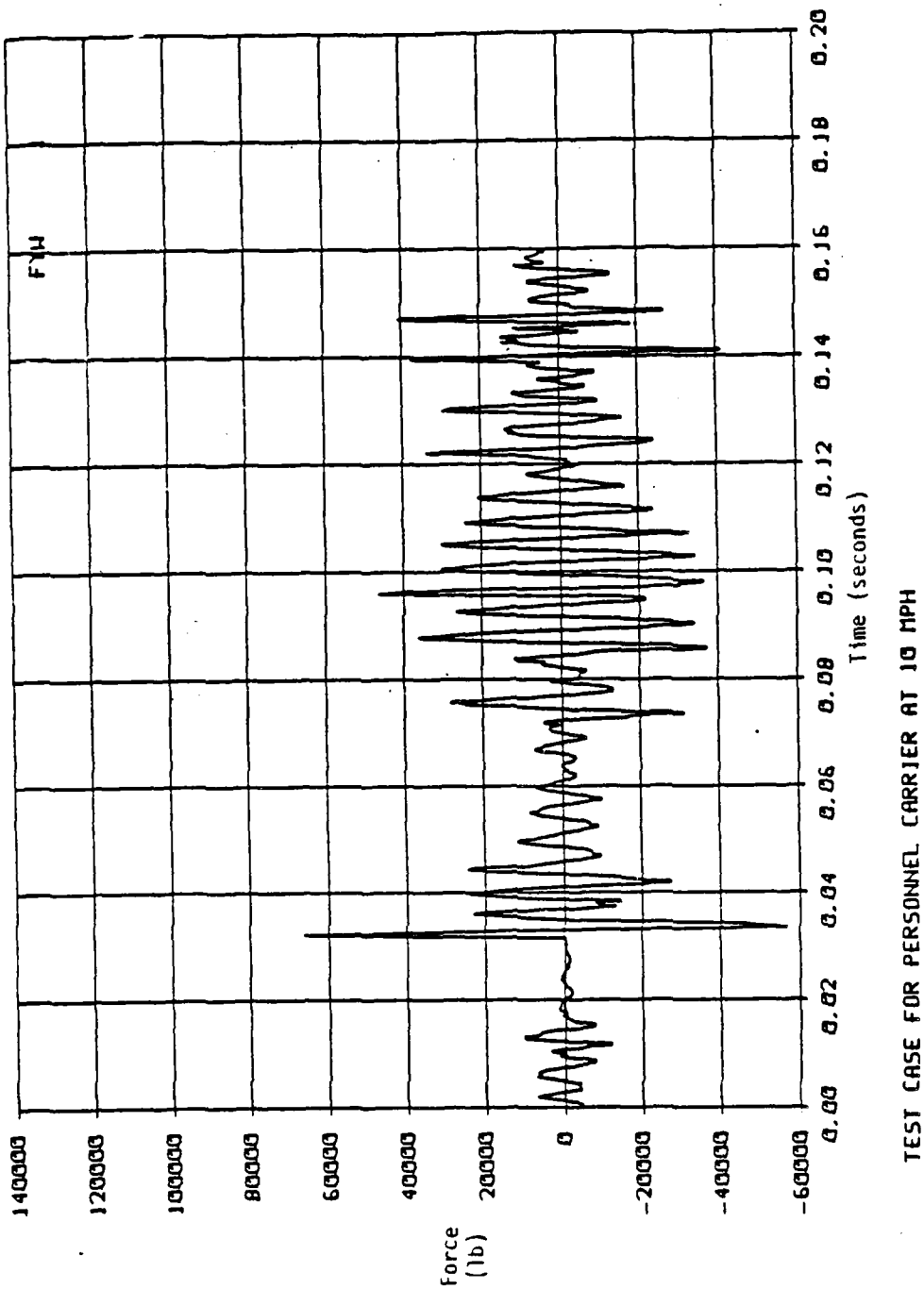


Figure 5-39. Net Vertical Force on the Drive Sprocket as a Function of Time, Test Case for Personnel Carrier at 10 MPH

oscillations is dependent on the stiffness of the sprocket with respect to the vehicle, which has not been measured but was estimated as part of the program input.

Figures 5-40 and 5-41 show the net forces at the third road wheel in the horizontal and vertical directions, respectively. The effect of a track impact can also be seen in these figures.

Figures 5-42 and 5-43 show the shear forces at two track/pin interfaces. These forces illustrate a "beat" phenomenon associated with the impact of tracks at the drive sprocket. The higher frequency component of the "beat" is caused by the response of the drive sprocket while the enveloping "beat" is caused by the response of the track.

Due to the uncertainty associated with the dynamic material properties used in modeling the suspension components and the track, it became apparent that while the analytical approach is feasible, the exact results of this model may not be accurate and cannot be validated without additional test data. Therefore, additional constant speed evaluations were not completed, as the results of these calculations would contain consistent errors related to dynamic material property uncertainties.

We can conclude from these feasibility calculations, however, that the analytical technique is viable. Additional work is required in Phase II to test components for dynamic material properties, to refine and validate the computer model using these test results, and to evaluate alternate materials or mechanical components which will provide a more rugged and durable track than the existing track.

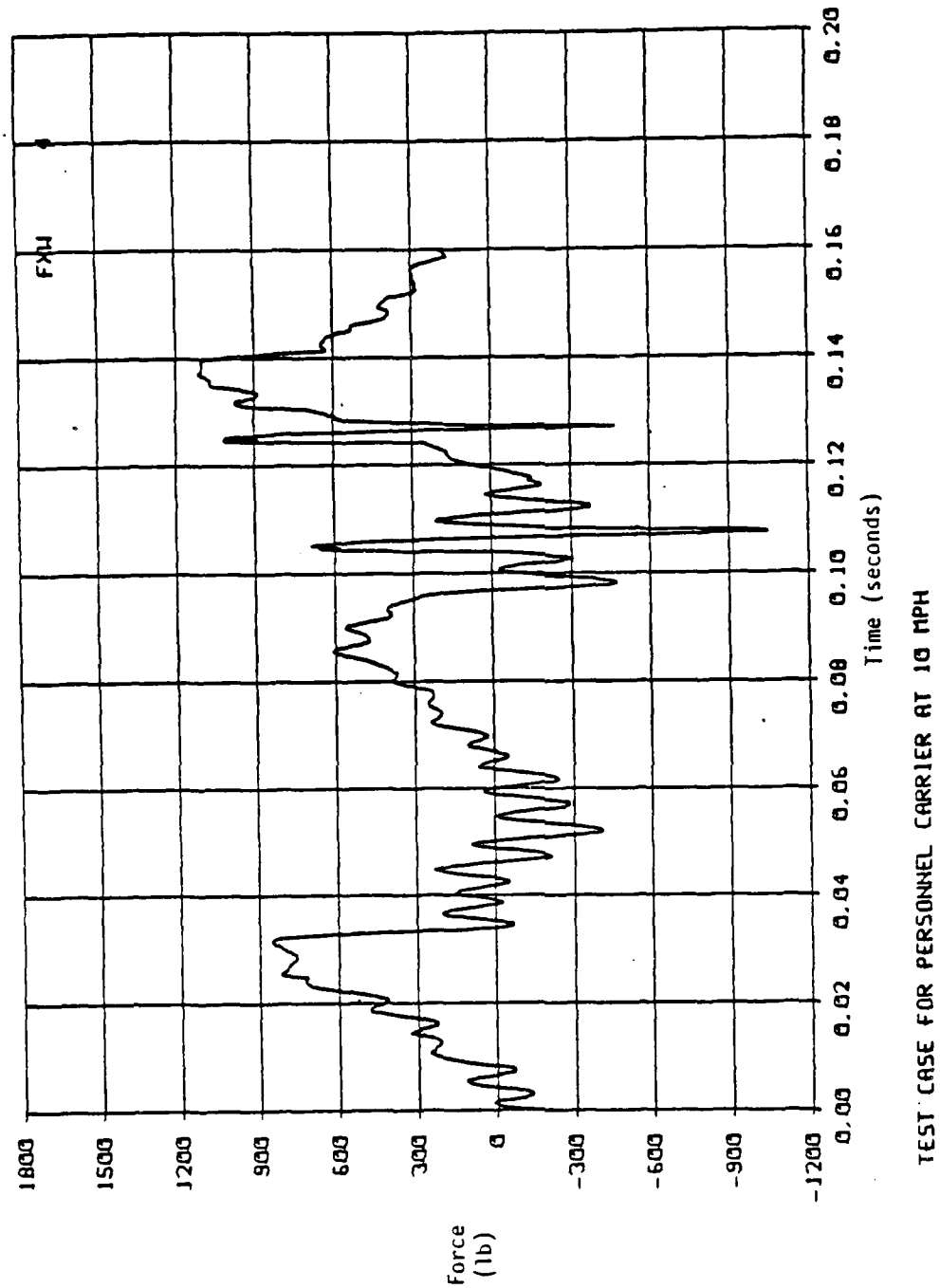


Figure 5-40. Net Horizontal Force at the Third Road Wheel as a Function of Time, Test Case for Personnel Carrier at 10 MPH

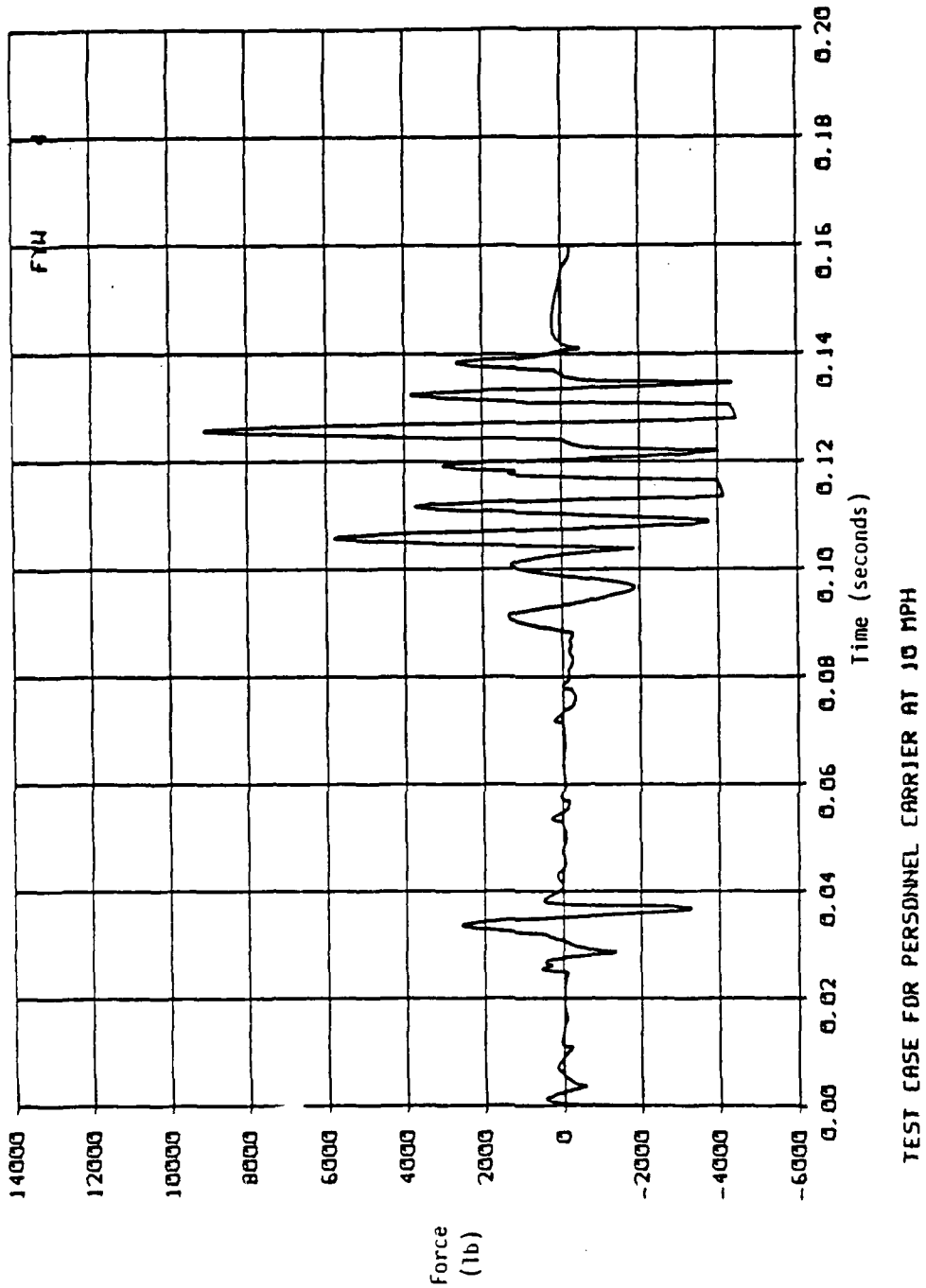


Figure 5-41. Net Vertical Force at the Third Road Wheel as a Function of Time, Test Case for Personnel Carrier at 10 MPH

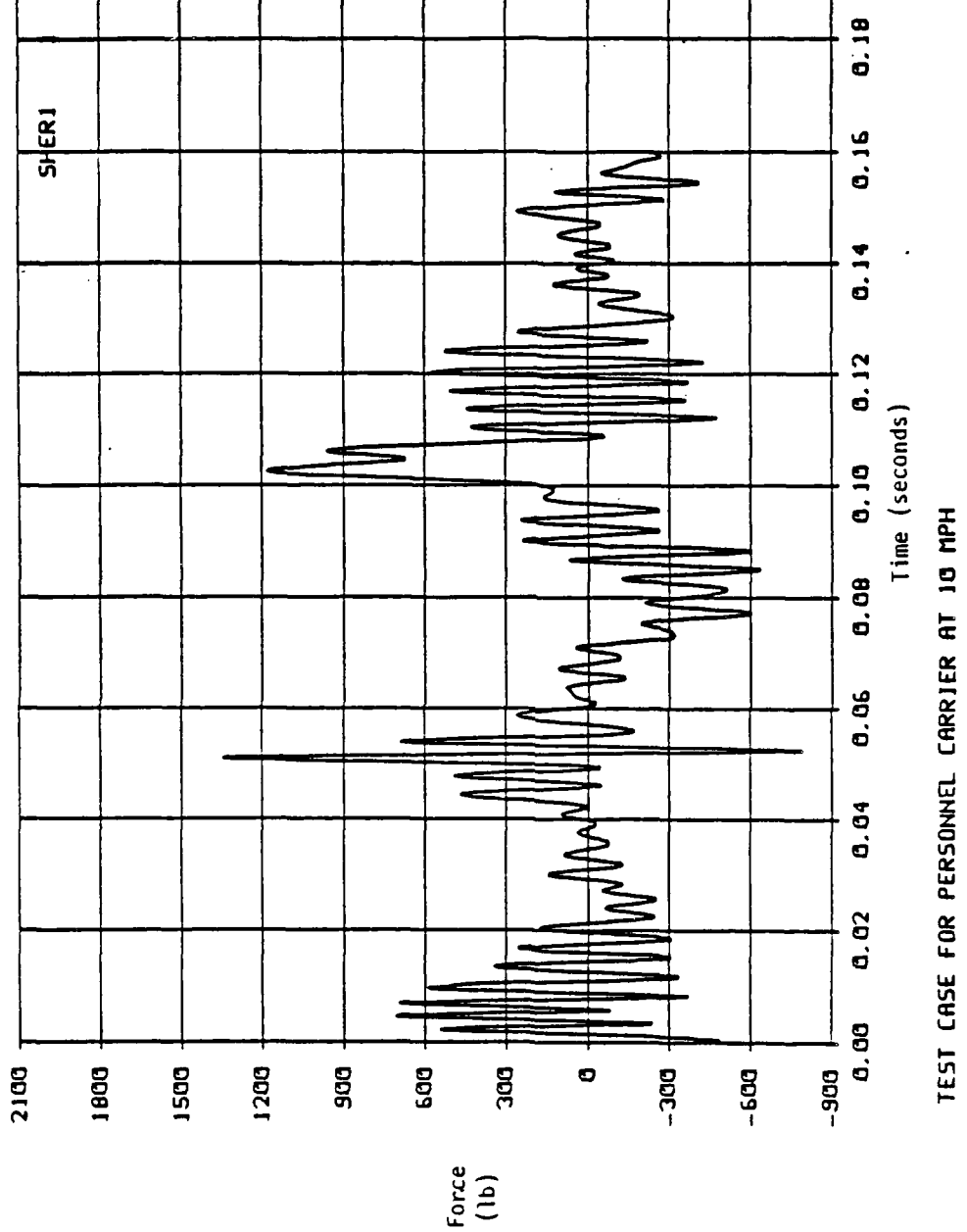


Figure 5-42. Shear Force at Track Pin Interface as a Function of Time, Monitor Track Shoe 1, Front Pin, Test Case for a Personnel Carrier at 10 MPH

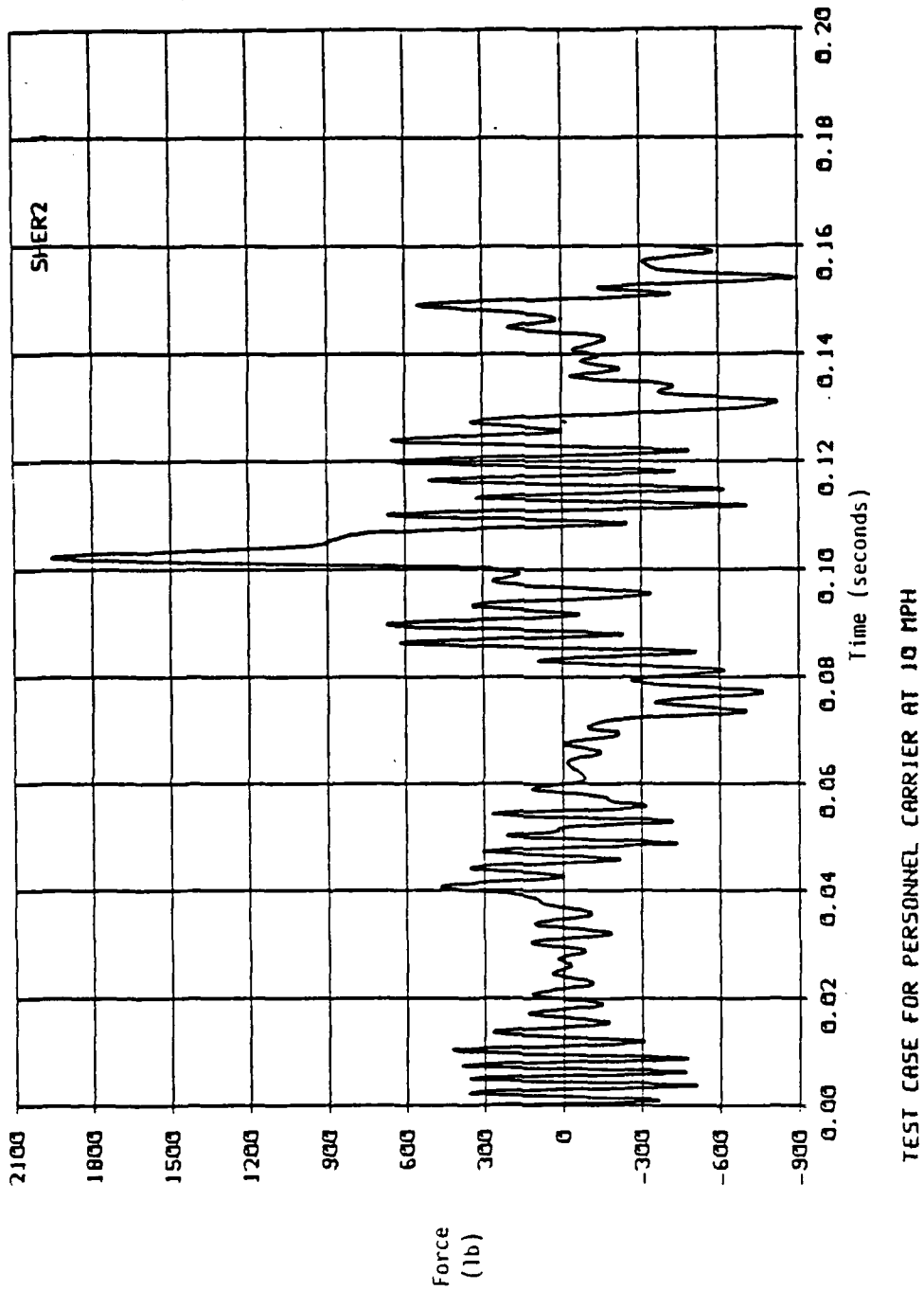


Figure 5-43. Shear Force at Track Pin Interface as a Function of Time, Monitor Track Shoe 1, Rear Pin, Test Case for a Personnel Carrier at 10 MPH

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APPENDIX A

DESCRIPTION OF CURRENT TRACK DESIGN PRACTICE

A.1. Track Design Practice

A summary of the current track design practice is as follows:

Reversible Block and Pin Track - The reversible block and pin track type consists of a chain formed by a series of rigid links (shoes) connected by hinged joints. The hinged joints are formed by passing a pin through interlocking links (single pin shoe) or through adjacent rigid links (double pin shoe). (Note : For the single pin shoe, the block is referred to as the body.) Track blocks can be constructed of steel casings with a rubber pad or of an all rubber construction. (Note: All rubber blocks are not currently in use on U.S. military vehicles.) Pins are high strength carbon steel. At the pin joint, the interfaces may be either dry steel on steel, lubricated steel on steel, rubber bushings or lubricated bearings. These tracks are free to rotate about the pin joint in either direction and can be used with a sprung suspension, such as a torsion bar suspension. The advantage of this track type is that, with a sprung suspension, this track can traverse uneven terrain by conforming to the shape of the terrain. One disadvantage of this track type is a large track to vehicle weight ratio (regardless of whether the block is of a steel/rubber or a rubber construction). Also, the steel pins are subject to fatigue failure[14]. Additional disadvantages of this track type are discussed in the descriptions of the pin/track interface designs. Recently, research has been conducted on substituting aluminum for steel in the construction of the track block[9]. Although the initial tests show promise, the wear characteristics of aluminum sprockets and track blocks limit the life of these tracks. In addition, the reduced mass of the track may affect track vibration response and amplitude. This is discussed further in Section 3.2 of the report.

Irreversible Block and Pin Track - This type of track is similar to the reversible block and pin track but is connected to only allow block rotation around the pin when the track is passing over the drive sprocket or follower sprocket. The ground pressure under the irreversible block and pin track is more uniform than under the reversible block and pin track, because the track acts more like a beam on an elastic foundation. Advantages of this type of track are reduced motion resistance due to soil compaction. Disadvantages are the inability to use a sprung suspension system or to easily traverse uneven terrain.

Band Track - The band track type is a continuous band which is flexible along its length. This differs from the block and pin track which is only flexible at the pin connections. The track is constructed of steel track bars reinforced longitudinally by steel wire rope cables. Track alignment guides are welded to the wheel side of steel track bars and rubber pads are bonded to the ground side of the bars. The application of this track is limited b strength, wear and fatigue considerations of the materials of

construction, particularly the wire rope. Vehicle weights for this track type have typically been less than 10 tons. The chief advantage of this track is a lower ratio of track weight to vehicle weight. Disadvantages are difficult maintenance and strength limitations.

Spaced Link Track - The spaced link track is similar to the block and pin tracks described above but is adapted to specific "soft" terrain conditions (e.g. deep snow) by spacing track grouses to optimize subsurface soil shear area to minimize slipping of the tracks and dissipation of tractive energy. A disadvantage of the spaced link track is that the grouses have to be designed to also withstand high impact loadings for high speed operation on hard surfaces. This track design continues to be experimental.

Pin/Track Interface Design Practice

There are four pin/track interface designs used at the pin joint of the block and pin track. These are dry steel on steel, lubricated steel on steel, rubber bushings and lubricated bearings. The advantages and disadvantages of each design are summarized as follows:

Dry Steel on Steel - Dry steel on steel pin/track interfaces are used extensively in track design outside of the U.S. The advantages of this design are low motion resistance and a simple design with few parts. Disadvantages are excessive wear, a short useful life and excessive vibration and power losses at resonant velocities.

Lubricated Steel on Steel - Lubricated steel on steel pin/track interfaces are essentially the same as the dry steel on steel interfaces with the addition of a lubricating film between the pin and the track. The lubricated pin typically has flexible seals at the ends of the pins to prevent foreign matter from entering the joint and to keep the lubricant between the pin and the shoe. The advantages of the lubrication are reduced pin and track wear compared to the dry steel on steel interfaces. Disadvantages are short seal lives and excessive vibration and power losses at resonant velocities.

Rubber Bushings - The rubber bushed pin/track interfaces are similar to the dry steel on steel except that the pin is surrounded by a rubber bushing. The rubber bushing is preloaded in compression when it is installed. This interference fit provides a frictional bond on the pin OD and the track casing ID. The rotation at the pin is accommodated by torsional distortion of the rubber bushing instead of sliding between the pin and a dry or lubricated track casing surface. The block and pin type tracks in current use on U. S. military vehicles use a rubber bushed pin. Advantages of the rubber bushed pin are extended track life due to reduced wear of track and pin, damping of track vibrations due to hysteresis in the rubber bushings and ease of repair by replacement of sacrificial bushings. The disadvantages of the rubber bushed pin are energy

loss in the internal friction of the rubber which reduces tractive force and vehicle speed and periodic replacement of the worn rubber bushings.

Lubricated Bearings - Lubricated bearings at the pin/track interface were introduced by the German military during World War II. This design incorporated sealed lubricated pins supported by needle bearings[4]. At that time, logistics of manufacture and supply did not permit widespread deployment of this design, however, test data show that this design has the lowest drawbar coefficient of internal resistance[10]. This is shown in Figure 5-2. Research completed by the Department of the Army in 1969, attempted to adapt a lubricated bearing pin/track interface design for use with the M60 main battle tank[15]. At that time a reversible block and pin type track using a single pin shoe was tested with a sealed lubricated pin supported by spherical TFE lined bearings. Results of field tests of this pin/track interface showed failure of seals , bearings and pins after only limited operation. One conclusion drawn from these tests was that loads encountered during vehicle operation were greater than the postulated loads used in the designs of the bearings and seals. This work illustrated the need for a better fundamental understanding of the effects of track design details on vibration damping, internal friction and the dynamic loads on track components.

A.2. Road Wheels and Track Support Rollers

In the selection of the size, number and spacing of road wheels, several factors are considered. The mean maximum pressure under the tracked vehicles must meet design requirements to reduce the motion resistance of the track as it sinks into the soil. The use of many small road wheels helps to distribute the tank weight and reduce the mean maximum pressure under the tracks, but this has the disadvantage of increasing frictional losses in the road wheels and associated track support rollers. Large road wheels can also be used in an overlapping configuration to reduce mean maximum pressure under the tracks. In addition, the number of road wheels is a factor (along with track width) in meeting the required contact area of the track. In cohesive soils, the tractive force is maximized when slip (soil shearing) is minimized. The soil shear stress is a function of the tract contact area.

Two types of road wheel/suspension configurations are used with block and pin tracks: the conventional suspension and the flat track suspension. The conventional suspension uses small roadwheels with track support rollers and the flat track suspension uses large road wheels without support rollers. The internal resistance of the conventional suspension track has been shown to be consistently greater than that of the flat track suspension[2].

APPENDIX B

BENCH TEST OF TORSIONAL STIFFNESS AND DAMPED NATURAL FREQUENCY OF A TRACK BUSHING ASSEMBLY

B.1. Purpose. The purpose of this Appendix is to document the measurement of the torsional stiffness and natural frequency of the M113 T130 track rubber bushed track/pin interface.

B.2. Summary. The measurements were completed in a simple bench test using two track links connected by a rubber bushed track/pin interface.

The torsional stiffness was measured by clamping one of the track shoes to the bench and barging a cantilevered weight from the end of the second shoe as shown in Figure B-1(a). The rotation at the pin was measured and correlated with the applied moment at the pin. The resulting torsional stiffness curve is shown in Figure B-2. A torsional stiffness of 3700 in-lb/radian is the approximate average.

The natural frequency was measured using the impulse test method by attaching an anchored potentiometer linear transducer to the end of the cantilevered track and striking the track with a rubber mallet. A five volt power supply was provided as the excitation voltage to the transducer. The output voltage was directed to a Hewlet-Packard 7090A Measurement System Plotter as shown in Figure B-1(b). A plot of one of the impulse tests is shown in Figure B-3. The damped natural frequency of the single track shoe spring-mass system was measured to be 11.5-12.5 Hz. (Note: The stiffness of the potentiometer was assumed to be negligible.) Using the decay curve shown in Figure B-3, an estimate of the damping constant and the damping ratio can be calculated as follows:

$$\text{logarithmic decrement} = \delta = \ln \left[\frac{x(t)}{x(t+T)} \right]$$

$x(t)$ = amplitude of vibration at time (t)

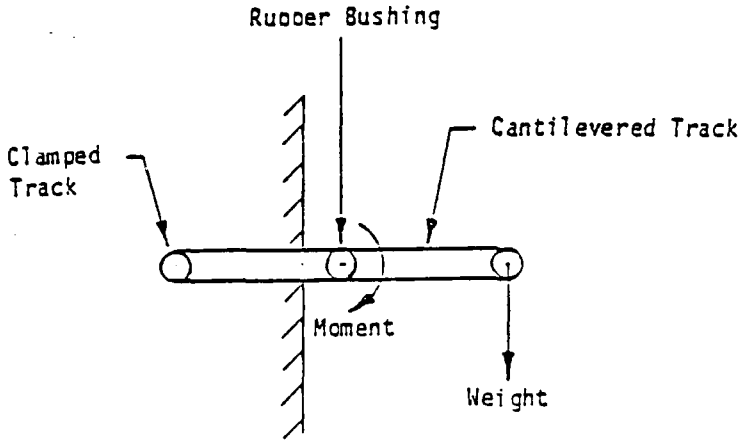
$x(t+T)$ = amplitude of vibration at time $(t+T)$

$$\delta = \ln \left[\frac{1.36 - 0.92}{1.13 - 0.92} \right] = .740$$

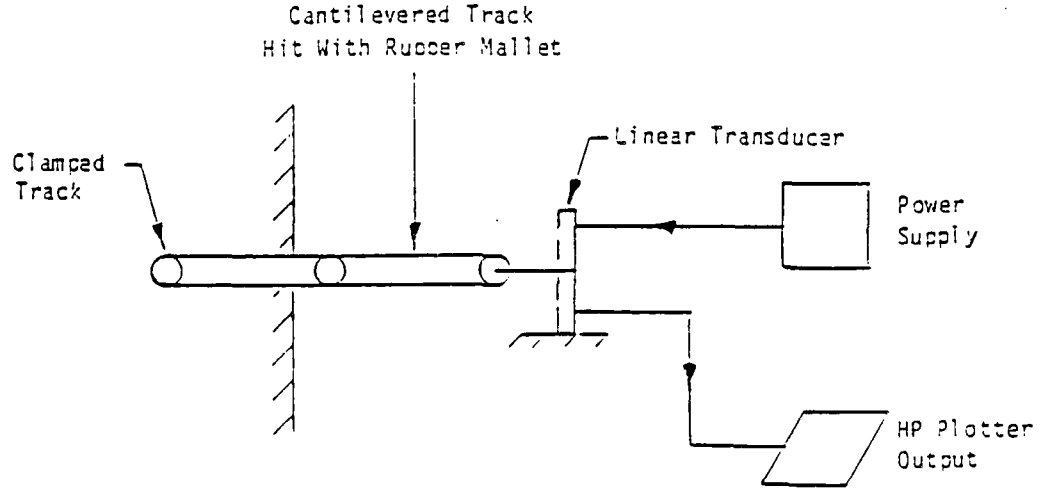
For $\delta < 1$, $\delta = 2\pi\xi$

ξ = critical damping constant

$\xi = .740/2\pi = .118$ or 11.8% of critical damping



(a) Torsional Stiffness Measurement



(b) Natural Frequency Measurement

Figure B-1. Test Configuration

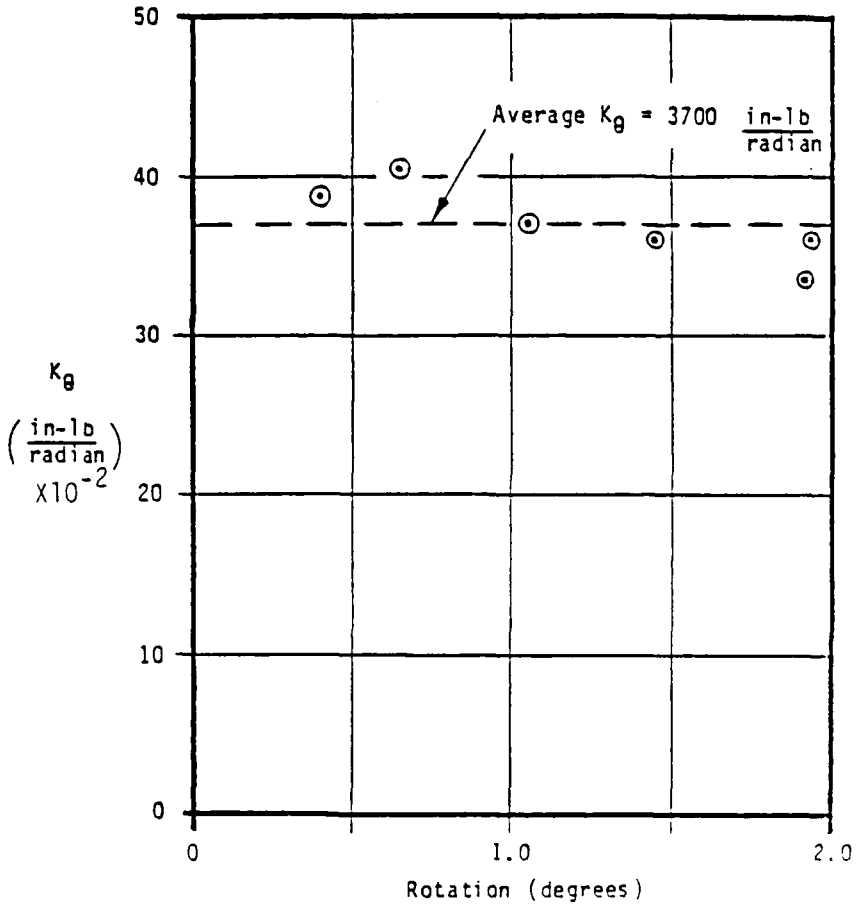


Figure B-2. Torsional Stiffness of Rubber Bushed Track/Pin Interface Assembly

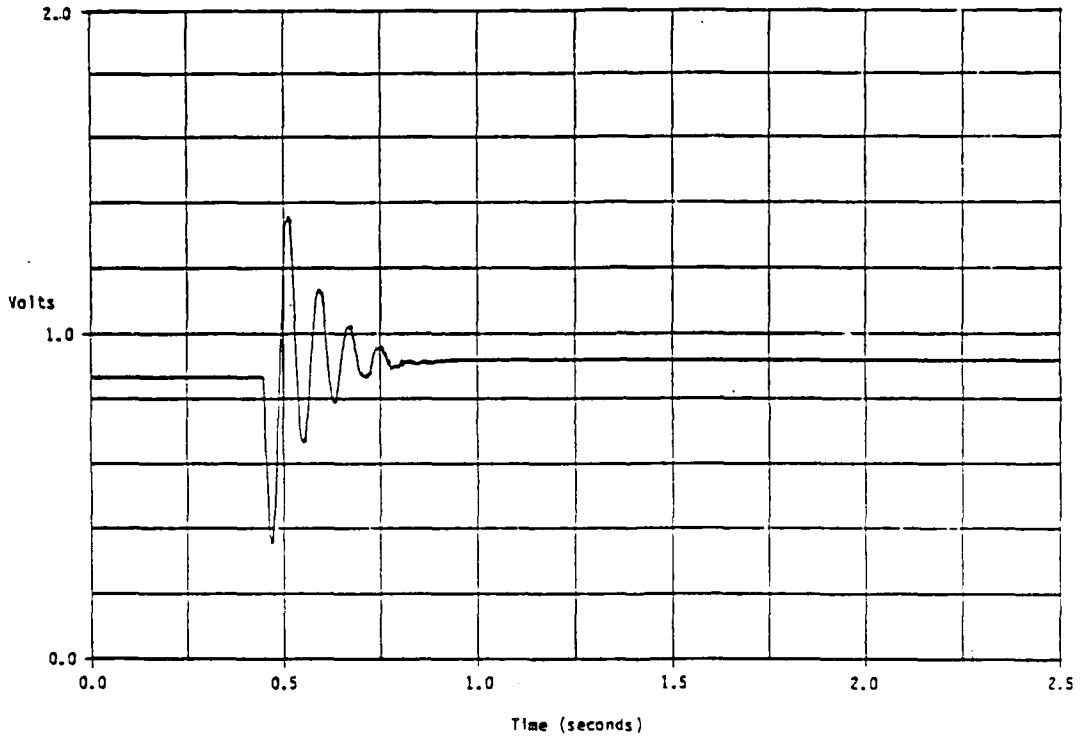


Figure B-3. Impact Test of Rubber Bushed Track/Pin Interface Assembly

APPENDIX C

LIST OF INPUT AND OUTPUT

FOR SAMPLE COMPUTER ANALYSES

This appendix contains input and output for the sample case without the track wheel interference as described on p. 35 of the report. Output results from six time steps are included to show the format and details of the computer solution.

TEST CASE FOR PERSONNEL CARRIER AT 10 MPH

Input Data
If 1, Read Restart---------- -1
Number of Cycles Between Outputs--- 10
Number of Cycles Between Monitors-- 1
Number of Cycles Between Plots----- 10
Number of Iterations Allowed------- 100

List of Items
Number of Wheels 7
Number of Links 60
Number of Drive Wheel 1
Number of Bushing Forces..... 3
Number of Bushing Resistances 2
Number of Wheel Forces..... 3
Number of Wheel Resistances.. 2
Number of Terrain Forces..... 3
Number of Terrain Resistances 2
Number of Terrain Points 2
Number of Track Shape Points 14

General Vehicle Data
Mass of Vehicle ..... .25880E+02
Rotary Inertia of Vehicle ... .12800E+06
Wind Resistance Coeff..... .00000E+00
Rotational Resistance Coeff.. .00000E+00

Initial Vehicle Position
X-Coordinate of Vehicle CG... .00000E+00
Y-Coordinate of Vehicle CG... .24000E+02
Angle of Vehicle ..... .00000E+00
Initial X Velocity of Vehicle .00000E+00
Initial Y Velocity of Vehicle .00000E+00
Initial Angular Velocity..... .00000E+00

General Link Data
Mass of One Link ..... .52000E-01
Rotary Inertia of One Link .. .21000E+01
Length of One Link ..... .60000E+01
Thickness of a Link ..... .25000E+01
Bushing Rotational Stiffness. .22400E+04
Bushing Rotational Damping .. .60000E+00

Bushing Force Data

K	Delta	Force
1	.00000E+00	.00000E+00
2	.10000E+01	.14000E+06
3	.20000E+01	.11400E+07

Bushing Resistance Data

	Velocity	Resistance
1	.00000E+00	.00000E+00
2	.10000E+04	.00000E+00

Link to Wheel Force Data

K	Delta	Force
1	.00000E+00	.00000E+00
2	.20000E+00	.20000E+05
3	.10000E+01	.20000E+07

Link to Wheel Resistance Data

	Velocity	Resistance
1	.00000E+00	.00000E+00
2	.10000E+04	.00000E+00

Link to Ground Force Data

K	Delta	Force
1	.00000E+00	.00000E+00
2	.20000E+00	.20000E+05
3	.10000E+01	.20000E+06

Link to Ground Resistance Data

	Velocity	Resistance
1	.00000E+00	.00000E+00
2	.10000E+04	.00000E+00

Wheel Input Data

K	Mass	ROTI	Radius	X-Ref	Y-Ref	NS	NV
1	.31000E+00	.20000E+02	.80000E+01	-.75000E+02	-.62500E+01	3	2

Wheel Restoring Force Data

N	Delta	X-Force	Y-Force
1	-.10000E+01	-.50000E+05	-.50000E+05
2	.00000E+00	.00000E+00	.00000E+00
3	.10000E+01	.50000E+05	.50000E+05

Wheel Restoring Resistance Data

N	Velocity	X-Resist	Y-Resist
1	-.10000E+03	-.10000E+04	-.10000E+04
2	.10000E+03	.10000E+04	.10000E+04

Wheel Input Data

K	Mass	ROTI	Radius	X-Ref	Y-Ref	NS	NV
2	.11600E+00	.20000E+02	.11500E+02	-.50000E+02	-.14250E+02	5	2

Wheel Restoring Force Data

N	Delta	X-Force	Y-Force
1	-.10000E+02	-.10000E+06	-.50000E+05
2	-.50000E+01	-.50000E+05	-.26000E+04
3	.00000E+00	.00000E+00	.00000E+00
4	.50000E+01	.50000E+05	.26000E+04
5	.10000E+02	.10000E+06	.50000E+05

Wheel Restoring Resistance Data

N	Velocity	X-Resist	Y-Resist
1	-.10000E+03	-.10000E+04	-.10000E+04
2	.10000E+03	.10000E+04	.10000E+04

Wheel Input Data

K	Mass	ROTI	Radius	X-Ref	Y-Ref	NS	NV
3	.11600E+00	.20000E+02	.11500E+02	-.25000E+02	-.14250E+02	5	2

Wheel Restoring Force Data

N	Delta	X-Force	Y-Force
1	-.10000E+02	-.10000E+06	-.50000E+05
2	-.50000E+01	-.50000E+05	-.26000E+04
3	.00000E+00	.00000E+00	.00000E+00
4	.50000E+01	.50000E+05	.26000E+04
5	.10000E+02	.10000E+06	.50000E+05

Wheel Restoring Resistance Data

N	Velocity	X-Resist	Y-Resist
1	-.10000E+03	-.10000E+04	-.10000E+04
2	.10000E+03	.10000E+04	.10000E+04

Wheel Input Data

K	Mass	ROTI	Radius	X-Ref	Y-Ref	NS	NV
4	.11600E+00	.20000E+02	.11500E+02	.00000E+00	-.14250E+02	5	2

Wheel Restoring Force Data

N	Delta	X-Force	Y-Force
1	-.10000E+02	-.10000E+06	-.50000E+05
2	-.50000E+01	-.50000E+05	-.26000E+04
3	.00000E+00	.00000E+00	.00000E+00
4	.50000E+01	.50000E+05	.26000E+04
5	.10000E+02	.10000E+06	.50000E+05

Wheel Restoring Resistance Data

N	Velocity	X-Resist	Y-Resist
1	-.10000E+03	-.10000E+04	-.10000E+04
2	.10000E+03	.10000E+04	.10000E+04

Wheel Input Data

K	Mass	ROTI	Radius	X-Ref	Y-Ref	NS	NV
5	.11600E+00	.20000E+02	.11500E+02	.25000E+02	-.14250E+02	5	2

Wheel Restoring Force Data

N	Delta	X-Force	Y-Force
1	-.10000E+02	-.10000E+06	-.50000E+05
2	-.50000E+01	-.50000E+05	-.26000E+04
3	.00000E+00	.00000E+00	.00000E+00
4	.50000E+01	.50000E+05	.26000E+04
5	.10000E+02	.10000E+06	.50000E+05

Wheel Restoring Resistance Data

N	Velocity	X-Resist	Y-Resist
1	-.10000E+03	-.10000E+04	-.10000E+04
2	.10000E+03	.10000E+04	.10000E+04

Wheel Input Data

K	Mass	ROTI	Radius	X-Ref	Y-Ref	NS	NV
6	.11600E+00	.20000E+02	.11500E+02	.50000E+02	-.14250E+02	5	2

Wheel Restoring Force Data

N	Delta	X-Force	Y-Force
1	-.10000E+02	-.10000E+06	-.50000E+05
2	-.50000E+01	-.50000E+05	-.26000E+04
3	.00000E+00	.00000E+00	.00000E+00
4	.50000E+01	.50000E+05	.26000E+04
5	.10000E+02	.10000E+06	.50000E+05

Wheel Restoring Resistance Data

N	Velocity	X-Resist	Y-Resist
1	-.10000E+03	-.10000E+04	-.10000E+04
2	.10000E+03	.10000E+04	.10000E+04

Wheel Input Data

K	Mass	ROTI	Radius	X-Ref	Y-Ref	NS	NV
7	.31000E+00	.20000E+02	.80000E+01	.75000E+02	-.11750E+02	3	2

Wheel Restoring Force Data

N	Delta	X-Force	Y-Force
1	-.10000E+01	-.50000E+05	-.50000E+05
2	.00000E+00	.00000E+00	.00000E+00
3	.10000E+01	.50000E+05	.50000E+05

Wheel Restoring Resistance Data

N	Velocity	X-Resist	Y-Resist
1	-.10000E+03	-.10000E+04	-.10000E+04
2	.10000E+03	.10000E+04	.10000E+04

Terrain Data

N	X	Y
1	-1000.000	.000
2	1000.000	.000

Link Connectivity and Equation Order

L	L1	L2	NEQ
1	60	2	1
2	1	3	4
3	2	4	10
4	3	5	16
5	4	6	22
6	5	7	28
7	6	8	34
8	7	9	40
9	8	10	46
10	9	11	52
11	10	12	58
12	11	13	64
13	12	14	70
14	13	15	76
15	14	16	82
16	15	17	88
17	16	18	94
18	17	19	100
19	18	20	106
20	19	21	112
21	20	22	118
22	21	23	124
23	22	24	130
24	23	25	136
25	24	26	142
26	25	27	148
27	26	28	154
28	27	29	160
29	28	30	166
30	29	31	172
31	30	32	178

Link Connectivity and Equation Order

L	L1	L2	MEQ
32	31	33	175
33	32	34	169
34	33	35	163
35	34	36	157
36	35	37	151
37	36	38	145
38	37	39	139
39	38	40	133
40	39	41	127
41	40	42	121
42	41	43	115
43	42	44	109
44	43	45	103
45	44	46	97
46	45	47	91
47	46	48	85
48	47	49	79
49	48	50	73
50	49	51	67
51	50	52	61
52	51	53	55
53	52	54	49
54	53	55	43
55	54	56	37
56	55	57	31
57	56	58	25
58	57	59	19
59	58	60	13
60	59	1	7

Half Band Width is 9 There are 180 Equations

Time Data
Start Time---------- .0000
Stop Time---------- 1.0000
Time Step Value---------- .0001
Drive Wheel RPM at Start------ 2.5000
Drive Wheel RPM at End-------- 2.5000

THE FOLLOWING VARIABLES ARE TO BE MONITORED

MONITOR 1	TENS1	1	MONITOR 2	TENS1	11	MONITOR 3	TENS1	21	MONITOR 4	TENS1	31	MONITOR 5	TENS1	41
MONITOR 6	TENS1	51	MONITOR 7	XL	1	MONITOR 8	YL	1	MONITOR 9	XL	11	MONITOR 10	YL	11
MONITOR 11	XL	14	MONITOR 12	YL	14	MONITOR 13	XL	21	MONITOR 14	YL	21	MONITOR 15	XL	31
MONITOR 16	YL	31	MONITOR 17	XL	41	MONITOR 18	YL	41	MONITOR 19	XL	46	MONITOR 20	YL	46
MONITOR 21	XL	51	MONITOR 22	YL	51	MONITOR 23	XLDOT	1	MONITOR 24	YLDOT	1	MONITOR 25	XLDOT	11
MONITOR 26	YLDOT	11	MONITOR 27	XLDOT	14	MONITOR 28	YLDOT	14	MONITOR 29	XLDOT	21	MONITOR 30	YLDOT	21
MONITOR 31	XLDOT	31	MONITOR 32	YLDOT	31	MONITOR 33	XLDOT	41	MONITOR 34	YLDOT	41	MONITOR 35	XLDOT	51
MONITOR 36	YLDOT	51	MONITOR 37	XW	1	MONITOR 38	XW	2	MONITOR 39	XW	3	MONITOR 40	XW	4
MONITOR 41	XW	5	MONITOR 42	XW	6	MONITOR 43	XW	7	MONITOR 44	YW	1	MONITOR 45	YW	2
MONITOR 46	YW	3	MONITOR 47	YW	4	MONITOR 48	YW	5	MONITOR 49	YW	6	MONITOR 50	YW	7

THERE ARE 50 MONITORS

OUTPUT AT TIME .0000

Displacements, Velocities, and Accelerations

	X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Vehicle	.00000E+00	.24000E+02	.00000E+00	-.14530E+03	.00000E+00	.00000E+00	.35229E+03	.14714E+05	.13395E+01
Wheel 1	-.74882E+02	.21536E+02	.00000E+00	-.14530E+03	.00000E+00	.15708E+02	-.15975E+05	-.61449E+06	.00000E+00
Wheel 2	-.69691E+02	.14411E+02	.00000E+00	-.14530E+03	.00000E+00	.11396E+02	-.26324E+05	-.20615E+05	.00000E+00
Wheel 3	-.24995E+02	.14044E+02	.00000E+00	-.14530E+03	.00000E+00	.11396E+02	-.43499E+03	-.19321E+05	.00000E+00
Wheel 4	.21929E-01	.13952E+02	.00000E+00	-.14530E+03	.00000E+00	.11396E+02	-.18532E+04	-.18789E+05	.00000E+00
Wheel 5	.25800E+02	.13726E+02	.00000E+00	-.14530E+03	.00000E+00	.11396E+02	-.69000E+05	-.18208E+05	.00000E+00
Wheel 6	.49944E+02	.13651E+02	.00000E+00	-.14530E+03	.00000E+00	.11396E+02	.49884E+04	-.20919E+05	.00000E+00
Wheel 7	.74848E+02	.16061E+02	.00000E+00	-.14530E+03	.00000E+00	.15708E+02	.20009E+05	-.61951E+06	.00000E+00
Link 1	.39392E-02	.26702E+02	.31128E+01	-.29054E+03	.61888E+01	.00000E+00	-.39068E+03	-.13010E+05	-.14975E+03
Link 2	-.59202E+01	.26923E+02	.30956E+01	-.29044E+03	.66861E+01	.00000E+00	-.11567E+04	.69045E+03	.22599E+03
Link 3	-.11861E+02	.27234E+02	.30827E+01	-.29035E+03	.85477E+01	.00000E+00	-.60155E+04	-.49428E+03	-.17294E+03
Link 4	-.17761E+02	.27587E+02	.30815E+01	-.29033E+03	.87319E+01	.00000E+00	.14119E+05	.31063E+03	-.19537E+03
Link 5	-.23682E+02	.27781E+02	.31357E+01	-.29059E+03	.85038E+00	.00000E+00	-.62662E+06	-.36011E+04	.17226E+04
Link 6	-.29840E+02	.27857E+02	.31205E+01	-.29057E+03	.30601E+01	.00000E+00	.59208E+04	.43635E+05	-.66772E+02
Link 7	-.35983E+02	.28212E+02	.30479E+01	-.28996E+03	.13591E+02	.00000E+00	.61264E+04	.23759E+05	-.39791E+03
Link 8	-.42123E+02	.28568E+02	.31235E+01	-.29057E+03	.26258E+01	.00000E+00	.65055E+04	-.99398E+05	.95967E+02
Link 9	-.48258E+02	.28923E+02	.30356E+01	-.28978E+03	.15372E+02	.00000E+00	.50829E+04	.15512E+06	.15889E+04
Link 10	-.54391E+02	.29278E+02	-.31404E+01	-.29060E+03	-.16675E+00	.00000E+00	-.57155E+03	-.15189E+06	-.56470E+04
Link 11	-.60518E+02	.29634E+02	.30168E+01	-.28947E+03	.18092E+02	.00000E+00	-.84831E+04	.11422E+06	.52726E+04
Link 12	-.66667E+02	.29989E+02	-.31263E+01	-.29058E+03	-.22285E+01	.00000E+00	-.66845E+04	-.22343E+06	.40997E+04
Link 13	-.72719E+02	.30591E+02	.29051E+01	-.28655E+03	.34048E+02	.00000E+00	.17472E+05	.49639E+06	.87112E+03
Link 14	-.78453E+02	.30052E+02	-.26670E+01	-.27454E+03	-.66398E+02	.00000E+00	.32478E+06	-.53381E+06	-.25166E+05
Link 15	-.82909E+02	.26175E+02	-.21988E+01	-.23066E+03	-.11758E+03	.00000E+00	.34876E+05	.33251E+06	-.15071E+04
Link 16	-.84175E+02	.20836E+02	-.14006E+01	-.12069E+03	-.14320E+03	.00000E+00	-.34035E+04	-.21328E+06	-.47567E+04
Link 17	-.81854E+02	.15464E+02	-.91643E+00	-.56862E+02	-.11528E+03	.00000E+00	.11983E+06	.10754E+06	.53529E+03
Link 18	-.77054E+02	.12490E+02	-.20214E+00	-.29584E+01	-.29171E+02	.00000E+00	.42211E+04	-.42934E+05	.19779E+04
Link 19	-.71354E+02	.10627E+02	-.43088E+00	-.13280E+02	-.60686E+02	.00000E+00	.69748E+04	-.66907E+05	-.70379E+03
Link 20	-.65818E+02	.81933E+01	-.39297E+00	-.11075E+02	-.55640E+02	.00000E+00	.86902E+04	.93119E+05	.57058E+03
Link 21	-.60295E+02	.57592E+01	-.44367E+00	-.14067E+02	-.62370E+02	.00000E+00	.85992E+04	-.12815E+06	-.29704E+03
Link 22	-.55006E+02	.28223E+01	-.56421E+00	-.22520E+02	-.77698E+02	.00000E+00	.33520E+05	.54141E+05	-.29433E+01
Link 23	-.49414E+02	.11144E+01	-.26517E-01	-.51082E-01	-.38525E+01	.00000E+00	.72436E+04	.39366E+06	.38517E+03
Link 24	-.43360E+02	.12308E+01	.56918E-01	-.23529E+00	.82656E+01	.00000E+00	.67183E+04	-.82441E+05	-.29861E+03
Link 25	-.37306E+02	.12308E+01	-.50668E-01	-.18647E+00	-.73589E+01	.00000E+00	.62348E+04	.11887E+06	.10066E+03
Link 26	-.31248E+02	.12307E+01	.46723E-01	-.15856E+00	.67862E+01	.00000E+00	.64069E+04	-.67688E+04	.36963E+02
Link 27	-.25184E+02	.12958E+01	-.23520E-01	-.40188E-01	-.34172E+01	.00000E+00	.49189E+04	.10668E+05	-.16168E+03
Link 28	-.19116E+02	.12305E+01	.17834E-02	-.23107E-03	.25913E+00	.00000E+00	.42506E+04	.42026E+05	.24637E+03
Link 29	-.13045E+02	.12304E+01	-.23884E-02	-.41441E-03	-.34702E+00	.00000E+00	.22988E+04	.23266E+05	-.27557E+03
Link 30	-.69731E+01	.12303E+01	.35241E-02	-.90224E-03	.51204E+00	.00000E+00	-.48103E+03	.62980E+05	.37932E+03
Link 31	-.90151E+00	.12365E+01	-.34533E-02	-.86636E-03	-.50176E+00	.00000E+00	-.35580E+04	-.11612E+05	-.18046E+03
Link 32	.51688E+01	.12301E+01	.38120E-02	-.10557E-02	.55387E+00	.00000E+00	-.10121E+05	.80714E+05	.87004E+02
Link 33	.11235E+02	.12300E+01	-.66677E-02	-.32299E-02	-.96881E+00	.00000E+00	-.14836E+05	-.15020E+05	-.34415E+03
Link 34	.17296E+02	.12300E+01	.10373E-01	-.78169E-02	.15072E+01	.00000E+00	-.11331E+05	.12015E+06	.13097E+04
Link 35	.23352E+02	.12129E+01	-.22482E-01	-.36720E-01	-.32664E+01	.00000E+00	-.44554E+04	-.49077E+05	-.62224E+03
Link 36	.29404E+02	.12298E+01	.36577E-01	-.97182E-01	.53133E+01	.00000E+00	.93625E+04	.19764E+06	.68871E+03
Link 37	.35458E+02	.12297E+01	-.47863E-01	-.16640E+00	-.69518E+01	.00000E+00	.86206E+04	-.19770E+06	-.26952E+04
Link 38	.41509E+02	.12296E+01	.65883E-01	-.31522E+00	.95658E+01	.00000E+00	.90389E+03	.34209E+06	-.10515E+04
Link 39	.47544E+02	.11316E+01	-.11831E+00	-.10157E+01	-.17150E+02	.00000E+00	.29073E+05	-.87404E+05	.41951E+04
Link 40	.53514E+02	.14192E+01	.23488E+00	-.39896E+01	.33815E+02	.00000E+00	-.79247E+05	.33595E+06	-.22147E+04
Link 41	.59267E+02	.32857E+01	.37343E+00	-.10014E+02	.53006E+02	.00000E+00	.23325E+05	-.29262E+06	.55247E+02
Link 42	.65099E+02	.46151E+01	.89983E-01	-.58784E+00	.13057E+02	.00000E+00	.18709E+05	.22113E+06	.12071E+04

Displacements, Velocities, and Accelerations

		X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Link	43	.70969E+02	.59445E+01	.34614E+00	-.85194E+01	.49022E+02	.00000E+00	.87068E+04	-.65016E+05	.47560E+04
Link	44	.76854E+02	.70123E+01	.10684E-01	-.82924E-02	.15523E+01	.00000E+00	-.65032E+04	-.21226E+06	-.52489E+04
Link	45	.81806E+02	.93168E+01	.88799E+00	-.53619E+02	.11272E+03	.00000E+00	-.17488E+05	.68659E+06	.77698E+03
Link	46	.84013E+02	.14833E+02	.14833E+01	-.13260E+03	.14474E+03	.00000E+00	-.13599E+06	.57683E+05	-.29953E+04
Link	47	.82851E+02	.20684E+02	.20654E+01	-.21426E+03	.12789E+03	.00000E+00	-.30681E+06	-.17873E+06	-.14450E+05
Link	48	.78505E+02	.26545E+02	.27776E+01	-.28108E+03	.51728E+02	.00000E+00	-.16790E+06	-.46967E+06	-.18122E+04
Link	49	.72551E+02	.25130E+02	-.29896E+01	-.28892E+03	-.22003E+02	.00000E+00	.47450E+05	.26965E+06	-.18527E+05
Link	50	.66456E+02	.25209E+02	.29845E+01	-.28881E+03	.22727E+02	.00000E+00	.20499E+05	-.37006E+06	.12597E+05
Link	51	.60350E+02	.25289E+02	-.30358E+01	-.28978E+03	-.15348E+02	.00000E+00	-.57123E+04	.25447E+06	.28461E+04
Link	52	.54294E+02	.25716E+02	.28984E+01	-.28632E+03	.34983E+02	.00000E+00	-.11333E+05	.14035E+06	-.20269E+04
Link	53	.48226E+02	.26271E+02	-.30612E+01	-.29013E+03	-.11671E+02	.00000E+00	.47346E+05	-.45251E+06	.72477E+03
Link	54	.42116E+02	.25526E+02	-.30080E+01	-.28930E+03	-.19350E+02	.00000E+00	-.17077E+05	.49836E+06	-.38060E+04
Link	55	.36016E+02	.25605E+02	.30087E+01	-.28932E+03	.19267E+02	.00000E+00	-.76298E+04	-.13315E+06	-.13747E+05
Link	56	.29893E+02	.25833E+02	-.30745E+01	-.29027E+03	-.97448E+01	.00000E+00	.13967E+05	-.15360E+06	-.60413E+04
Link	57	.23840E+02	.26339E+02	.28951E+01	-.28621E+03	.35448E+02	.00000E+00	.28724E+05	.68399E+05	.19561E+05
Link	58	.17793E+02	.26965E+02	-.31061E+01	-.29051E+03	-.51509E+01	.00000E+00	.55140E+06	.27421E+04	-.12813E+04
Link	59	.11862E+02	.26735E+02	-.30996E+01	-.29047E+03	-.60961E+01	.00000E+00	.50733E+04	-.29404E+04	.55364E+03
Link	60	.59311E+01	.26612E+02	.31407E+01	-.29060E+03	.13551E+00	.00000E+00	.13283E+05	-.52631E+03	-.30661E+03

Forces and Moments

		FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Vehicle		.91173E+04	.38079E+06	.17145E+06						
Wheel	1	-.69522E+04	-.19049E+06	.00000E+00						
Wheel	2	-.30536E+04	-.23913E+04	.00000E+00						
Wheel	3	-.50459E+02	-.22412E+04	.00000E+00						
Wheel	4	-.21497E+03	-.21796E+04	.00000E+00						
Wheel	5	-.80040E+04	-.21121E+04	.00000E+00						
Wheel	6	.57866E+03	-.24267E+04	.00000E+00						
Wheel	7	.62029E+04	-.19205E+06	.00000E+00						
Link	1	-.12319E-01	-.11362E+02	.00000E+00	-.10023E+05	-.10025E+03	.10002E+05	-.56492E+03	.62496E+02	-.38528E+02
Link	2	.00000E+00	-.20093E+02	.00000E+00	-.10002E+05	.56492E+03	.99423E+04	-.50893E+03	.38528E+02	-.28739E+02
Link	3	.00000E+00	-.20093E+02	.00000E+00	-.99423E+04	.50893E+03	.96295E+04	-.51454E+03	.28739E+02	-.28448E+01
Link	4	.00000E+00	-.20093E+02	.00000E+00	-.96295E+04	.51454E+03	.10366E+05	-.51060E+03	.28448E+01	.12159E+03
Link	5	.00000E+00	-.20093E+02	.00000E+00	-.10366E+05	.51060E+03	-.22220E+05	-.67776E+03	-.12159E+03	-.34070E+02
Link	6	.00000E+00	-.20093E+02	.00000E+00	.22220E+05	.67776E+03	-.21912E+05	.16113E+04	.34070E+02	-.16265E+03
Link	7	.00000E+00	-.20093E+02	.00000E+00	.21912E+05	-.16113E+04	-.21594E+05	.28669E+04	.16265E+03	.16934E+03
Link	8	.00000E+00	-.20093E+02	.00000E+00	.21594E+05	-.28669E+04	-.21256E+05	-.22817E+04	-.16934E+03	-.19694E+03
Link	9	.00000E+00	-.20093E+02	.00000E+00	.21256E+05	.22817E+04	-.20991E+05	.58044E+04	.19694E+03	.23999E+03
Link	10	.00000E+00	-.20093E+02	.00000E+00	.20991E+05	-.58044E+04	-.21021E+05	-.20738E+04	-.23999E+03	-.28222E+03
Link	11	.00000E+00	-.20093E+02	.00000E+00	.21021E+05	.20738E+04	-.21462E+05	.38857E+04	.28222E+03	.31400E+03
Link	12	.00000E+00	-.20093E+02	.00000E+00	.21462E+05	-.38857E+04	-.21810E+05	-.77124E+04	-.31400E+03	-.56419E+03
Link	13	.00000E+00	-.20093E+02	.00000E+00	.21810E+05	.77124E+04	-.20901E+05	.18120E+05	.56419E+03	.15929E+04
Link	14	-.58691E+03	.13793E+04	.00000E+00	.20901E+05	-.18120E+05	-.34256E+04	-.11017E+05	-.15929E+04	.10489E+04
Link	15	.00000E+00	-.20093E+02	.00000E+00	.34256E+04	.11017E+05	-.16121E+04	.62932E+04	-.10489E+04	.17878E+04
Link	16	.00000E+00	-.20093E+02	.00000E+00	.16121E+04	-.62932E+04	-.17891E+04	-.47773E+04	-.17878E+04	.10846E+04
Link	17	-.37585E+03	-.34741E+03	.00000E+00	.17891E+04	.47773E+04	.48179E+04	.11624E+04	-.10846E+04	.16000E+04
Link	18	.00000E+00	-.20093E+02	.00000E+00	-.48179E+04	-.11624E+04	.50374E+04	-.10501E+04	-.16000E+04	-.51236E+03
Link	19	.00000E+00	-.20093E+02	.00000E+00	-.50374E+04	.10501E+04	.54000E+04	-.45091E+04	.51236E+03	.84905E+02
Link	20	.00000E+00	-.20093E+02	.00000E+00	-.54000E+04	.45091E+04	.58415E+04	.35312E+03	-.84905E+02	-.11356E+03
Link	21	.00000E+00	-.20093E+02	.00000E+00	-.58415E+04	-.35312E+03	.62887E+04	-.62907E+04	.11356E+03	-.27001E+03
Link	22	-.33385E+02	-.97251E+02	.00000E+00	-.62887E+04	.62907E+04	.80671E+04	-.33781E+04	.27001E+03	.12044E+04
Link	23	.00000E+00	.13543E+05	.00000E+00	-.80671E+04	.33781E+04	.84438E+04	.35492E+04	-.12044E+04	.18689E+03

Forces and Moments

		FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Link	24	.00000E+00	.18959E+04	.00000E+00	-.84438E+04	-.35492E+04	.87931E+04	-.26336E+04	-.18689E+03	-.24099E+03
Link	25	.00000E+00	.19049E+04	.00000E+00	-.87931E+04	.26336E+04	.91176E+04	.16426E+04	.24099E+03	.21816E+03
Link	26	.00000E+00	.19139E+04	.00000E+00	-.91174E+04	-.16426E+04	.94505E+04	-.62325E+03	-.21816E+03	-.15734E+03
Link	27	-.54133E+03	-.56350E+02	.00000E+00	-.94505E+04	.62325E+03	.97068E+04	-.11983E+02	.15734E+03	.56681E+02
Link	28	.00000E+00	.19319E+04	.00000E+00	-.97068E+04	.11983E+02	.99279E+04	.26147E+03	-.56681E+02	-.93448E+01
Link	29	.00000E+00	.19409E+04	.00000E+00	-.99279E+04	-.26147E+03	.10047E+05	-.48960E+03	.93448E+01	.13244E+02
Link	30	.00000E+00	.19499E+04	.00000E+00	-.10047E+05	.48960E+03	.10022E+05	.83548E+03	-.13244E+02	-.15629E+02
Link	31	-.43015E+01	.12727E+04	.00000E+00	-.10022E+05	-.83548E+03	.98617E+04	-.10410E+04	.15629E+02	.16274E+02
Link	32	.00000E+00	.19679E+04	.00000E+00	-.98617E+04	.10410E+04	.93154E+04	.11882E+04	-.16274E+02	-.23474E+02
Link	33	.00000E+00	.19759E+04	.00000E+00	-.93154E+04	-.11882E+04	.85439E+04	-.15688E+04	.23474E+02	.38171E+02
Link	34	.00000E+00	.19849E+04	.00000E+00	-.85439E+04	.15688E+04	.79547E+04	.26940E+04	-.38171E+02	-.73596E+02
Link	35	.00000E+00	.36929E+04	.00000E+00	-.79547E+04	-.26940E+04	.77231E+04	-.35509E+04	.73596E+02	.13229E+03
Link	36	.00000E+00	.20029E+04	.00000E+00	-.77231E+04	.35509E+04	.82099E+04	.47236E+04	-.13229E+03	-.18914E+03
Link	37	.00000E+00	.20119E+04	.00000E+00	-.82099E+04	-.47236E+04	.86582E+04	-.75685E+04	.18914E+03	.25479E+03
Link	38	.00000E+00	.20209E+04	.00000E+00	-.86582E+04	.75685E+04	.87052E+04	.81994E+04	-.25479E+03	-.41259E+03
Link	39	-.51379E+02	.11556E+05	.00000E+00	-.87052E+04	-.81994E+04	.10268E+05	-.79015E+04	.41259E+03	.79115E+03
Link	40	.22168E+03	-.77958E+03	.00000E+00	-.10268E+05	.79015E+04	.59258E+04	.10347E+05	-.79115E+03	.31035E+03
Link	41	.00000E+00	-.20093E+02	.00000E+00	-.59258E+04	-.10347E+05	.71387E+04	-.48487E+04	-.31035E+03	-.63492E+03
Link	42	.00000E+00	-.20093E+02	.00000E+00	-.71387E+04	.48487E+04	.81115E+04	.66700E+04	.63492E+03	.56931E+03
Link	43	.00000E+00	-.20093E+02	.00000E+00	-.81115E+04	-.66700E+04	.85643E+04	.33093E+04	-.56931E+03	-.74694E+03
Link	44	.00000E+00	-.20093E+02	.00000E+00	-.85643E+04	-.33093E+04	.82261E+04	-.77084E+04	.74694E+03	.19652E+04
Link	45	.00000E+00	-.20093E+02	.00000E+00	-.82261E+04	.77084E+04	.73167E+04	.28015E+05	-.19652E+04	.13335E+04
Link	46	.28471E+03	-.58246E+02	.00000E+00	-.73167E+04	-.28015E+05	-.39389E+02	.31072E+05	-.13335E+04	.13038E+04
Link	47	.66779E+03	.36564E+03	.00000E+00	.39389E+02	-.31072E+05	-.16661E+05	.21413E+05	-.13038E+04	.15954E+04
Link	48	.44463E+03	.10115E+04	.00000E+00	.16661E+05	-.21413E+05	-.25837E+05	-.40216E+04	-.15954E+04	.11559E+04
Link	49	.00000E+00	-.20093E+02	.00000E+00	.25837E+05	.40216E+04	-.23369E+05	.89804E+04	-.11559E+04	-.69234E+03
Link	50	.00000E+00	-.20093E+02	.00000E+00	.23369E+05	-.89804E+04	-.22303E+05	-.10243E+05	.69234E+03	.58887E+03
Link	51	.00000E+00	-.20093E+02	.00000E+00	.22303E+05	.10243E+05	-.22601E+05	.30099E+04	-.58887E+03	-.78172E+03
Link	52	.00000E+00	-.20093E+02	.00000E+00	.22601E+05	-.30099E+04	-.23190E+05	.10328E+05	.78172E+03	.72477E+03
Link	53	-.18796E+03	.13608E+04	.00000E+00	.23190E+05	-.10328E+05	-.20540E+05	-.14563E+05	-.72477E+03	.11908E+03
Link	54	.00000E+00	-.20093E+02	.00000E+00	.20540E+05	.14563E+05	-.21428E+05	.11372E+05	-.11908E+03	-.59678E+03
Link	55	.00000E+00	-.20093E+02	.00000E+00	.21428E+05	-.11372E+05	-.21825E+05	.44681E+04	.59678E+03	.44793E+03
Link	56	.00000E+00	-.20093E+02	.00000E+00	.21825E+05	-.44681E+04	-.21098E+05	-.34992E+04	-.44793E+03	-.70240E+03
Link	57	.00000E+00	-.20093E+02	.00000E+00	.21098E+05	.34992E+04	-.19605E+05	.77648E+02	.70240E+03	.63148E+03
Link	58	.00000E+00	-.20093E+02	.00000E+00	.19605E+05	-.77648E+02	.90682E+04	.24033E+03	-.63148E+03	.14582E+02
Link	59	.00000E+00	-.20093E+02	.00000E+00	-.90682E+04	-.24033E+03	.93320E+04	.10752E+03	-.14582E+02	-.96096E+02
Link	60	.00000E+00	-.20093E+02	.00000E+00	-.93320E+04	-.10752E+03	.10023E+05	.10025E+03	.96096E+02	-.62496E+02

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2	
1	.60000E+01	.10023E+05	.10018E+05	.71591E-01	.71606E-03	-.71446E-01	.40352E-02	.71595E-01	.71560E-01	Wheel 4
2	.60000E+01	.10018E+05	.99553E+04	.71446E-01	-.40352E-02	-.71016E-01	.36352E-02	.71560E-01	.71109E-01	
3	.60000E+01	.99553E+04	.96432E+04	.71016E-01	-.36352E-02	-.68782E-01	.36753E-02	.71109E-01	.68880E-01	
4	.60000E+01	.96432E+04	.10376E+05	.68782E-01	-.36753E-02	-.74026E-01	.36471E-02	.68880E-01	.74116E-01	
5	.60000E+01	.10376E+05	.22231E+05	.74026E-01	-.36471E-02	.15872E+00	.48411E-02	.74116E-01	.15879E+00	
6	.60000E+01	.22231E+05	.21972E+05	-.15872E+00	-.48611E-02	.15652E+00	-.11510E-01	.15879E+00	.15694E+00	
7	.60000E+01	.21972E+05	.21783E+05	-.15652E+00	.11510E-01	.15424E+00	-.20478E-01	.15694E+00	.15560E+00	
8	.60000E+01	.21783E+05	.21378E+05	-.15424E+00	.20478E-01	.15183E+00	.16298E-01	.15560E+00	.15270E+00	
9	.60000E+01	.21378E+05	.21779E+05	-.15183E+00	-.16298E-01	.14994E+00	-.41460E-01	.15270E+00	.15556E+00	
10	.60000E+01	.21779E+05	.21123E+05	-.14994E+00	.41460E-01	.15015E+00	.14813E-01	.15556E+00	.15088E+00	
11	.60000E+01	.21123E+05	.21811E+05	-.15015E+00	-.14813E-01	.15330E+00	-.27755E-01	.15088E+00	.15579E+00	
12	.60000E+01	.21811E+05	.23133E+05	-.15330E+00	.27755E-01	.15578E+00	.55089E-01	.15579E+00	.16524E+00	

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2	
13	.60000E+01	.23133E+05	.27662E+05	-.15578E+00	-.55089E-01	.14929E+00	-.12943E+00	.16524E+00	.19759E+00	
14	.60000E+01	.27662E+05	.11538E+05	-.14929E+00	.12943E+00	.24469E-01	.78695E-01	.19759E+00	.82411E-01	Wheel 1
15	.60000E+01	.11538E+05	.64964E+04	-.24469E-01	-.78695E-01	.11515E-01	.44951E-01	.82411E-01	.64403E-01	
16	.60000E+01	.64964E+04	.51013E+04	-.11515E-01	.44951E-01	.12779E-01	.34124E-01	.64403E-01	.36438E-01	
17	.60000E+01	.51013E+04	.49561E+04	-.12779E-01	-.34124E-01	-.34413E-01	-.83029E-02	.36438E-01	.35401E-01	Wheel 1
18	.60000E+01	.49561E+04	.51456E+04	.34413E-01	.83029E-02	-.35981E-01	.75004E-02	.35401E-01	.36755E-01	
19	.60000E+01	.51456E+04	.70351E+04	.35981E-01	-.75004E-02	-.38572E-01	.32208E-01	.36755E-01	.50251E-01	
20	.60000E+01	.70351E+04	.58522E+04	.38572E-01	-.32208E-01	-.41725E-01	-.25223E-02	.50251E-01	.41801E-01	
21	.60000E+01	.58522E+04	.88950E+04	.41725E-01	.25223E-02	-.44919E-01	.44934E-01	.41801E-01	.63536E-01	
22	.60000E+01	.88950E+04	.87459E+04	.44919E-01	-.44934E-01	-.37622E-01	.26130E-01	.63536E-01	.62471E-01	Wheel 2
23	.60000E+01	.87459E+04	.91594E+04	.37622E-01	-.26130E-01	-.60313E-01	-.25352E-01	.62471E-01	.65424E-01	Ground
24	.60000E+01	.91594E+04	.91791E+04	.60313E-01	.25352E-01	-.62808E-01	.18811E-01	.65424E-01	.65565E-01	Ground
25	.60000E+01	.91791E+04	.92641E+04	.62808E-01	-.18811E-01	-.65124E-01	-.11733E-01	.65565E-01	.66172E-01	Ground
26	.60000E+01	.92641E+04	.94710E+04	.65124E-01	.11733E-01	-.67504E-01	.44518E-02	.66172E-01	.67650E-01	Ground
27	.60000E+01	.94710E+04	.97068E+04	.67504E-01	-.44518E-02	-.69335E-01	.85593E-04	.67650E-01	.69335E-01	Wheel 3
28	.60000E+01	.97068E+04	.99308E+04	.69335E-01	-.85593E-04	-.70913E-01	-.17248E-02	.69335E-01	.70934E-01	Ground
29	.60000E+01	.99308E+04	.10059E+05	.70913E-01	.17248E-02	-.71767E-01	.34971E-02	.70934E-01	.71852E-01	Ground
30	.60000E+01	.10059E+05	.10057E+05	.71767E-01	-.34971E-02	-.71589E-01	-.59677E-02	.71852E-01	.71837E-01	Ground
31	.60000E+01	.10057E+05	.98966E+04	.71589E-01	.59677E-02	-.70298E-01	.74359E-02	.71837E-01	.70690E-01	Ground and Wheel 4
32	.60000E+01	.98966E+04	.93909E+04	.70298E-01	-.74359E-02	-.66538E-01	-.84872E-02	.70690E-01	.67078E-01	Ground
33	.60000E+01	.93909E+04	.86868E+04	.66538E-01	.84872E-02	-.61028E-01	.11205E-01	.67078E-01	.62048E-01	Ground
34	.60000E+01	.86868E+04	.83966E+04	.61028E-01	-.11205E-01	-.56820E-01	-.19243E-01	.62048E-01	.59990E-01	Ground
35	.60000E+01	.83986E+04	.85003E+04	.56820E-01	.19243E-01	-.55165E-01	.25364E-01	.59990E-01	.60716E-01	Ground
36	.60000E+01	.85003E+04	.94718E+04	.55165E-01	-.25364E-01	-.58642E-01	-.33740E-01	.60716E-01	.67656E-01	Ground
37	.60000E+01	.94718E+04	.11500E+05	.58642E-01	.33740E-01	-.61844E-01	.54061E-01	.67656E-01	.82142E-01	Ground
38	.60000E+01	.11500E+05	.11959E+05	.61844E-01	-.54061E-01	-.62180E-01	-.58567E-01	.82142E-01	.85419E-01	Ground
39	.60000E+01	.11959E+05	.12957E+05	.62180E-01	.58567E-01	-.73345E-01	.56439E-01	.85419E-01	.92547E-01	Ground and Wheel 6
40	.60000E+01	.12957E+05	.11924E+05	.73345E-01	-.56439E-01	-.42327E-01	-.73910E-01	.92547E-01	.85172E-01	Wheel 6
41	.60000E+01	.11924E+05	.86296E+04	.42327E-01	.73910E-01	-.50991E-01	.34633E-01	.85172E-01	.61640E-01	
42	.60000E+01	.86296E+04	.10502E+05	.50991E-01	-.34633E-01	-.57939E-01	-.47643E-01	.61640E-01	.75012E-01	
43	.60000E+01	.10502E+05	.91814E+04	.57939E-01	.47643E-01	-.61173E-01	-.23638E-01	.75012E-01	.65581E-01	
44	.60000E+01	.91814E+04	.11273E+05	.61173E-01	.23638E-01	-.58758E-01	.55060E-01	.65581E-01	.80524E-01	
45	.60000E+01	.11273E+05	.28954E+05	.58758E-01	-.55060E-01	-.52262E-01	-.20010E+00	.80524E-01	.20682E+00	
46	.60000E+01	.28954E+05	.31072E+05	.52262E-01	.20010E+00	.28135E-03	-.22195E+00	.20682E+00	.22195E+00	Wheel 7
47	.60000E+01	.31072E+05	.27131E+05	-.28135E-03	.22195E+00	.11901E+00	-.15295E+00	.22195E+00	.19379E+00	Wheel 7
48	.60000E+01	.27131E+05	.26148E+05	-.11901E+00	.15295E+00	.18455E+00	.28726E-01	.19379E+00	.18677E+00	Wheel 7
49	.60000E+01	.26148E+05	.25035E+05	-.18455E+00	-.28726E-01	.16692E+00	-.66145E-01	.18677E+00	.17882E+00	
50	.60000E+01	.25035E+05	.24543E+05	-.16692E+00	.66145E-01	.15931E+00	.73162E-01	.17882E+00	.17531E+00	
51	.60000E+01	.24543E+05	.22800E+05	-.15931E+00	-.73162E-01	.16143E+00	-.21499E-01	.17531E+00	.16286E+00	
52	.60000E+01	.22800E+05	.25386E+05	-.16143E+00	.21499E-01	.16564E+00	-.73772E-01	.16286E+00	.18133E+00	
53	.60000E+01	.25386E+05	.25179E+05	-.16564E+00	.73772E-01	.14671E+00	.10402E+00	.18133E+00	.17985E+00	Wheel 6
54	.60000E+01	.25179E+05	.24258E+05	-.14671E+00	-.10402E+00	.15306E+00	-.81226E-01	.17985E+00	.17327E+00	
55	.60000E+01	.24258E+05	.22277E+05	-.15306E+00	.81226E-01	.15589E+00	-.31915E-01	.17327E+00	.15912E+00	
56	.60000E+01	.22277E+05	.21387E+05	-.15589E+00	.31915E-01	.15070E+00	.24994E-01	.15912E+00	.15276E+00	
57	.60000E+01	.21387E+05	.19605E+05	-.15070E+00	-.24994E-01	.14003E+00	-.55463E-03	.15276E+00	.14003E+00	
58	.60000E+01	.19605E+05	.90714E+04	-.14003E+00	.55463E-03	-.64773E-01	-.17166E-02	.14003E+00	.64796E-01	
59	.60000E+01	.90714E+04	.93326E+04	.64773E-01	.17166E-02	-.66657E-01	-.76803E-03	.64796E-01	.66662E-01	
60	.60000E+01	.93326E+04	.10023E+05	.66657E-01	.76803E-03	-.71591E-01	-.71606E-03	.66662E-01	.71595E-01	

Cyc	Time	Time-Step	DW-RPM
1	.0001	.0001000	2.500
2	.0002	.0001000	2.500

3	.0003	.0001000	2.500
4	.0004	.0001000	2.500
5	.0005	.0001000	2.500
6	.0006	.0001000	2.500
7	.0007	.0001000	2.500
8	.0008	.0001000	2.500
9	.0009	.0001000	2.500
10	.0010	.0001000	2.500

OUTPUT AT TIME .0010

Displacements, Velocities, and Accelerations

	X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Vehicle	-.14513E+00	.24007E+02	.64221E-06	-.14497E+03	.14133E+02	.12400E-02	.30724E+03	.13041E+05	.11114E+01
Wheel 1	-.75031E+02	.21240E+02	.15708E-01	-.14436E+03	-.56546E+03	.15708E+02	.61013E+05	-.43152E+06	.00000E+00
Wheel 2	-.49848E+02	.14403E+02	.11396E-01	-.16502E+03	-.74658E+01	.11396E+02	-.36537E+04	.26094E+05	.00000E+00
Wheel 3	-.25140E+02	.14036E+02	.11396E-01	-.14567E+03	-.14161E+02	.11396E+02	-.30147E+03	-.37097E+04	.00000E+00
Wheel 4	-.12415E+00	.13945E+02	.11396E-01	-.14664E+03	-.11119E+02	.11396E+02	-.47789E+03	.23091E+04	.00000E+00
Wheel 5	.25622E+02	.13719E+02	.11396E-01	-.21014E+03	-.94219E+01	.11396E+02	-.58326E+05	.69492E+04	.00000E+00
Wheel 6	.49801E+02	.13643E+02	.11396E-01	-.14124E+03	-.75063E+01	.11396E+02	.52707E+04	.40800E+05	.00000E+00
Wheel 7	.74709E+02	.15762E+02	.15708E-01	-.14227E+03	-.56653E+03	.15708E+02	-.14305E+06	.72352E+04	.00000E+00
Link 1	-.28440E+00	.26702E+02	.31124E+01	-.28303E+03	-.21457E+01	-.65625E+00	.21937E+05	.72821E+02	-.79425E+03
Link 2	-.62124E+01	.26928E+02	.30954E+01	-.29602E+03	.25082E+01	-.43236E+00	-.17057E+05	-.69205E+04	-.80831E+03
Link 3	-.12163E+02	.27241E+02	.30826E+01	-.32778E+03	.59860E+01	-.12838E+00	-.10323E+06	-.27043E+04	.80180E+02
Link 4	-.18109E+02	.27594E+02	.30818E+01	-.43780E+03	.73019E+01	.92081E+00	-.23093E+06	.58539E+04	.12132E+04
Link 5	-.24167E+02	.27788E+02	.31362E+01	-.51877E+03	.16472E+02	.38853E+00	.10802E+06	.20090E+05	-.12766E+04
Link 6	-.30189E+02	.27876E+02	.31199E+01	-.43672E+03	.23850E+02	-.13512E+01	-.22225E+06	-.77415E+04	-.15189E+04
Link 7	-.36281E+02	.28224E+02	.30487E+01	-.32325E+03	.59484E+01	.21000E+01	-.10497E+06	-.77412E+04	.33486E+04
Link 8	-.42612E+02	.28561E+02	.31225E+01	-.29038E+03	.12142E+02	-.24729E+01	-.18627E+05	.62129E+05	-.38855E+04
Link 9	-.48546E+02	.28956E+02	.30369E+01	-.28766E+03	.61100E+01	.27094E+01	-.13103E+04	-.96689E+05	.33777E+04
Link 10	-.54681E+02	.29262E+02	.31403E+01	-.28995E+03	.10424E+02	-.37099E+01	.13052E+04	.88262E+05	-.17299E+04
Link 11	-.60810E+02	.29653E+02	.30195E+01	-.29186E+03	-.76567E+01	.46583E+01	.97413E+04	-.63247E+05	.28398E+04
Link 12	-.66935E+02	.29974E+02	-.31275E+01	-.27917E+03	.31976E+02	-.43339E+01	.36436E+05	.12050E+06	-.85583E+04
Link 13	-.72989E+02	.30663E+02	.29103E+01	-.24045E+03	-.37895E+02	.12615E+02	.12065E+06	-.36832E+06	.19625E+05
Link 14	-.78674E+02	.29901E+02	-.26723E+01	-.10997E+03	-.88030E+02	-.46120E+01	.23406E+06	.27698E+06	.75988E+04
Link 15	-.83104E+02	.26118E+02	-.21945E+01	-.15799E+03	-.95042E+02	.94401E+01	.11122E+06	-.17477E+06	.11026E+05
Link 16	-.84298E+02	.20673E+02	-.13968E+01	-.12151E+03	-.11795E+03	.95291E+01	.43932E+04	.14873E+06	.13585E+05
Link 17	-.81898E+02	.15350E+02	-.91029E+00	-.91500E+02	-.11379E+03	.13235E+02	-.36637E+06	-.32010E+06	.15601E+05
Link 18	-.77064E+02	.12395E+02	-.19957E+00	-.11757E+02	-.17342E+03	.51112E+01	-.11824E+06	-.33258E+06	.56350E+04
Link 19	-.71361E+02	.10554E+02	-.43058E+00	-.37828E+01	-.78928E+02	.18057E+01	.44434E+04	-.33644E+05	.65621E+04
Link 20	-.65826E+02	.81462E+01	-.39324E+00	-.47397E+01	-.67643E+02	-.78069E+00	.86318E+04	-.70717E+05	-.94458E+03
Link 21	-.60304E+02	.56761E+01	-.44388E+00	-.45556E+01	-.57594E+02	.39816E+00	.44266E+04	.11435E+06	.36719E+04
Link 22	-.55008E+02	.28074E+01	-.55886E+00	.32849E+01	.24360E+02	.13059E+02	-.18502E+05	.10901E+05	.20588E+05
Link 23	-.49413E+02	.11945E+01	-.24825E-01	.66134E+01	.61852E+02	.32098E+01	.21941E+05	-.13491E+06	.30965E+04
Link 24	-.43357E+02	.12468E+01	.54724E-01	.47626E+01	.56226E+02	-.54090E+01	.49748E+04	.10373E+06	-.86501E+04
Link 25	-.37302E+02	.12588E+01	-.50385E-01	.59116E+01	.31438E+02	.43957E+00	.55618E+04	-.16201E+05	-.39675E+03
Link 26	-.31244E+02	.12387E+01	.45988E-01	.57355E+01	.16413E+02	-.19647E+01	.52530E+04	.26124E+05	-.35945E+04
Link 27	-.25182E+02	.13013E+01	-.23407E-01	.49283E+01	.10750E+02	.61734E+00	.49579E+04	.59483E+03	.91652E+03
Link 28	-.19114E+02	.12439E+01	.21376E-02	.36637E+01	.16880E+02	.82106E+00	.29954E+04	-.30073E+04	.13552E+04
Link 29	-.13044E+02	.12443E+01	-.23655E-02	.17705E+01	.23147E+02	.15602E+00	.93975E+03	.92013E+04	.39516E+03
Link 30	-.69735E+01	.12480E+01	.34174E-02	-.10886E+01	.18624E+02	-.46261E+00	-.22491E+04	-.14978E+05	-.12293E+04
Link 31	-.90414E+00	.12415E+01	-.34364E-02	-.53864E+01	.13625E+02	.96512E-01	-.72054E+04	.86334E+04	.21268E+03
Link 32	.51635E+01	.12499E+01	.39231E-02	-.91020E+01	.18255E+02	.35395E+00	-.76432E+04	-.22473E+05	.99084E+03
Link 33	.11228E+02	.12607E+01	-.65574E-02	-.11234E+02	.28249E+02	.38936E+00	-.69641E+04	.32885E+05	.80904E+03
Link 34	.17290E+02	.12576E+01	.10717E-01	-.96815E+01	.24059E+02	.33809E+00	-.76615E+04	-.27066E+05	-.51989E+03
Link 35	.23349E+02	.12175E+01	-.22258E-01	-.63416E+01	.23192E+02	.70091E+00	-.10559E+05	.19912E+05	.12480E+04
Link 36	.29407E+02	.12678E+01	.36015E-01	.29702E+01	.24068E+02	-.13548E+01	-.45135E+04	-.54473E+05	-.12272E+04
Link 37	.35461E+02	.12213E+01	-.47829E-01	.56901E+01	.50595E+02	.13332E+01	.19723E+04	.16401E+06	.49568E+04
Link 38	.41511E+02	.13060E+01	.66245E-01	.30269E+01	.64920E+02	.15786E+01	-.25648E+04	-.82782E+05	.38927E+04
Link 39	.47544E+02	.11572E+01	-.11573E+00	-.11201E+02	.81335E+02	.43466E+01	-.36443E+05	.61065E+05	.23227E+04
Link 40	.53496E+02	.15042E+01	.23360E+00	-.93118E+01	.45094E+02	-.36392E+01	.42890E+05	-.15132E+06	-.81407E+04
Link 41	.59265E+02	.32744E+01	.37222E+00	-.12526E+01	.16492E+02	-.26578E+01	-.49907E+04	.15694E+06	-.31153E+04
Link 42	.65102E+02	.46837E+01	.91802E-01	.14541E+01	.47992E+02	.39875E+01	-.86086E+04	-.13870E+06	.50916E+04

Displacements, Velocities, and Accelerations

	X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Link 43	.70965E+02	.59619E+01	.34386E+00	-.60075E+01	.16225E+02	-.22239E+01	-.15242E+05	.36424E+05	-.66310E+04
Link 44	.76835E+02	.70301E+01	.17114E-01	-.16442E+02	.17620E+02	.18617E+02	.71664E+06	-.28305E+07	.36710E+05
Link 45	.81722E+02	.96008E+01	.89673E+00	-.11771E+03	.26677E+03	.20054E+02	-.69224E+05	-.27646E+06	.29881E+05
Link 46	.83827E+02	.15008E+02	.14894E+01	-.21742E+03	.19242E+03	.15284E+02	-.57331E+05	-.22151E+04	.25308E+05
Link 47	.82538E+02	.20713E+02	.20676E+01	-.35411E+03	-.34929E+02	.10784E+02	-.65408E+05	-.98621E+05	.29243E+05
Link 48	.78176E+02	.26458E+02	.27785E+01	-.34872E+03	-.12159E+03	.12100E+01	-.18271E+05	.45635E+05	-.58303E+03
Link 49	.72267E+02	.25153E+02	-.29981E+01	-.29870E+03	-.30643E+02	-.14674E+02	-.62997E+05	-.23625E+06	-.13619E+05
Link 50	.66175E+02	.25148E+02	.29901E+01	-.28075E+03	-.23664E+02	.86989E+01	-.13220E+05	.22495E+06	.35229E+04
Link 51	.60062E+02	.25348E+02	-.30389E+01	-.28433E+03	.66006E+02	-.90587E+01	.15098E+05	-.14447E+06	-.16915E+05
Link 52	.54005E+02	.25752E+02	.29024E+01	-.28612E+03	.81621E+01	.10734E+02	.10572E+05	-.64822E+05	.18220E+05
Link 53	.47947E+02	.26203E+02	-.30623E+01	-.28327E+03	.10870E+02	-.38470E+01	-.23801E+05	.28181E+06	-.90555E+04
Link 54	.41825E+02	.25622E+02	-.30123E+01	-.28711E+03	.62372E+02	-.84439E+01	.18307E+05	-.23313E+06	-.78860E+04
Link 55	.35727E+02	.25594E+02	.30074E+01	-.28216E+03	.10257E+02	.25699E+01	.37369E+05	.11328E+06	.15783E+05
Link 56	.29623E+02	.25808E+02	-.30790E+01	-.23592E+03	.61229E+01	-.85550E+01	.10835E+06	.10144E+06	-.75422E+04
Link 57	.23616E+02	.26359E+02	.29018E+01	-.14329E+03	-.10005E+02	.87857E+01	.20006E+06	-.57291E+05	-.58093E+03
Link 58	.17678E+02	.26969E+02	-.31057E+01	-.77511E+02	.48634E+01	.63260E+00	-.77722E+05	-.23271E+05	-.92182E+03
Link 59	.11629E+02	.26732E+02	-.30995E+01	-.15040E+03	.23930E+01	.19747E+00	.20858E+06	.10724E+05	.18145E+03
Link 60	.56549E+01	.26610E+02	.31403E+01	-.25039E+03	-.38636E+01	-.57034E+00	.96749E+05	-.22438E+04	-.16009E+03

Forces and Moments

	FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Vehicle	.79514E+04	.33749E+06	.14226E+06						
Wheel 1	.18914E+05	-.13377E+06	.00000E+00						
Wheel 2	-.62383E+03	.30269E+04	.00000E+00						
Wheel 3	-.34971E+02	-.43033E+03	.00000E+00						
Wheel 4	-.55435E+02	.26785E+03	.00000E+00						
Wheel 5	-.67658E+04	.80610E+03	.00000E+00						
Wheel 6	.61141E+03	.47328E+04	.00000E+00						
Wheel 7	-.44344E+05	.22429E+04	.00000E+00						
Link 1	.00000E+00	-.20093E+02	.00000E+00	-.83137E+04	-.15476E+02	.94544E+04	.39356E+02	.69492E+02	-.19738E+02
Link 2	.00000E+00	-.20093E+02	.00000E+00	-.94544E+04	-.39356E+02	.85674E+04	-.30042E+03	.19738E+02	-.36097E+01
Link 3	.00000E+00	-.20093E+02	.00000E+00	-.85674E+04	.30042E+03	.31993E+04	-.42095E+03	.36097E+01	.84594E+02
Link 4	.00000E+00	-.20093E+02	.00000E+00	-.31993E+04	.42095E+03	-.88091E+04	-.96451E+02	-.84594E+02	.78043E+02
Link 5	.00000E+00	-.20093E+02	.00000E+00	.88091E+04	.96451E+02	-.31921E+04	.96834E+03	-.78043E+02	-.17980E+03
Link 6	.00000E+00	-.20093E+02	.00000E+00	.31921E+04	-.96834E+03	-.14749E+05	.58588E+03	.17980E+03	.12660E+03
Link 7	.00000E+00	-.20093E+02	.00000E+00	.14749E+05	-.58588E+03	-.20207E+05	.20343E+03	-.12660E+03	-.21102E+03
Link 8	.00000E+00	-.20093E+02	.00000E+00	.20207E+05	-.20343E+03	-.21176E+05	.34543E+04	.21102E+03	.23475E+03
Link 9	.00000E+00	-.20093E+02	.00000E+00	.21176E+05	-.34543E+04	-.21244E+05	-.15535E+04	-.23475E+03	-.29670E+03
Link 10	.00000E+00	-.20093E+02	.00000E+00	.21244E+05	.15535E+04	-.21176E+05	.30562E+04	.29670E+03	.41815E+03
Link 11	.00000E+00	-.20093E+02	.00000E+00	.21176E+05	-.30562E+04	-.20669E+05	-.21253E+03	-.41815E+03	-.43504E+03
Link 12	.00000E+00	-.20093E+02	.00000E+00	.20669E+05	.21253E+03	-.18775E+05	.60735E+04	.43504E+03	.84527E+03
Link 13	.00000E+00	-.20093E+02	.00000E+00	.18775E+05	-.60735E+04	-.12501E+05	-.13059E+05	-.84527E+03	.15149E+03
Link 14	.00000E+00	-.20093E+02	.00000E+00	.12501E+05	.13059E+05	-.32976E+03	.13640E+04	-.15149E+03	.22268E+04
Link 15	.00000E+00	-.20093E+02	.00000E+00	.32976E+03	-.13640E+04	.54537E+04	-.77042E+04	-.22268E+04	.17941E+04
Link 16	.00000E+00	-.20093E+02	.00000E+00	-.54537E+04	.77042E+04	.56821E+04	.50080E+02	-.17941E+04	.13948E+04
Link 17	-.20735E+05	-.17807E+05	.00000E+00	-.56821E+04	-.50080E+02	.73655E+04	.12125E+04	-.13948E+04	.92343E+03
Link 18	-.38917E+04	-.16953E+05	.00000E+00	-.73655E+04	-.12125E+04	.51088E+04	.87140E+03	-.92343E+03	-.78952E+03
Link 19	.00000E+00	-.20093E+02	.00000E+00	-.51088E+04	-.87140E+03	.53398E+04	-.85800E+03	.78952E+03	-.12922E+03
Link 20	.00000E+00	-.20093E+02	.00000E+00	-.53398E+04	.85800E+03	.57887E+04	-.45152E+04	.12922E+03	-.16404E+02
Link 21	.00000E+00	-.20093E+02	.00000E+00	-.57887E+04	.45152E+04	.60189E+04	.14509E+04	.16404E+02	.78446E+03
Link 22	-.23661E+04	-.52925E+04	.00000E+00	-.60189E+04	-.14509E+04	.74029E+04	.73103E+04	-.78446E+03	.38563E+03
Link 23	.00000E+00	.55275E+04	.00000E+00	-.74029E+04	-.73103E+04	.85438E+04	-.52323E+04	-.38563E+03	-.53116E+03

Forces and Moments

		FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Link	24	.00000E+00	.30246E+03	.00000E+00	-.85438E+04	.52323E+04	.88025E+04	-.14100E+03	.53116E+03	.24591E+03
Link	25	.00000E+00	-.20093E+02	.00000E+00	-.88025E+04	.14100E+03	.90917E+04	-.96336E+03	-.24591E+03	.18000E+02
Link	26	.00000E+00	.11087E+04	.00000E+00	-.90917E+04	.96336E+03	.93648E+04	-.71362E+03	-.18000E+02	.40601E+02
Link	27	-.50260E+01	-.15768E+04	.00000E+00	-.93648E+04	.71362E+03	.96277E+04	.89410E+03	-.40601E+02	.90447E+02
Link	28	.00000E+00	.58994E+03	.00000E+00	-.96277E+04	-.89410E+03	.97834E+04	.14777E+03	-.90447E+02	-.64821E+02
Link	29	.00000E+00	.55276E+03	.00000E+00	-.97834E+04	-.14777E+03	.98323E+04	.73487E+02	.64821E+02	-.37962E+02
Link	30	.00000E+00	.18470E+03	.00000E+00	-.98323E+04	-.73487E+02	.97153E+04	-.89005E+03	.37962E+02	.30665E+02
Link	31	-.13741E+03	-.14117E+04	.00000E+00	-.97153E+04	.89005E+03	.94781E+04	.97063E+03	-.30665E+02	.37674E+02
Link	32	.00000E+00	-.13155E+02	.00000E+00	-.94781E+04	-.97063E+03	.90806E+04	-.18482E+03	-.37674E+02	-.20563E+02
Link	33	.00000E+00	.90912E+03	.00000E+00	-.90806E+04	.18482E+03	.87185E+04	.61609E+03	.20563E+02	.34475E+02
Link	34	.00000E+00	-.20093E+02	.00000E+00	-.87185E+04	-.61609E+03	.83201E+04	-.77127E+03	-.34475E+02	-.44002E+02
Link	35	-.77050E+03	-.10038E+04	.00000E+00	-.83201E+04	.77127E+03	.85415E+04	.12680E+04	.44002E+02	-.38659E+02
Link	36	.00000E+00	-.20093E+02	.00000E+00	-.85415E+04	-.12680E+04	.83068E+04	-.15445E+04	.38659E+02	.33622E+02
Link	37	.00000E+00	.28468E+04	.00000E+00	-.83068E+04	.15445E+04	.84094E+04	.41373E+04	-.33422E+02	.27572E+03
Link	38	.00000E+00	-.20093E+02	.00000E+00	-.84094E+04	-.41373E+04	.82760E+04	-.14729E+03	-.27572E+03	-.17980E+03
Link	39	-.10998E+04	.31780E+04	.00000E+00	-.82760E+04	.14729E+03	.74808E+04	-.14989E+03	.17980E+03	.12524E+03
Link	40	.17853E+04	-.58855E+04	.00000E+00	-.74808E+04	.14989E+03	.79258E+04	-.21329E+04	-.12524E+03	.39127E+03
Link	41	.00000E+00	-.20093E+02	.00000E+00	-.79258E+04	.21329E+04	.76663E+04	.60483E+04	-.39127E+03	-.81209E+02
Link	42	.00000E+00	-.20093E+02	.00000E+00	-.76663E+04	-.60483E+04	.72186E+04	-.11439E+04	.81209E+02	.53394E+02
Link	43	.00000E+00	-.20093E+02	.00000E+00	-.72186E+04	.11439E+04	.64260E+04	.77026E+03	-.53394E+02	.98334E+03
Link	44	.41632E+05	-.17098E+06	.00000E+00	-.64260E+04	-.77026E+03	.20598E+04	.24567E+05	-.98334E+03	.20886E+04
Link	45	.00000E+00	-.20093E+02	.00000E+00	-.20598E+04	-.24567E+05	-.15399E+04	.10211E+05	-.20886E+04	.93494E+03
Link	46	.99910E+04	-.84653E+03	.00000E+00	.15399E+04	-.10211E+05	-.14512E+05	.10942E+05	-.93494E+03	.92680E+03
Link	47	.00000E+00	-.20093E+02	.00000E+00	.14512E+05	-.10942E+05	-.17913E+05	.58343E+04	-.92680E+03	.80447E+03
Link	48	.00000E+00	-.20093E+02	.00000E+00	.17913E+05	-.58343E+04	-.18863E+05	.82274E+04	-.80447E+03	-.17244E+03
Link	49	.00000E+00	-.20093E+02	.00000E+00	.18863E+05	-.82274E+04	-.22139E+05	-.40374E+04	.17244E+03	.12629E+04
Link	50	.00000E+00	-.20093E+02	.00000E+00	.22139E+05	.40374E+04	-.22827E+05	.76799E+04	-.12629E+04	-.89218E+03
Link	51	.00000E+00	-.20093E+02	.00000E+00	.22827E+05	-.76799E+04	-.22042E+05	.18750E+03	.89218E+03	.86323E+03
Link	52	.00000E+00	-.20093E+02	.00000E+00	.22042E+05	-.18750E+03	-.21492E+05	-.31631E+04	-.86323E+03	-.48661E+03
Link	53	-.79242E+03	.53481E+04	.00000E+00	.21492E+05	.31631E+04	-.21937E+05	.61431E+04	.48661E+03	-.26650E+03
Link	54	.00000E+00	-.20093E+02	.00000E+00	.21937E+05	-.61431E+04	-.20985E+05	-.59596E+04	.26650E+03	.31626E+03
Link	55	.00000E+00	-.20093E+02	.00000E+00	.20985E+05	.59596E+04	-.19042E+05	-.49182E+02	-.31626E+03	-.47483E+03
Link	56	.51713E+03	.15422E+04	.00000E+00	.19042E+05	.49182E+02	-.13925E+05	.36834E+04	.47483E+03	.75003E+03
Link	57	.00000E+00	-.20093E+02	.00000E+00	.13925E+05	-.36834E+04	-.35217E+04	.72432E+03	-.75003E+03	-.53649E+02
Link	58	.00000E+00	-.20093E+02	.00000E+00	.35217E+04	-.72432E+03	-.75632E+04	-.46568E+03	.53649E+02	-.21846E+02
Link	59	.00000E+00	-.20093E+02	.00000E+00	.75632E+04	.46568E+03	.32827E+04	.11206E+03	.21846E+02	-.16034E+03
Link	60	.00000E+00	-.20093E+02	.00000E+00	-.32827E+04	-.11206E+03	.83137E+04	.15476E+02	.16034E+03	-.69492E+02

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2
1	.60000E+01	.83137E+04	.94545E+04	.59383E-01	.11055E-03	-.67532E-01	-.28111E-03	.59383E-01	.67532E-01
2	.60000E+01	.94545E+04	.85727E+04	.67532E-01	.28111E-03	-.61196E-01	.21458E-02	.67532E-01	.61234E-01
3	.60000E+01	.85727E+04	.32269E+04	.61196E-01	-.21458E-02	-.22852E-01	.30068E-02	.61234E-01	.23049E-01
4	.60000E+01	.32269E+04	.88097E+04	.22852E-01	-.30068E-02	.62922E-01	.68893E-03	.23049E-01	.62926E-01
5	.60000E+01	.88097E+04	.33357E+04	-.62922E-01	-.68893E-03	.22800E-01	-.69167E-02	.62926E-01	.23826E-01
6	.60000E+01	.33357E+04	.14761E+05	-.22800E-01	.69167E-02	.10535E+00	-.41848E-02	.23826E-01	.10543E+00
7	.60000E+01	.14761E+05	.20208E+05	-.10535E+00	.41848E-02	.14434E+00	-.14531E-02	.10543E+00	.14434E+00
8	.60000E+01	.20208E+05	.21456E+05	-.14434E+00	.14531E-02	.15126E+00	-.24673E-01	.14434E+00	.15325E+00
9	.60000E+01	.21456E+05	.21301E+05	-.15126E+00	.24673E-01	.15174E+00	.11096E-01	.15325E+00	.15215E+00
10	.60000E+01	.21301E+05	.21395E+05	-.15174E+00	-.11096E-01	.15126E+00	-.21830E-01	.15215E+00	.15282E+00
11	.60000E+01	.21395E+05	.20671E+05	-.15126E+00	.21830E-01	.14764E+00	.15181E-02	.15282E+00	.14765E+00
12	.60000E+01	.20671E+05	.19733E+05	-.14764E+00	-.15181E-02	.13411E+00	-.43382E-01	.14765E+00	.14095E+00

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2	
13	.60000E+01	.19733E+05	.18078E+05	-.13411E+00	.43382E-01	.89293E-01	.93279E-01	.14095E+00	.12913E+00	
14	.60000E+01	.18078E+05	.14033E+04	-.89293E-01	-.93279E-01	.23554E-02	-.97427E-02	.12913E+00	.10023E-01	
15	.60000E+01	.14033E+04	.94391E+04	-.23554E-02	.97427E-02	-.38955E-01	.55030E-01	.10023E-01	.67422E-01	
16	.60000E+01	.94391E+04	.56823E+04	.38955E-01	-.55030E-01	-.40587E-01	-.35771E-03	.67422E-01	.40588E-01	
17	.60000E+01	.56823E+04	.74646E+04	.40587E-01	.35771E-03	-.52611E-01	-.86604E-02	.40588E-01	.53319E-01	Wheel 1
18	.60000E+01	.74646E+04	.51825E+04	.52611E-01	.86604E-02	-.36491E-01	-.62243E-02	.53319E-01	.37018E-01	Wheel 1
19	.60000E+01	.51825E+04	.54083E+04	.36491E-01	.62243E-02	-.38142E-01	.61286E-02	.37018E-01	.38631E-01	
20	.60000E+01	.54083E+04	.73414E+04	.38142E-01	-.61286E-02	-.41348E-01	.32251E-01	.38631E-01	.52438E-01	
21	.60000E+01	.73414E+04	.61913E+04	.41348E-01	-.32251E-01	-.42992E-01	-.10364E-01	.52438E-01	.44223E-01	
22	.60000E+01	.61913E+04	.10404E+05	.42992E-01	.10364E-01	-.52878E-01	-.52217E-01	.44223E-01	.74314E-01	Wheel 2
23	.60000E+01	.10404E+05	.10019E+05	.52878E-01	.52217E-01	-.61027E-01	.37374E-01	.74314E-01	.71562E-01	Ground
24	.60000E+01	.10019E+05	.88036E+04	.61027E-01	-.37374E-01	-.62875E-01	.10072E-02	.71562E-01	.62883E-01	Ground
25	.60000E+01	.88036E+04	.91426E+04	.62875E-01	-.10072E-02	-.64941E-01	.68811E-02	.62883E-01	.65304E-01	
26	.60000E+01	.91426E+04	.93920E+04	.64941E-01	-.68811E-02	-.66892E-01	.50973E-02	.65304E-01	.67086E-01	Ground
27	.60000E+01	.93920E+04	.96691E+04	.66892E-01	-.50973E-02	-.68769E-01	-.63864E-02	.67086E-01	.69065E-01	Wheel 3
28	.60000E+01	.96691E+04	.97845E+04	.68769E-01	.63864E-02	-.69882E-01	-.10555E-02	.69065E-01	.69890E-01	Ground
29	.60000E+01	.97845E+04	.98326E+04	.69882E-01	.10555E-02	-.70231E-01	-.52491E-03	.69890E-01	.70233E-01	Ground
30	.60000E+01	.98326E+04	.97560E+04	.70231E-01	.52491E-03	-.69395E-01	.63575E-02	.70233E-01	.69686E-01	Ground
31	.60000E+01	.97560E+04	.95276E+04	.69395E-01	-.63575E-02	-.67700E-01	-.69331E-02	.69686E-01	.68055E-01	Ground and Wheel 4
32	.60000E+01	.95276E+04	.90825E+04	.67700E-01	.69331E-02	-.64862E-01	.13201E-02	.68055E-01	.64875E-01	Ground
33	.60000E+01	.90825E+04	.87402E+04	.64862E-01	-.13201E-02	-.62275E-01	-.44006E-02	.64875E-01	.62430E-01	Ground
34	.60000E+01	.87402E+04	.83558E+04	.62275E-01	.44006E-02	-.59429E-01	.55090E-02	.62430E-01	.59684E-01	
35	.60000E+01	.83558E+04	.86351E+04	.59429E-01	-.55090E-02	-.61011E-01	-.90569E-02	.59684E-01	.61680E-01	Ground and Wheel 5
36	.60000E+01	.86351E+04	.84492E+04	.61011E-01	.90569E-02	-.59335E-01	.11032E-01	.61680E-01	.60352E-01	
37	.60000E+01	.84492E+04	.93720E+04	.59335E-01	-.11032E-01	-.60067E-01	-.29552E-01	.60352E-01	.66943E-01	Ground
38	.60000E+01	.93720E+04	.82773E+04	.60067E-01	.29552E-01	-.59114E-01	.10521E-02	.66943E-01	.59124E-01	
39	.60000E+01	.82773E+04	.74823E+04	.59114E-01	-.10521E-02	-.53434E-01	.10706E-02	.59124E-01	.53445E-01	Ground and Wheel 6
40	.60000E+01	.74823E+04	.82078E+04	.53434E-01	-.10706E-02	-.56613E-01	.15235E-01	.53445E-01	.58627E-01	Wheel 6
41	.60000E+01	.82078E+04	.97649E+04	.56613E-01	-.15235E-01	-.54759E-01	-.43202E-01	.58627E-01	.69749E-01	
42	.60000E+01	.97649E+04	.73087E+04	.54759E-01	.43202E-01	-.51562E-01	.81706E-02	.69749E-01	.52205E-01	
43	.60000E+01	.73087E+04	.64720E+04	.51562E-01	-.81706E-02	-.45900E-01	-.55019E-02	.52205E-01	.46229E-01	
44	.60000E+01	.64720E+04	.24653E+05	.45900E-01	.55019E-02	-.14713E-01	-.17548E+00	.46229E-01	.17610E+00	Wheel 7
45	.60000E+01	.24653E+05	.10327E+05	.14713E-01	.17548E+00	.10999E-01	-.72937E-01	.17610E+00	.73761E-01	
46	.60000E+01	.10327E+05	.18175E+05	-.10999E-01	.72937E-01	.10366E+00	-.78161E-01	.73761E-01	.12982E+00	Wheel 7
47	.60000E+01	.18175E+05	.18839E+05	-.10366E+00	.78161E-01	.12795E+00	-.41673E-01	.12982E+00	.13457E+00	
48	.60000E+01	.18839E+05	.20580E+05	-.12795E+00	.41673E-01	.13474E+00	-.58767E-01	.13457E+00	.14700E+00	
49	.60000E+01	.20580E+05	.22504E+05	-.13474E+00	.58767E-01	.15814E+00	.28839E-01	.14700E+00	.16075E+00	
50	.60000E+01	.22504E+05	.24084E+05	-.15814E+00	-.28839E-01	.16305E+00	-.54857E-01	.16075E+00	.17203E+00	
51	.60000E+01	.24084E+05	.22042E+05	-.16305E+00	.54857E-01	.15744E+00	-.13393E-02	.17203E+00	.15745E+00	
52	.60000E+01	.22042E+05	.21723E+05	-.15744E+00	.13393E-02	.15351E+00	.22594E-01	.15745E+00	.15517E+00	
53	.60000E+01	.21723E+05	.22781E+05	-.15351E+00	-.22594E-01	.15669E+00	-.43879E-01	.15517E+00	.16272E+00	Wheel 6
54	.60000E+01	.22781E+05	.21815E+05	-.15669E+00	.43879E-01	.14989E+00	.42569E-01	.16272E+00	.15582E+00	
55	.60000E+01	.21815E+05	.19042E+05	-.14989E+00	-.42569E-01	.13601E+00	.35130E-03	.15582E+00	.13601E+00	
56	.60000E+01	.19042E+05	.14404E+05	-.13601E+00	-.35130E-03	.99461E-01	-.26310E-01	.13601E+00	.10288E+00	Wheel 5
57	.60000E+01	.14404E+05	.35954E+04	-.99461E-01	.26310E-01	.25155E-01	-.51737E-02	.10288E+00	.25681E-01	
58	.60000E+01	.35954E+04	.75775E+04	-.25155E-01	.51737E-02	.54023E-01	.33263E-02	.25681E-01	.54125E-01	
59	.60000E+01	.75775E+04	.32847E+04	-.54023E-01	-.33263E-02	-.23448E-01	-.80045E-03	.54125E-01	.23462E-01	
60	.60000E+01	.32847E+04	.83137E+04	.23448E-01	.80045E-03	-.59383E-01	-.11055E-03	.23462E-01	.59383E-01	

Cyc	Time	Time-Step	DW-RPM
11	.0011	.0001000	2.500
12	.0012	.0001000	2.500

13	.0013	.0001000	2.500
14	.0014	.0001000	2.500
15	.0015	.0001000	2.500
16	.0016	.0001000	2.500
17	.0017	.0001000	2.500
18	.0018	.0001000	2.500
19	.0019	.0001000	2.500
20	.0020	.0001000	2.500

OUTPUT AT TIME .0020

Displacements, Velocities, and Accelerations

		X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Vehicle		-.28993E+00	.24028E+02	.26618E-05	-.14460E+03	.26299E+02	.26825E-02	.51143E+03	.11214E+05	.77350E+00
Wheel	1	-.74982E+02	.20757E+02	.31416E-01	.19020E+03	-.42098E+03	.15708E+02	.77192E+05	-.47000E+05	.00000E+00
Wheel	2	-.50011E+02	.14417E+02	.22792E-01	-.15796E+03	.41239E+02	.11396E+02	.11616E+05	.57621E+05	.00000E+00
Wheel	3	-.25286E+02	.14023E+02	.22792E-01	-.14602E+03	-.88501E+01	.11396E+02	-.44410E+03	.12457E+05	.00000E+00
Wheel	4	-.27082E+00	.13939E+02	.22792E-01	-.14656E+03	.15019E+01	.11396E+02	.32294E+03	.18560E+05	.00000E+00
Wheel	5	.25387E+02	.13724E+02	.22792E-01	-.25675E+03	.27954E+02	.11396E+02	-.36821E+05	.53939E+05	.00000E+00
Wheel	6	.49663E+02	.13670E+02	.22792E-01	-.13194E+03	.67525E+02	.11396E+02	.14756E+05	.55539E+05	.00000E+00
Wheel	7	.74472E+02	.15273E+02	.31416E-01	-.32043E+03	-.46120E+03	.15708E+02	-.15584E+06	.88944E+05	.00000E+00
Link	1	-.54102E+00	.26700E+02	.31117E+01	-.22797E+03	-.11177E+01	-.63976E+00	.65474E+05	.11459E+04	.86307E+03
Link	2	-.65345E+01	.26929E+02	.30947E+01	-.35351E+03	.25809E+01	-.76726E+00	-.78036E+05	.76164E+04	.26924E+03
Link	3	-.12553E+02	.27248E+02	.30826E+01	-.47321E+03	.10368E+02	-.11301E+00	-.93957E+05	.99788E+04	-.29393E+03
Link	4	-.18605E+02	.27607E+02	.30829E+01	-.49079E+03	.16001E+02	.70137E+00	.79277E+05	.10726E+04	-.11848E+04
Link	5	-.24632E+02	.27806E+02	.31357E+01	-.45547E+03	.13442E+02	-.12633E+01	-.43937E+05	-.16233E+05	-.11007E+04
Link	6	-.30680E+02	.27894E+02	.31182E+01	-.48671E+03	.16798E+02	-.18161E+01	.72587E+05	.71058E+04	-.67199E+02
Link	7	-.36689E+02	.28237E+02	.30517E+01	-.47615E+03	.20880E+02	.29898E+01	-.11332E+06	.11720E+05	-.77690E+03
Link	8	-.42740E+02	.28582E+02	.31189E+01	-.38067E+03	.12873E+02	-.39022E+01	-.14604E+06	-.29156E+05	.52864E+03
Link	9	-.48843E+02	.28947E+02	.30612E+01	-.31394E+03	.49121E+01	.52651E+01	-.60356E+05	.58299E+05	.16023E+04
Link	10	-.54968E+02	.29284E+02	.31357E+01	-.28237E+03	.89800E+01	-.57213E+01	.15060E+05	-.45689E+05	-.29881E+04
Link	11	-.61083E+02	.29652E+02	.30250E+01	-.24455E+03	.16645E+02	.61427E+01	.88852E+05	.22288E+05	.25910E+04
Link	12	-.67164E+02	.29986E+02	-.31333E+01	-.16829E+03	-.42107E+02	-.45786E+01	.16147E+06	-.12320E+06	.60726E+04
Link	13	-.73140E+02	.30553E+02	.29310E+01	-.89694E+02	-.77234E+02	.24270E+02	.80171E+05	.17230E+06	.25629E+04
Link	14	-.78763E+02	.29854E+02	-.26732E+01	-.11606E+03	-.96377E+02	.47083E+00	-.90345E+05	-.20883E+06	-.58542E+03
Link	15	-.83211E+02	.25997E+02	-.21835E+01	-.10357E+03	-.95489E+02	.81846E+01	-.94234E+05	.96374E+05	-.14237E+05
Link	16	-.84482E+02	.20578E+02	-.13915E+01	-.26336E+03	-.11700E+03	-.78550E+01	-.63865E+05	-.86405E+05	-.37664E+05
Link	17	-.82179E+02	.15237E+02	-.89684E+00	-.63771E+02	-.11239E+03	.74060E+01	.78287E+06	-.95271E+06	-.17578E+05
Link	18	-.77076E+02	.11995E+02	-.19357E+00	-.11258E+02	-.24919E+03	.28576E+01	-.12562E+07	-.10039E+07	-.19765E+05
Link	19	-.71364E+02	.10360E+02	-.41715E+00	-.43637E+01	-.34494E+03	.29691E+02	-.58438E+04	-.27899E+06	.40814E+05
Link	20	-.65826E+02	.80533E+01	-.39175E+00	.89935E+00	-.11807E+03	.64183E+01	.13586E+04	-.98021E+05	.17532E+05
Link	21	-.60317E+02	.56460E+01	-.44069E+00	-.25976E+02	-.50826E+02	.49323E+01	-.27759E+05	-.12909E+06	.16264E+04
Link	22	-.55015E+02	.28002E+01	-.53756E+00	-.81326E+01	-.39817E+02	.24975E+02	.13006E+05	-.56686E+05	.27062E+04
Link	23	-.49392E+02	.12213E+01	-.19448E-01	.29059E+02	.31845E+02	.76715E+01	.12985E+05	.52295E+05	.59113E+04
Link	24	-.43345E+02	.13159E+01	.46160E-01	.20314E+02	.52715E+02	-.95319E+01	.22911E+05	-.65328E+05	.79195E+03
Link	25	-.37293E+02	.12919E+01	-.51012E-01	.13104E+02	.39162E+02	-.17184E+01	.11286E+05	.10535E+05	-.20172E+04
Link	26	-.31236E+02	.12591E+01	.41932E-01	.10409E+02	.17468E+02	-.57978E+01	.48928E+04	-.12627E+05	-.39402E+04
Link	27	-.25174E+02	.13067E+01	-.22730E-01	.90289E+01	-.24637E+01	.67923E+00	.31284E+04	-.21769E+05	-.32134E+03
Link	28	-.19109E+02	.12557E+01	.37713E-02	.55480E+01	.70827E+01	.22646E+01	.67443E+03	-.11363E+05	.12736E+04
Link	29	-.13042E+02	.12625E+01	-.21296E-02	.76499E+00	.11783E+02	.19258E+00	-.26831E+04	-.14791E+05	-.28268E+03
Link	30	-.69767E+01	.12587E+01	.20419E-02	-.52157E+01	.50304E+01	-.22872E+01	-.47366E+04	-.14619E+05	-.23274E+04
Link	31	-.91291E+00	.12463E+01	-.32578E-02	-.10747E+02	-.70099E+01	.24771E+00	-.25514E+04	-.23488E+05	.19272E+03
Link	32	.51513E+01	.12617E+01	.52714E-02	-.13833E+02	.79782E+01	.23917E+01	-.21416E+04	-.12239E+05	.25590E+04
Link	33	.11215E+02	.12650E+01	-.58131E-02	-.14778E+02	.13219E+02	.89398E+00	-.22746E+04	-.28929E+05	-.18452E+02
Link	34	.17277E+02	.12723E+01	.10128E-01	-.15395E+02	.73954E+01	-.18958E+01	-.41568E+04	-.22189E+05	-.39314E+04
Link	35	.23338E+02	.12259E+01	-.20993E-01	-.14329E+02	-.97249E+01	.17602E+01	-.41689E+04	-.29131E+05	.14047E+04
Link	36	.29404E+02	.12893E+01	.36072E-01	-.94576E+01	.28535E+02	.24833E+01	-.17377E+05	.72815E+04	.68352E+04
Link	37	.35462E+02	.12877E+01	-.43597E-01	-.70543E+01	.40401E+02	.60671E+01	-.27404E+05	-.93435E+05	.23172E+04
Link	38	.41505E+02	.13475E+01	.68089E-01	-.15333E+02	.32352E+02	-.33267E-01	-.19458E+05	-.20548E+05	-.82188E+04
Link	39	.47525E+02	.11953E+01	-.11199E+00	-.14475E+02	-.59733E+01	.24797E+01	.23259E+05	-.31698E+05	-.28845E+04
Link	40	.53495E+02	.15271E+01	.22630E+00	-.65362E+01	.41917E+02	-.84806E+01	-.38983E+05	.84999E+05	.13354E+04
Link	41	.59265E+02	.33175E+01	.36833E+00	.25532E+01	.85127E+01	-.52000E+01	.68329E+04	-.16337E+06	-.49859E+04
Link	42	.65100E+02	.46566E+01	.94276E-01	.33475E+01	-.94091E+02	-.41133E+01	.31889E+05	-.18407E+06	-.26452E+05

Displacements, Velocities, and Accelerations

	X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Link 43	.70997E+02	.57895E+01	.31944E+00	.80090E+02	-.40392E+03	-.53047E+02	.96164E+05	-.44377E+06	-.70943E+05
Link 44	.76938E+02	.66316E+01	.52106E-01	.10358E+03	-.29887E+03	.42541E+02	.61820E+06	-.18205E+07	.41300E+04
Link 45	.81672E+02	.95057E+01	.94437E+00	.39957E+02	-.38911E+03	.73483E+02	.13949E+06	-.35419E+06	.51061E+05
Link 46	.83607E+02	.15099E+02	.15175E+01	-.21306E+03	-.63395E+02	.36970E+02	-.29811E+05	-.43729E+06	.15098E+05
Link 47	.82187E+02	.20697E+02	.20962E+01	-.33715E+03	.11352E+02	.61399E+02	.23340E+05	.93491E+04	.21300E+05
Link 48	.77810E+02	.24361E+02	.27808E+01	-.39047E+03	-.93747E+02	.49953E+01	-.69879E+05	-.24905E+05	.89708E+04
Link 49	.71932E+02	.25061E+02	-.30211E+01	-.36210E+03	-.76500E+02	-.29747E+02	-.52679E+05	.13084E+06	-.12983E+05
Link 50	.65873E+02	.25178E+02	.29982E+01	-.32533E+03	.49568E+01	.66765E+01	-.58141E+05	-.15557E+06	-.32159E+04
Link 51	.59781E+02	.25340E+02	-.30551E+01	-.28446E+03	-.83266E+01	-.20044E+02	-.28059E+05	.79591E+05	-.55685E+04
Link 52	.53723E+02	.25764E+02	.29191E+01	-.28255E+03	.27565E+02	.18631E+02	-.38681E+04	.24348E+05	.50408E+03
Link 53	.47659E+02	.26242E+02	-.30699E+01	-.28239E+03	-.14661E+02	-.90972E+01	.25518E+05	-.16705E+06	-.49801E+03
Link 54	.41555E+02	.25624E+02	-.30218E+01	-.24776E+03	.20178E+02	-.87279E+01	.69965E+05	.13244E+06	.25861E+04
Link 55	.35491E+02	.25643E+02	.30173E+01	-.18168E+03	.51087E+02	.13606E+02	.13515E+06	-.39828E+05	.37644E+04
Link 56	.29461E+02	.25846E+02	-.30884E+01	-.10651E+03	.42196E+02	-.79729E+01	.94953E+05	-.14732E+05	.50780E+04
Link 57	.23523E+02	.26359E+02	.29101E+01	-.94302E+02	.26111E+02	.88598E+01	-.63212E+05	.62073E+05	.38811E+04
Link 58	.17560E+02	.26952E+02	-.31071E+01	-.12536E+03	-.28595E+02	-.32634E+01	.38187E+05	-.89726E+03	-.34848E+04
Link 59	.11532E+02	.26731E+02	-.30996E+01	-.97378E+02	-.10432E+02	-.66688E+00	-.63187E+05	-.26513E+05	-.21294E+04
Link 60	.54801E+01	.26608E+02	.31400E+01	-.11719E+03	-.18080E+01	.73897E-01	.87601E+05	-.14225E+04	.72516E+03

Forces and Moments

	FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Vehicle	.13236E+05	.29021E+06	.99008E+05						
Wheel 1	.23930E+05	-.14570E+05	.00000E+00						
Wheel 2	.13475E+04	.66840E+04	.00000E+00						
Wheel 3	-.51516E+02	.14451E+04	.00000E+00						
Wheel 4	.37461E+02	.21529E+04	.00000E+00						
Wheel 5	-.42712E+04	.62570E+04	.00000E+00						
Wheel 6	.17117E+04	.64425E+04	.00000E+00						
Wheel 7	-.48309E+05	.27573E+05	.00000E+00						
Link 1	.00000E+00	-.20093E+02	.00000E+00	.31443E+04	.28655E+03	.26040E+03	-.20687E+03	.12231E+03	-.48478E+02
Link 2	.00000E+00	-.20093E+02	.00000E+00	-.26040E+03	.20687E+03	-.37975E+04	.20927E+03	.48478E+02	.26653E+02
Link 3	.00000E+00	-.20093E+02	.00000E+00	.37975E+04	-.20927E+03	-.86832E+04	.74826E+03	-.26653E+02	.67718E+02
Link 4	.00000E+00	-.20093E+02	.00000E+00	.86832E+04	-.74826E+03	-.45609E+04	.82413E+03	-.67718E+02	-.43402E+02
Link 5	.00000E+00	-.20093E+02	.00000E+00	.45609E+04	-.82413E+03	-.68456E+04	.10558E+00	.43402E+02	-.84698E+02
Link 6	.00000E+00	-.20093E+02	.00000E+00	.68456E+04	-.10558E+00	-.30711E+04	.38970E+03	.84698E+02	.24661E+03
Link 7	.00000E+00	-.20093E+02	.00000E+00	.30711E+04	-.38970E+03	-.89635E+04	.10192E+04	-.24661E+03	-.41674E+03
Link 8	.00000E+00	-.20093E+02	.00000E+00	.89635E+04	-.10192E+04	-.16558E+05	.47680E+03	.41674E+03	.58053E+03
Link 9	.00000E+00	-.20093E+02	.00000E+00	.16558E+05	.47680E+03	-.19696E+05	.25748E+04	-.58053E+03	-.69260E+03
Link 10	.00000E+00	-.20093E+02	.00000E+00	.19696E+05	-.25748E+04	-.18913E+05	.21908E+03	.69260E+03	.72847E+03
Link 11	.00000E+00	-.20093E+02	.00000E+00	.18913E+05	-.21908E+03	-.14293E+05	.13982E+04	-.72847E+03	-.60257E+03
Link 12	.00000E+00	-.20093E+02	.00000E+00	.14293E+05	-.13982E+04	-.58964E+04	.49880E+04	.60257E+03	.18839E+04
Link 13	.00000E+00	-.20093E+02	.00000E+00	.58964E+04	.49880E+04	-.17275E+04	.39920E+04	-.18839E+04	-.43778E+03
Link 14	.00000E+00	-.20093E+02	.00000E+00	.17275E+04	-.39920E+04	-.64255E+04	.68471E+04	.43778E+03	.17318E+04
Link 15	.00000E+00	-.20093E+02	.00000E+00	.64255E+04	.68471E+04	-.11326E+05	.18155E+04	-.17318E+04	.45404E+03
Link 16	.00000E+00	-.20093E+02	.00000E+00	.11326E+05	.18155E+04	-.14647E+05	.62885E+04	-.45404E+03	.23640E+04
Link 17	-.14220E+05	-.10925E+05	.00000E+00	.14647E+05	.62885E+04	.40283E+05	-.44904E+05	-.23640E+04	.12010E+04
Link 18	-.28475E+05	-.11917E+06	.00000E+00	-.40283E+05	.44904E+05	.34359E+04	.22063E+05	-.12010E+04	.17077E+04
Link 19	.00000E+00	-.20093E+02	.00000E+00	-.34359E+04	-.22063E+05	.31320E+04	.75759E+04	-.17077E+04	-.18585E+04
Link 20	.00000E+00	-.20093E+02	.00000E+00	-.31320E+04	-.75759E+04	.32027E+04	.24989E+04	.18585E+04	-.23193E+03
Link 21	.00000E+00	-.20093E+02	.00000E+00	-.32027E+04	-.24989E+04	.17592E+04	-.41938E+04	.23193E+03	.14326E+04
Link 22	-.40023E+04	-.93124E+04	.00000E+00	-.17592E+04	.61938E+04	.66378E+04	.21709E+04	-.14326E+04	-.26354E+03
Link 23	.00000E+00	.28509E+04	.00000E+00	-.66378E+04	-.21709E+04	.71131E+04	.20394E+04	.26354E+03	-.12689E+04

Forces and Moments

		FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Link	24	.00000E+00	-.20093E+02	.00000E+00	-.71131E+04	-.20394E+04	.83045E+04	-.13376E+04	.12689E+04	.42540E+03
Link	25	.00000E+00	-.20093E+02	.00000E+00	-.83045E+04	.13376E+04	.88913E+04	-.76969E+03	-.42540E+03	-.12755E+03
Link	26	.00000E+00	-.20093E+02	.00000E+00	-.88913E+04	.76969E+03	.91458E+04	-.14062E+04	.12755E+03	.38824E+03
Link	27	.29495E+02	-.33667E+04	.00000E+00	-.91458E+04	.14062E+04	.92789E+04	.82849E+03	-.38824E+03	.18986E+03
Link	28	.00000E+00	-.20093E+02	.00000E+00	-.92789E+04	-.82849E+03	.93140E+04	.25772E+03	-.18986E+03	-.18375E+03
Link	29	.00000E+00	-.20093E+02	.00000E+00	-.93140E+04	-.25772E+03	.91745E+04	-.49130E+03	.18375E+03	-.19475E+03
Link	30	.00000E+00	-.20093E+02	.00000E+00	-.91745E+04	.49130E+03	.89282E+04	-.12314E+04	.19475E+03	.19676E+03
Link	31	-.20810E+03	-.37611E+04	.00000E+00	-.89282E+04	.12314E+04	.90036E+04	-.13083E+04	-.19676E+03	.19556E+03
Link	32	.00000E+00	-.20093E+02	.00000E+00	-.90036E+04	-.13083E+04	.88923E+04	-.69194E+03	-.19556E+03	-.14809E+03
Link	33	.00000E+00	-.20093E+02	.00000E+00	-.88923E+04	-.69194E+03	.87740E+04	-.79228E+03	.14809E+03	-.19390E+03
Link	34	.00000E+00	-.20093E+02	.00000E+00	-.87740E+04	.79228E+03	.85578E+04	-.19260E+04	.19390E+03	.23118E+03
Link	35	-.13722E+04	-.59814E+04	.00000E+00	-.85578E+04	.19260E+04	.97133E+04	.25406E+04	-.23118E+03	.18734E+03
Link	36	.00000E+00	-.20093E+02	.00000E+00	-.97133E+04	-.25406E+04	.88097E+04	.29393E+04	-.18734E+03	.11650E+03
Link	37	.00000E+00	-.20093E+02	.00000E+00	-.88097E+04	-.29393E+04	.73847E+04	-.18992E+04	-.11650E+03	-.25190E+03
Link	38	.00000E+00	-.20093E+02	.00000E+00	-.73847E+04	.18992E+04	.63729E+04	-.29476E+04	.25190E+03	-.19655E+03
Link	39	-.15766E+04	-.37473E+04	.00000E+00	-.63729E+04	.29476E+04	.91589E+04	-.84856E+03	.19655E+03	-.14429E+03
Link	40	.50505E+03	-.16205E+04	.00000E+00	-.91589E+04	.84856E+03	.66268E+04	.51919E+04	.14429E+03	.58815E+03
Link	41	.00000E+00	-.20093E+02	.00000E+00	-.66268E+04	-.51919E+04	.69821E+04	-.32831E+04	-.58815E+03	-.52445E+03
Link	42	.00000E+00	-.20093E+02	.00000E+00	-.69821E+04	.32831E+04	.86403E+04	-.12835E+05	.52445E+03	-.35230E+04
Link	43	.00000E+00	-.20093E+02	.00000E+00	-.86403E+04	.12835E+05	.13641E+05	-.35890E+05	.35230E+04	.72684E+04
Link	44	.48755E+05	-.17081E+06	.00000E+00	-.13641E+05	.35890E+05	-.29679E+04	.40251E+05	-.72684E+04	.45452E+04
Link	45	.19460E+04	-.15787E+04	.00000E+00	.29679E+04	-.40251E+05	.23397E+04	.23411E+05	-.45452E+04	-.17212E+04
Link	46	.11288E+05	-.23463E+03	.00000E+00	-.23397E+04	-.23411E+05	-.10498E+05	.90694E+03	.17212E+04	.16607E+04
Link	47	.00000E+00	-.20093E+02	.00000E+00	.10498E+05	-.90694E+03	-.92845E+04	.14132E+04	-.16607E+04	-.14625E+04
Link	48	.00000E+00	-.20093E+02	.00000E+00	.92845E+04	-.14132E+04	-.12918E+05	.13821E+03	.14625E+04	-.17813E+04
Link	49	.00000E+00	-.20093E+02	.00000E+00	.12918E+05	-.13821E+03	-.15658E+05	.69621E+04	.17813E+04	.24066E+04
Link	50	.00000E+00	-.20093E+02	.00000E+00	.15658E+05	-.69621E+04	-.18681E+05	-.11076E+04	-.24066E+04	-.16843E+04
Link	51	.00000E+00	-.20093E+02	.00000E+00	.18681E+05	.11076E+04	-.20140E+05	.30513E+04	.16843E+04	.24911E+04
Link	52	.00000E+00	-.20093E+02	.00000E+00	.20140E+05	-.30513E+04	-.20341E+05	.43375E+04	-.24911E+04	-.16232E+04
Link	53	-.29915E+03	.18563E+04	.00000E+00	.20341E+05	-.43375E+04	-.18715E+05	-.62055E+04	.16232E+04	.13807E+03
Link	54	.00000E+00	-.20093E+02	.00000E+00	.18715E+05	.62055E+04	-.15078E+05	.70155E+03	-.13807E+03	.12913E+04
Link	55	.00000E+00	-.20093E+02	.00000E+00	.15078E+05	-.70155E+03	-.80501E+04	-.13494E+04	-.12913E+04	-.13783E+04
Link	56	.00000E+00	-.20093E+02	.00000E+00	.80501E+04	.13494E+04	-.31125E+04	-.20954E+04	.13783E+04	.74762E+03
Link	57	.00000E+00	-.20093E+02	.00000E+00	.31125E+04	.20954E+04	-.63996E+04	.11525E+04	-.74762E+03	-.40195E+03
Link	58	.00000E+00	-.20093E+02	.00000E+00	.63996E+04	-.11525E+04	-.44138E+04	.11259E+04	.40195E+03	.23055E+03
Link	59	.00000E+00	-.20093E+02	.00000E+00	.44138E+04	-.11259E+04	-.76995E+04	-.23267E+03	-.23055E+03	-.36688E+02
Link	60	.00000E+00	-.20093E+02	.00000E+00	.76995E+04	.23267E+03	-.31443E+04	-.28655E+03	.36688E+02	-.12231E+03

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2
1	.60000E+01	.31573E+04	.33257E+03	-.22459E-01	-.20468E-02	-.18600E-02	.14776E-02	.22552E-01	.23755E-02
2	.60000E+01	.33257E+03	.38032E+04	.18600E-02	-.14776E-02	.27125E-01	-.14948E-02	.23755E-02	.27166E-01
3	.60000E+01	.38032E+04	.87154E+04	-.27125E-01	.14948E-02	.62023E-01	-.53447E-02	.27166E-01	.62253E-01
4	.60000E+01	.87154E+04	.46347E+04	-.62023E-01	.53447E-02	.32578E-01	-.58867E-02	.62253E-01	.33105E-01
5	.60000E+01	.46347E+04	.68456E+04	-.32578E-01	.58867E-02	.48897E-01	-.75415E-06	.33105E-01	.48897E-01
6	.60000E+01	.68456E+04	.30957E+04	-.48897E-01	.75415E-06	.21936E-01	-.27836E-02	.48897E-01	.22112E-01
7	.60000E+01	.30957E+04	.90213E+04	-.21936E-01	.27836E-02	.64025E-01	-.72803E-02	.22112E-01	.64438E-01
8	.60000E+01	.90213E+04	.16565E+05	-.64025E-01	.72803E-02	.11827E+00	.34057E-02	.64438E-01	.11832E+00
9	.60000E+01	.16565E+05	.19864E+05	-.11827E+00	-.34057E-02	.14069E+00	-.18392E-01	.11832E+00	.14188E+00
10	.60000E+01	.19864E+05	.18914E+05	-.14069E+00	.18392E-01	.13509E+00	-.15649E-02	.14188E+00	.13510E+00
11	.60000E+01	.18914E+05	.14361E+05	-.13509E+00	.15649E-02	.10209E+00	-.99869E-02	.13510E+00	.10258E+00
12	.60000E+01	.14361E+05	.77232E+04	-.10209E+00	.99869E-02	.42117E-01	.35628E-01	.10258E+00	.55165E-01

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2	
13	.60000E+01	.77232E+04	.43497E+04	-.42117E-01	-.35628E-01	.12339E-01	-.28514E-01	.55165E-01	.31069E-01	
14	.60000E+01	.43497E+04	.93898E+04	-.12339E-01	.28514E-01	.45896E-01	.48908E-01	.31069E-01	.67070E-01	
15	.60000E+01	.93898E+04	.11470E+05	-.45896E-01	-.48908E-01	.80897E-01	.12968E-01	.67070E-01	.81930E-01	
16	.60000E+01	.11470E+05	.15939E+05	-.80897E-01	-.12968E-01	.10462E+00	.44918E-01	.81930E-01	.11385E+00	
17	.60000E+01	.15939E+05	.60325E+05	-.10462E+00	-.44918E-01	-.28774E+00	.32074E+00	.11385E+00	.43089E+00	Wheel 1
18	.60000E+01	.60325E+05	.22329E+05	.28774E+00	-.32074E+00	-.24542E-01	-.15759E+00	.43089E+00	.15949E+00	Wheel 1
19	.60000E+01	.22329E+05	.81978E+04	.24542E-01	.15759E+00	-.22372E-01	-.54114E-01	.15949E+00	.58556E-01	
20	.60000E+01	.81978E+04	.40622E+04	.22372E-01	.54114E-01	-.22876E-01	-.17849E-01	.58556E-01	.29016E-01	
21	.60000E+01	.40622E+04	.45478E+04	.22876E-01	.17849E-01	-.12566E-01	.29956E-01	.29016E-01	.32485E-01	
22	.60000E+01	.45478E+04	.67940E+04	.12566E-01	-.29956E-01	-.45985E-01	-.15507E-01	.32485E-01	.48529E-01	Wheel 2
23	.60000E+01	.67940E+04	.73997E+04	.45985E-01	.15507E-01	-.50808E-01	-.14567E-01	.48529E-01	.52855E-01	Ground
24	.60000E+01	.73997E+04	.84115E+04	.50808E-01	.14567E-01	-.59318E-01	.95542E-02	.52855E-01	.60082E-01	
25	.60000E+01	.84115E+04	.89246E+04	.59318E-01	-.95542E-02	-.63510E-01	.54978E-02	.60082E-01	.63747E-01	
26	.60000E+01	.89246E+04	.92532E+04	.63510E-01	-.54978E-02	-.65327E-01	.10044E-01	.63747E-01	.66095E-01	
27	.60000E+01	.92532E+04	.93159E+04	.65327E-01	-.10044E-01	-.66278E-01	-.59178E-02	.66095E-01	.66542E-01	Wheel 3
28	.60000E+01	.93159E+04	.93176E+04	.66278E-01	.59178E-02	-.66529E-01	-.18408E-02	.66542E-01	.66554E-01	
29	.60000E+01	.93176E+04	.91876E+04	.66529E-01	.18408E-02	-.65532E-01	.35093E-02	.66554E-01	.65626E-01	
30	.60000E+01	.91876E+04	.90127E+04	.65532E-01	-.35093E-02	-.63773E-01	.87957E-02	.65626E-01	.64377E-01	
31	.60000E+01	.90127E+04	.90982E+04	.63773E-01	-.87957E-02	-.64312E-01	-.93448E-02	.64377E-01	.64987E-01	Ground and Wheel 4
32	.60000E+01	.90982E+04	.89191E+04	.64312E-01	.93448E-02	-.63516E-01	-.69424E-02	.64987E-01	.63708E-01	
33	.60000E+01	.89191E+04	.88097E+04	.63516E-01	.69424E-02	-.62671E-01	.56592E-02	.63708E-01	.62926E-01	
34	.60000E+01	.88097E+04	.87719E+04	.62671E-01	-.56592E-02	-.61127E-01	.13757E-01	.62926E-01	.62656E-01	
35	.60000E+01	.87719E+04	.10040E+05	.61127E-01	-.13757E-01	-.69381E-01	-.18147E-01	.62656E-01	.71714E-01	Ground and Wheel 5
36	.60000E+01	.10040E+05	.92871E+04	.69381E-01	.18147E-01	-.62926E-01	.20995E-01	.71714E-01	.66336E-01	
37	.60000E+01	.92871E+04	.76250E+04	.62926E-01	.20995E-01	-.52748E-01	.13566E-01	.66336E-01	.54464E-01	
38	.60000E+01	.76250E+04	.70215E+04	.52748E-01	-.13566E-01	-.45520E-01	.21054E-01	.54464E-01	.50154E-01	
39	.60000E+01	.70215E+04	.91982E+04	.45520E-01	-.21054E-01	-.65421E-01	.60612E-02	.50154E-01	.65701E-01	Ground and Wheel 6
40	.60000E+01	.91982E+04	.84184E+04	.65421E-01	-.60612E-02	-.47334E-01	-.37085E-01	.65701E-01	.60132E-01	Wheel 6
41	.60000E+01	.84184E+04	.77155E+04	.47334E-01	.37085E-01	-.49872E-01	.23451E-01	.60132E-01	.55110E-01	
42	.60000E+01	.77155E+04	.15472E+05	.49872E-01	-.23451E-01	-.61716E-01	.91675E-01	.55110E-01	.11051E+00	
43	.60000E+01	.15472E+05	.38395E+05	.61716E-01	-.91675E-01	-.97434E-01	.25636E+00	.11051E+00	.27425E+00	
44	.60000E+01	.38395E+05	.40360E+05	.97434E-01	-.25636E+00	.21199E-01	-.28751E+00	.27425E+00	.28829E+00	Wheel 7
45	.60000E+01	.40360E+05	.23528E+05	-.21199E-01	.28751E+00	-.16712E-01	-.16722E+00	.28829E+00	.16806E+00	Wheel 7
46	.60000E+01	.23528E+05	.10537E+05	.16712E-01	.16722E+00	.74987E-01	-.64782E-02	.16806E+00	.75267E-01	Wheel 7
47	.60000E+01	.10537E+05	.93915E+04	-.74987E-01	.64782E-02	.66318E-01	-.10094E-01	.75267E-01	.67082E-01	
48	.60000E+01	.93915E+04	.12919E+05	-.66318E-01	.10094E-01	.92273E-01	-.98720E-03	.67082E-01	.92278E-01	
49	.60000E+01	.12919E+05	.17136E+05	-.92273E-01	.98720E-03	.11184E+00	-.49729E-01	.92278E-01	.12240E+00	
50	.60000E+01	.17136E+05	.18714E+05	-.11184E+00	.49729E-01	.13343E+00	.79113E-02	.12240E+00	.13367E+00	
51	.60000E+01	.18714E+05	.20370E+05	-.13343E+00	-.79113E-02	.14386E+00	-.21795E-01	.13367E+00	.14550E+00	
52	.60000E+01	.20370E+05	.20798E+05	-.14386E+00	.21795E-01	.14529E+00	-.30982E-01	.14550E+00	.14856E+00	
53	.60000E+01	.20798E+05	.19717E+05	-.14529E+00	.30982E-01	.13368E+00	.44325E-01	.14856E+00	.14084E+00	Wheel 6
54	.60000E+01	.19717E+05	.15094E+05	-.13368E+00	-.44325E-01	.10770E+00	-.50111E-02	.14084E+00	.10782E+00	
55	.60000E+01	.15094E+05	.81624E+04	-.10770E+00	.50111E-02	.57501E-01	.96386E-02	.10782E+00	.58303E-01	
56	.60000E+01	.81624E+04	.37521E+04	-.57501E-01	-.96386E-02	.22232E-01	.14967E-01	.58303E-01	.26801E-01	
57	.60000E+01	.37521E+04	.65025E+04	-.22232E-01	-.14967E-01	.45711E-01	-.82320E-02	.26801E-01	.46446E-01	
58	.60000E+01	.65025E+04	.45552E+04	-.45711E-01	.82320E-02	.31527E-01	-.80422E-02	.46446E-01	.32537E-01	
59	.60000E+01	.45552E+04	.77030E+04	-.31527E-01	.80422E-02	.54997E-01	.16620E-02	.32537E-01	.55022E-01	
60	.60000E+01	.77030E+04	.31573E+04	-.54997E-01	-.16620E-02	.22459E-01	.20468E-02	.55022E-01	.22552E-01	

Cyc	Time	Time-Step	DW-RPM
21	.0021	.0001000	2.500
22	.0022	.0001000	2.500

23	.0023	.0001000	2.500
24	.0024	.0001000	2.500
25	.0025	.0001000	2.500
26	.0026	.0001000	2.500
27	.0027	.0001000	2.500
28	.0028	.0001000	2.500
29	.0029	.0001000	2.500
30	.0030	.0001000	2.500

OUTPUT AT TIME .0030

Displacements, Velocities, and Accelerations

	X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Vehicle	-.43624E+00	.24059E+02	.54720E-05	-.14397E+03	.36751E+02	.23567E-02	.78370E+03	.94920E+04	-.29147E+01
Wheel 1	-.74734E+02	.20380E+02	.47124E-01	.29592E+03	-.34171E+03	.15708E+02	.23658E+05	.90127E+04	.00000E+00
Wheel 2	-.50165E+02	.14483E+02	.34188E-01	-.15196E+03	.85133E+02	.11396E+02	-.31623E+04	.21429E+05	.00000E+00
Wheel 3	-.25432E+02	.14020E+02	.34188E-01	-.14647E+03	.14353E+01	.11396E+02	-.34624E+03	.36543E+04	.00000E+00
Wheel 4	-.41730E+00	.13948E+02	.34188E-01	-.14649E+03	.15778E+02	.11396E+02	-.29096E+03	.65216E+04	.00000E+00
Wheel 5	.25113E+02	.13777E+02	.34188E-01	-.28868E+03	.73327E+02	.11396E+02	-.26681E+05	.15612E+05	.00000E+00
Wheel 6	.49538E+02	.13736E+02	.34188E-01	-.12065E+03	.36940E+02	.11396E+02	.54451E+04	-.89654E+05	.00000E+00
Wheel 7	.74099E+02	.14812E+02	.47124E-01	-.39557E+03	-.50718E+03	.15708E+02	-.11504E+05	-.11749E+06	.00000E+00
Link 1	-.76235E+00	.26700E+02	.31115E+01	-.26186E+03	.11169E+01	.14005E+00	-.89837E+05	.30998E+04	.27077E+02
Link 2	-.69035E+01	.26937E+02	.30942E+01	-.35455E+03	.10529E+02	-.18298E+00	.81698E+05	.23983E+04	.51817E+03
Link 3	-.13010E+02	.27262E+02	.30823E+01	-.40755E+03	.13579E+02	-.30078E+00	.15019E+06	-.66724E+04	.41177E+03
Link 4	-.19060E+02	.27618E+02	.30832E+01	-.43877E+03	.65286E+01	.31830E+00	.19784E+05	-.93837E+04	.68336E+03
Link 5	-.25107E+02	.27816E+02	.31341E+01	-.47236E+03	.95733E+01	-.17032E+01	.43309E+05	.66383E+04	-.30745E+03
Link 6	-.31142E+02	.27917E+02	.31162E+01	-.46101E+03	.23817E+02	-.20957E+01	-.25899E+05	-.33710E+04	-.14266E+03
Link 7	-.37176E+02	.28255E+02	.30545E+01	-.47052E+03	.13263E+02	.30466E+01	.56284E+05	-.65240E+04	.84031E+03
Link 8	-.43188E+02	.28594E+02	.31151E+01	-.47911E+03	.20678E+02	-.38301E+01	-.94293E+04	.24610E+05	-.66416E+03
Link 9	-.49202E+02	.28965E+02	.30469E+01	-.39632E+03	.13589E+02	.57120E+01	-.60813E+05	-.30287E+05	-.28719E+03
Link 10	-.55240E+02	.29284E+02	.31289E+01	-.26287E+03	.27361E+01	-.69227E+01	.16791E+05	.10523E+05	.15282E+04
Link 11	-.61267E+02	.29648E+02	.30333E+01	-.13837E+03	-.26248E+02	.98363E+01	.73176E+05	-.26474E+05	.18983E+04
Link 12	-.67267E+02	.29946E+02	-.31356E+01	-.78831E+02	-.63855E+01	-.19509E+01	-.12841E+05	.87524E+05	-.20616E+04
Link 13	-.73237E+02	.30509E+02	.29548E+01	-.12336E+03	-.67388E+02	.23666E+02	-.69677E+05	-.11672E+06	.42923E+03
Link 14	-.78913E+02	.29698E+02	-.26752E+01	-.16319E+03	-.15780E+03	-.44075E+01	.17634E+04	.56273E+05	-.47410E+04
Link 15	-.83368E+02	.25899E+02	-.21845E+01	-.14889E+03	-.13571E+03	-.59320E+01	.15802E+06	-.11168E+06	-.16129E+04
Link 16	-.86597E+02	.20447E+02	-.14076E+01	.44105E+02	-.11818E+03	-.12967E+02	.28146E+06	.55451E+05	.23453E+05
Link 17	-.82120E+02	.15125E+02	-.89609E+00	.37634E+02	-.11105E+03	-.35940E+01	.15456E+05	-.13878E+07	-.75962E+04
Link 18	-.77086E+02	.11684E+02	-.21555E+00	-.10717E+02	-.23500E+03	-.49528E+02	-.12765E+07	-.93545E+06	-.69282E+05
Link 19	-.71379E+02	.99859E+01	-.37085E+00	-.27967E+02	-.36211E+03	.54840E+02	-.36578E+05	.53956E+05	.64445E+04
Link 20	-.65823E+02	.78524E+01	-.37449E+00	.76686E+01	-.26293E+03	.24280E+02	.17200E+05	-.89729E+05	.89102E+04
Link 21	-.60338E+02	.55055E+01	-.43619E+00	-.56871E+00	-.20267E+03	.40418E+01	.70984E+05	-.90573E+05	-.14815E+03
Link 22	-.55005E+02	.27514E+01	-.51253E+00	.28650E+02	-.56854E+02	.25228E+02	.48198E+05	-.33705E+05	.18380E+04
Link 23	-.49356E+02	.12640E+01	-.90772E-02	.44904E+02	.37301E+02	.11878E+02	.27518E+05	-.25212E+05	.20153E+04
Link 24	-.43314E+02	.13530E+01	.38147E-01	.38188E+02	.40207E+02	-.65947E+01	.13055E+05	.26262E+05	.27977E+04
Link 25	-.37271E+02	.13217E+01	-.52495E-01	.29690E+02	.16031E+02	-.47639E+00	.17280E+05	-.30420E+05	.31568E+04
Link 26	-.31222E+02	.12673E+01	.34173E-01	.19144E+02	-.84981E+00	-.89737E+01	.12565E+05	-.21958E+05	-.16329E+04
Link 27	-.25166E+02	.12956E+01	-.22258E-01	.11499E+02	-.16440E+02	.37458E+00	.32038E+04	-.90329E+04	.37781E+02
Link 28	-.19104E+02	.12544E+01	.66215E-02	.44617E+01	-.86167E+01	.32560E+01	-.18058E+04	-.15041E+05	.77078E+03
Link 29	-.13043E+02	.12681E+01	-.21837E-02	-.22979E+01	.15536E+01	-.26601E+00	-.21553E+04	-.79612E+04	-.38634E+03
Link 30	-.69836E+01	.12546E+01	-.14919E-02	-.74326E+01	-.10227E+02	-.43478E+01	.43056E+03	-.81695E+04	-.11887E+04
Link 31	-.92379E+00	.12360E+01	-.29169E-02	-.10408E+02	-.10457E+02	.35589E+00	.18873E+04	.31870E+02	-.15286E+03
Link 32	.51373E-01	.12579E+01	.87354E-02	-.13651E+02	-.13565E+02	.39166E+01	.14119E+04	-.16247E+05	.49806E+02
Link 33	.11199E+02	.12668E+01	-.52617E-02	-.16280E+02	-.42894E+01	.10535E+00	-.89491E+02	-.87135E+04	-.11380E+04
Link 34	.17261E+02	.12643E+01	.59543E-02	-.17041E+02	-.18367E+02	-.57260E+01	-.55149E+03	-.13900E+05	-.24428E+04
Link 35	.23322E+02	.12176E+01	-.18315E-01	-.17940E+02	-.71130E+01	.32407E+01	-.57119E+04	-.52054E+04	.42065E+03
Link 36	.29384E+02	.12962E+01	.41122E-01	-.28277E+02	-.19800E+02	.57254E+01	-.16563E+05	-.56090E+05	-.13803E+04
Link 37	.35439E+02	.12952E+01	-.37949E-01	-.33456E+02	-.14938E+01	.45633E+01	-.14109E+05	.97323E+04	-.28292E+04
Link 38	.41486E+02	.13638E+01	.63095E-01	-.21261E+02	.84114E+01	-.79519E+01	-.49624E+04	.15599E+04	-.32212E+04
Link 39	.47514E+02	.12197E+01	-.10930E+00	-.16919E+02	.46645E+02	.40993E+01	-.27986E+05	-.64991E+04	.46214E+04
Link 40	.53475E+02	.15636E+01	.21877E+00	-.22954E+02	.11701E+01	-.81603E+01	.89942E+04	-.11684E+06	-.53037E+04
Link 41	.59269E+02	.32381E+01	.35636E+00	.54398E+01	-.12979E+03	-.20095E+02	.93828E+04	-.57113E+05	-.21037E+05
Link 42	.65130E+02	.44533E+01	.71010E-01	.51305E+02	-.26520E+03	-.37789E+02	.42693E+05	-.36968E+05	-.23439E+05

Displacements, Velocities, and Accelerations

		X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Link	43	.71113E+02	.53073E+01	.23515E+00	.13495E+03	-.44537E+03	-.99074E+02	.26728E+05	-.21307E+06	-.68864E+04
Link	44	.77100E+02	.63037E+01	.92138E-01	.18515E+03	-.30435E+03	.38107E+02	.61055E+06	-.16380E+07	.37909E+03
Link	45	.81728E+02	.91626E+01	.10314E+01	.42568E+02	-.21224E+03	.87253E+02	-.80544E+05	.36295E+06	-.17760E+05
Link	46	.83382E+02	.14880E+02	.15562E+01	-.26470E+03	-.24715E+03	.35350E+02	-.13689E+06	.12704E+06	-.14626E+05
Link	47	.81832E+02	.20601E+02	.21383E+01	-.39046E+03	-.23444E+03	.34995E+02	-.11075E+06	-.32433E+06	-.28582E+05
Link	48	.77382E+02	.26238E+02	.27888E+01	-.45268E+03	-.16682E+03	.67376E+01	-.45160E+05	-.15876E+06	-.11931E+05
Link	49	.71539E+02	.25023E+02	-.30537E+01	-.41964E+03	-.49663E+02	-.32241E+02	-.60880E+05	-.10558E+06	.36347E+04
Link	50	.65517E+02	.25141E+02	.30049E+01	-.37909E+03	-.22275E+02	.79238E+01	-.50663E+05	.11063E+06	.40194E+04
Link	51	.59471E+02	.25373E+02	-.30780E+01	-.33304E+03	.50225E+02	-.25367E+02	-.41671E+05	.63486E+04	-.57532E+04
Link	52	.53442E+02	.25803E+02	.29389E+01	-.27595E+03	.57633E+02	.21253E+02	.11129E+05	.65225E+05	.33738E+04
Link	53	.47403E+02	.26214E+02	-.30789E+01	-.22666E+03	.20707E+02	-.90451E+01	.79228E+05	.18097E+06	-.62072E+02
Link	54	.41361E+02	.25692E+02	-.30302E+01	-.14554E+03	.77585E+02	-.86297E+01	.98882E+05	-.17596E+05	.12072E+03
Link	55	.35368E+02	.25681E+02	.30313E+01	-.95405E+02	.63039E+02	.14150E+02	.19577E+05	.34569E+05	.22036E+03
Link	56	.29367E+02	.25876E+02	-.30946E+01	-.10401E+03	.23523E+02	-.59990E+01	-.40529E+05	-.61834E+04	-.12326E+04
Link	57	.23405E+02	.26392E+02	.29221E+01	-.12151E+03	.22832E+02	.14348E+02	.14206E+05	-.59726E+04	.38818E+04
Link	58	.17448E+02	.26939E+02	-.31102E+01	-.11672E+03	-.13214E+01	-.19111E+01	-.47597E+05	.12994E+05	.39913E+04
Link	59	.11404E+02	.26716E+02	-.31013E+01	-.14417E+03	-.92239E+01	-.21585E+01	-.27579E+05	.27297E+05	.23433E+03
Link	60	.53488E+01	.26602E+02	.31400E+01	-.17830E+03	-.78650E+01	-.34732E+00	-.14637E+06	.13271E+04	-.11052E+04

Forces and Moments

		FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Vehicle		.20282E+05	.26565E+06	-.37309E+06						
Wheel	1	.73341E+04	.27939E+04	.00000E+00						
Wheel	2	-.36682E+03	.24857E+04	.00000E+00						
Wheel	3	-.40163E+02	.42390E+03	.00000E+00						
Wheel	4	-.33752E+02	.75651E+03	.00000E+00						
Wheel	5	-.28630E+04	.18110E+04	.00000E+00						
Wheel	6	.63163E+03	-.10400E+05	.00000E+00						
Wheel	7	-.35661E+04	-.36422E+05	.00000E+00						
Link	1	.00000E+00	-.20093E+02	.00000E+00	.15750E+05	-.43678E+03	-.20422E+05	.61806E+03	.23736E+02	-.65330E+02
Link	2	.00000E+00	-.20093E+02	.00000E+00	.20422E+05	-.61806E+03	-.16174E+05	.76276E+03	.65330E+02	-.36515E+02
Link	3	.00000E+00	-.20093E+02	.00000E+00	.16174E+05	-.76276E+03	-.83640E+04	.43589E+03	.36515E+02	.52984E+02
Link	4	.00000E+00	-.20093E+02	.00000E+00	.83640E+04	-.43589E+03	-.73352E+04	-.31970E+02	-.52984E+02	-.52256E+02
Link	5	.00000E+00	-.20093E+02	.00000E+00	.73352E+04	.31970E+02	-.50831E+04	.33331E+03	.52256E+02	-.72420E+02
Link	6	.00000E+00	-.20093E+02	.00000E+00	.50831E+04	-.33331E+03	-.64299E+04	.17812E+03	.72420E+02	.28509E+03
Link	7	.00000E+00	-.20093E+02	.00000E+00	.64299E+04	-.17812E+03	-.35031E+04	-.14104E+03	-.28509E+03	-.43023E+03
Link	8	.00000E+00	-.20093E+02	.00000E+00	.35031E+04	.14104E+03	-.39934E+04	.11588E+04	.43023E+03	.63241E+03
Link	9	.00000E+00	-.20093E+02	.00000E+00	.39934E+04	-.11588E+04	-.71557E+04	-.39603E+03	-.63241E+03	-.85623E+03
Link	10	.00000E+00	-.20093E+02	.00000E+00	.71557E+04	.39603E+03	-.62826E+04	.17127E+03	.85623E+03	.11652E+04
Link	11	.00000E+00	-.20093E+02	.00000E+00	.62826E+04	-.17127E+03	-.24774E+04	-.11853E+04	-.11652E+04	-.71401E+03
Link	12	.00000E+00	-.20093E+02	.00000E+00	.24774E+04	.11853E+04	-.31451E+04	.33861E+04	.71401E+03	.16601E+04
Link	13	.00000E+00	-.20093E+02	.00000E+00	.31451E+04	-.33861E+04	-.67683E+04	-.26634E+04	-.16601E+04	-.83087E+03
Link	14	.00000E+00	-.20093E+02	.00000E+00	.67683E+04	.26634E+04	-.66766E+04	.28294E+03	.83087E+03	.97355E+03
Link	15	.00000E+00	-.20093E+02	.00000E+00	.66766E+04	-.28294E+03	.15405E+04	-.55045E+04	-.97355E+03	.11613E+04
Link	16	.00000E+00	-.20093E+02	.00000E+00	-.15405E+04	.55045E+04	.16177E+05	-.26010E+04	-.11613E+04	.19172E+04
Link	17	-.15097E+05	-.10761E+05	.00000E+00	-.16177E+05	.26010E+04	.32077E+05	-.64006E+05	-.19172E+04	-.22561E+04
Link	18	-.31638E+05	-.11699E+06	.00000E+00	-.32077E+05	.64006E+05	-.26634E+04	.43377E+04	.22561E+04	.82419E+04
Link	19	.00000E+00	-.20093E+02	.00000E+00	.26634E+04	-.43377E+04	-.45655E+04	.71635E+04	-.82419E+04	-.25233E+04
Link	20	.00000E+00	-.20093E+02	.00000E+00	.45655E+04	-.71635E+04	-.36711E+04	.25177E+04	.25233E+04	-.18039E+04
Link	21	.00000E+00	-.20093E+02	.00000E+00	.36711E+04	-.25177E+04	.20113E+02	-.21720E+04	.18039E+04	.15727E+04
Link	22	-.22468E+04	-.54664E+04	.00000E+00	-.20113E+02	.21720E+04	.47732E+04	.15416E+04	-.15727E+04	.29054E+02
Link	23	.00000E+00	-.20093E+02	.00000E+00	-.47732E+04	-.15416E+04	.62041E+04	.25072E+03	-.29054E+02	-.14146E+04

Forces and Moments

		FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Link	24	.00000E+00	-.20093E+02	.00000E+00	-.62041E+04	-.25072E+03	.68830E+04	.16365E+04	.14166E+04	.30052E+03
Link	25	.00000E+00	-.20093E+02	.00000E+00	-.68830E+04	-.16365E+04	.77816E+04	.74736E+02	-.30052E+03	-.50522E+03
Link	26	.00000E+00	-.20093E+02	.00000E+00	-.77816E+04	-.74736E+02	.86349E+04	-.10470E+04	.50522E+03	.64299E+03
Link	27	.48686E+02	-.23258E+04	.00000E+00	-.86349E+04	.10470E+04	.85528E+04	.80903E+03	-.64299E+03	.30184E+03
Link	28	.00000E+00	-.20093E+02	.00000E+00	-.85528E+04	-.80903E+03	.84589E+04	.46991E+02	-.30184E+03	-.30960E+03
Link	29	.00000E+00	-.20093E+02	.00000E+00	-.84589E+04	-.46991E+02	.83469E+04	-.34586E+03	.30960E+03	-.33439E+03
Link	30	.00000E+00	-.20093E+02	.00000E+00	-.83469E+04	.34586E+03	.83692E+04	-.75058E+03	.33439E+03	.38393E+03
Link	31	-.10933E+03	-.13647E+04	.00000E+00	-.83692E+04	.75058E+03	.85767E+04	.61574E+03	-.38393E+03	.31916E+03
Link	32	.00000E+00	-.20093E+02	.00000E+00	-.85767E+04	-.61574E+03	.86501E+04	-.20899E+03	-.31916E+03	-.34503E+03
Link	33	.00000E+00	-.20093E+02	.00000E+00	-.86501E+04	.20899E+03	.86455E+04	-.64200E+03	.34503E+03	-.45482E+03
Link	34	.00000E+00	-.20093E+02	.00000E+00	-.86455E+04	.64200E+03	.86168E+04	-.13447E+04	.45482E+03	.68363E+03
Link	35	-.89341E+03	-.30433E+04	.00000E+00	-.86168E+04	.13447E+04	.92132E+04	.14279E+04	-.68363E+03	.33763E+03
Link	36	.00000E+00	-.20093E+02	.00000E+00	-.92132E+04	-.14279E+04	.83519E+04	-.14687E+04	-.33763E+03	-.27276E+03
Link	37	.00000E+00	-.20093E+02	.00000E+00	-.83519E+04	.14687E+04	.76183E+04	-.94248E+03	.27276E+03	-.80370E+03
Link	38	.00000E+00	-.20093E+02	.00000E+00	-.76183E+04	.94248E+03	.73602E+04	-.84127E+03	.80370E+03	.60569E+03
Link	39	-.11315E+04	-.39901E+04	.00000E+00	-.73602E+04	.84127E+03	.70365E+04	.28108E+04	-.60569E+03	-.27414E+03
Link	40	.00000E+00	-.20093E+02	.00000E+00	-.70365E+04	-.28108E+04	.75042E+04	-.32448E+04	.27414E+03	-.67404E+03
Link	41	.00000E+00	-.20093E+02	.00000E+00	-.75042E+04	.32448E+04	.79921E+04	-.61946E+04	.67404E+03	-.20955E+04
Link	42	.00000E+00	-.20093E+02	.00000E+00	-.79921E+04	.61946E+04	.10212E+05	-.80968E+04	.20955E+04	-.46762E+04
Link	43	.00000E+00	-.20093E+02	.00000E+00	-.10212E+05	.80968E+04	.11602E+05	.30031E+04	.46762E+04	.10970E+05
Link	44	.29412E+05	-.83410E+05	.00000E+00	-.11602E+05	-.30031E+04	.13938E+05	.12372E+04	-.10970E+05	.61488E+04
Link	45	.00000E+00	-.20093E+02	.00000E+00	-.13938E+05	-.12372E+04	.97499E+04	.20131E+05	-.61488E+04	-.30962E+04
Link	46	.00000E+00	-.20093E+02	.00000E+00	-.97499E+04	-.20131E+05	.26317E+04	.26757E+05	.30962E+04	.12747E+04
Link	47	.00000E+00	-.20093E+02	.00000E+00	-.26317E+04	-.26757E+05	-.31273E+04	.99115E+04	-.12747E+04	-.86861E+03
Link	48	.00000E+00	-.20093E+02	.00000E+00	.31273E+04	-.99115E+04	-.54757E+04	.16760E+04	.86861E+03	-.22208E+04
Link	49	.00000E+00	-.20093E+02	.00000E+00	.54757E+04	-.16760E+04	-.86414E+04	-.37939E+04	.22208E+04	.28026E+04
Link	50	.00000E+00	-.20093E+02	.00000E+00	.86414E+04	.37939E+04	-.11276E+05	.19791E+04	-.28026E+04	-.22913E+04
Link	51	.00000E+00	-.20093E+02	.00000E+00	.11276E+05	-.19791E+04	-.13443E+05	.23293E+04	.22913E+04	.32403E+04
Link	52	.20699E+04	.63775E+04	.00000E+00	.13443E+05	-.23293E+04	-.14934E+05	-.65645E+03	-.32403E+04	-.18990E+04
Link	53	-.15251E+04	.88929E+04	.00000E+00	.14934E+05	.65645E+03	-.92890E+04	-.13900E+03	.18990E+04	.14313E+03
Link	54	.00000E+00	-.20093E+02	.00000E+00	.92890E+04	.13900E+03	-.41471E+04	-.10339E+04	-.14313E+03	.13785E+04
Link	55	.00000E+00	-.20093E+02	.00000E+00	.41471E+04	.10339E+04	-.31291E+04	.78379E+03	-.13785E+04	-.13062E+04
Link	56	.00000E+00	-.20093E+02	.00000E+00	.31291E+04	-.78379E+03	-.52366E+04	.48235E+03	.13062E+04	.10777E+04
Link	57	-.26798E+03	.19594E+04	.00000E+00	.52366E+04	-.48235E+03	-.42299E+04	-.17876E+04	-.10777E+04	-.77625E+03
Link	58	.00000E+00	-.20093E+02	.00000E+00	.42299E+04	.17876E+04	-.67050E+04	-.10919E+04	.77625E+03	-.33050E+00
Link	59	.00000E+00	-.20093E+02	.00000E+00	.67050E+04	.10919E+04	-.81391E+04	.34768E+03	.33050E+00	.55306E+02
Link	60	.00000E+00	-.20093E+02	.00000E+00	.81391E+04	-.34768E+03	-.15750E+05	.43678E+03	-.55306E+02	-.23736E+02

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2
1	.60000E+01	.15757E+05	.20631E+05	-.11250E+00	.31198E-02	.14587E+00	-.44147E-02	.11255E+00	.14594E+00
2	.60000E+01	.20631E+05	.16192E+05	-.14587E+00	.44147E-02	.11553E+00	-.54483E-02	.14594E+00	.11565E+00
3	.60000E+01	.16192E+05	.83753E+04	-.11553E+00	.54483E-02	.59743E-01	-.31135E-02	.11565E+00	.59824E-01
4	.60000E+01	.83753E+04	.73353E+04	-.59743E-01	.31135E-02	.52394E-01	.22836E-03	.59824E-01	.52395E-01
5	.60000E+01	.73353E+04	.50940E+04	-.52394E-01	-.22836E-03	.36308E-01	-.23808E-02	.52395E-01	.36386E-01
6	.60000E+01	.50940E+04	.64323E+04	-.36308E-01	.23808E-02	.45928E-01	-.12723E-02	.36386E-01	.45945E-01
7	.60000E+01	.64323E+04	.35059E+04	-.45928E-01	.12723E-02	.25022E-01	.10074E-02	.45945E-01	.25042E-01
8	.60000E+01	.35059E+04	.41581E+04	-.25022E-01	-.10074E-02	.28524E-01	-.82770E-02	.25042E-01	.29701E-01
9	.60000E+01	.41581E+04	.71667E+04	-.28524E-01	.82770E-02	.51112E-01	.28288E-02	.29701E-01	.51190E-01
10	.60000E+01	.71667E+04	.62849E+04	-.51112E-01	-.28288E-02	.44875E-01	-.12234E-02	.51190E-01	.44892E-01
11	.60000E+01	.62849E+04	.27463E+04	-.44875E-01	.12234E-02	.17696E-01	.84665E-02	.44892E-01	.19617E-01
12	.60000E+01	.27463E+04	.46214E+04	-.17696E-01	-.84665E-02	.22465E-01	-.24186E-01	.19617E-01	.33010E-01

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2	
13	.60000E+01	.46214E+04	.72735E+04	-.22465E-01	.24186E-01	.48345E-01	.19024E-01	.33010E-01	.51953E-01	
14	.60000E+01	.72735E+04	.66826E+04	-.48345E-01	-.19024E-01	.47690E-01	-.20210E-02	.51953E-01	.47733E-01	
15	.60000E+01	.66826E+04	.57160E+04	-.47690E-01	.20210E-02	-.11004E-01	.39318E-01	.47733E-01	.40829E-01	
16	.60000E+01	.57160E+04	.16384E+05	.11004E-01	-.39318E-01	-.11555E+00	.18578E-01	.40829E-01	.11703E+00	
17	.60000E+01	.16384E+05	.71594E+05	.11555E+00	-.18578E-01	-.22912E+00	.45719E+00	.11703E+00	.51139E+00	Wheel 1
18	.60000E+01	.71594E+05	.50901E+04	.22912E+00	-.45719E+00	.19024E-01	-.30984E-01	.51139E+00	.36358E-01	Wheel 1
19	.60000E+01	.50901E+04	.84946E+04	-.19024E-01	.30984E-01	.32610E-01	-.51168E-01	.36358E-01	.60676E-01	
20	.60000E+01	.84946E+04	.44514E+04	-.32610E-01	.51168E-01	.26222E-01	-.17983E-01	.60676E-01	.31796E-01	
21	.60000E+01	.44514E+04	.21721E+04	-.26222E-01	.17983E-01	-.14366E-03	.15515E-01	.31796E-01	.15515E-01	
22	.60000E+01	.21721E+04	.50159E+04	.14366E-03	-.15515E-01	-.34094E-01	-.11012E-01	.15515E-01	.35828E-01	Wheel 2
23	.60000E+01	.50159E+04	.62092E+04	.34094E-01	.11012E-01	-.44315E-01	-.17909E-02	.35828E-01	.44351E-01	
24	.60000E+01	.62092E+04	.70749E+04	.44315E-01	.17909E-02	-.69164E-01	-.11689E-01	.44351E-01	.50535E-01	
25	.60000E+01	.70749E+04	.77819E+04	.49164E-01	.11689E-01	-.55583E-01	-.53383E-03	.50535E-01	.55585E-01	
26	.60000E+01	.77819E+04	.84997E+04	.55583E-01	.53383E-03	-.60249E-01	.74786E-02	.55585E-01	.60712E-01	
27	.60000E+01	.84997E+04	.85910E+04	.60249E-01	-.74786E-02	-.61092E-01	-.57788E-02	.60712E-01	.61364E-01	Wheel 3
28	.60000E+01	.85910E+04	.84591E+04	.61092E-01	.57788E-02	-.60421E-01	-.33565E-03	.61364E-01	.60422E-01	
29	.60000E+01	.84591E+04	.83540E+04	.60421E-01	.33565E-03	-.59620E-01	.24704E-02	.60422E-01	.59672E-01	
30	.60000E+01	.83540E+04	.84028E+04	.59620E-01	-.24704E-02	-.59780E-01	.53613E-02	.59672E-01	.60020E-01	
31	.60000E+01	.84028E+04	.85988E+04	.59780E-01	-.53613E-02	-.61262E-01	-.43982E-02	.60020E-01	.61420E-01	Ground and Wheel 4
32	.60000E+01	.85988E+04	.86527E+04	.61262E-01	.43982E-02	-.61787E-01	.14928E-02	.61420E-01	.61805E-01	
33	.60000E+01	.86527E+04	.86693E+04	.61787E-01	-.14928E-02	-.61753E-01	.45857E-02	.61805E-01	.61923E-01	
34	.60000E+01	.86693E+04	.87211E+04	.61753E-01	-.45857E-02	-.61549E-01	.96049E-02	.61923E-01	.62294E-01	
35	.60000E+01	.87211E+04	.93232E+04	.61549E-01	-.96049E-02	-.65809E-01	-.10200E-01	.62294E-01	.66594E-01	Ground and Wheel 5
36	.60000E+01	.93232E+04	.84801E+04	.65809E-01	.10200E-01	-.59657E-01	.10490E-01	.66594E-01	.60572E-01	
37	.60000E+01	.84801E+04	.76763E+04	.59657E-01	-.10490E-01	-.54416E-01	.67320E-02	.60572E-01	.54831E-01	
38	.60000E+01	.76763E+04	.74081E+04	.54416E-01	-.67320E-02	-.52573E-01	.60091E-02	.54831E-01	.52915E-01	
39	.60000E+01	.74081E+04	.75771E+04	.52573E-01	-.60091E-02	-.50261E-01	-.20077E-01	.52915E-01	.54122E-01	Ground and Wheel 6
40	.60000E+01	.75771E+04	.81757E+04	.50261E-01	.20077E-01	-.53601E-01	.23177E-01	.54122E-01	.58398E-01	
41	.60000E+01	.81757E+04	.10112E+05	.53601E-01	-.23177E-01	-.57086E-01	.44247E-01	.58398E-01	.72227E-01	
42	.60000E+01	.10112E+05	.13033E+05	.57086E-01	-.44247E-01	-.72944E-01	.57835E-01	.72227E-01	.93089E-01	
43	.60000E+01	.13033E+05	.11984E+05	.72944E-01	-.57835E-01	-.82871E-01	-.21451E-01	.93089E-01	.85602E-01	
44	.60000E+01	.11984E+05	.13993E+05	.82871E-01	.21451E-01	-.99559E-01	-.88373E-02	.85602E-01	.99951E-01	Wheel 7
45	.60000E+01	.13993E+05	.22368E+05	.99559E-01	.88373E-02	-.69642E-01	-.14379E+00	.99951E-01	.15977E+00	
46	.60000E+01	.22368E+05	.26886E+05	.69642E-01	.14379E+00	-.18798E-01	-.19112E+00	.15977E+00	.19204E+00	
47	.60000E+01	.26886E+05	.10393E+05	.18798E-01	.19112E+00	.22338E-01	-.70796E-01	.19204E+00	.74237E-01	
48	.60000E+01	.10393E+05	.57264E+04	-.22338E-01	.70796E-01	.39112E-01	-.11971E-01	.74237E-01	.40903E-01	
49	.60000E+01	.57264E+04	.94376E+04	-.39112E-01	.11971E-01	.61724E-01	.27099E-01	.40903E-01	.67411E-01	
50	.60000E+01	.94376E+04	.11448E+05	-.61724E-01	-.27099E-01	.80542E-01	-.14137E-01	.67411E-01	.81773E-01	
51	.60000E+01	.11448E+05	.13643E+05	-.80542E-01	.14137E-01	.96020E-01	-.16638E-01	.81773E-01	.97451E-01	
52	.60000E+01	.13643E+05	.14948E+05	-.96020E-01	.16638E-01	.10667E+00	.46889E-02	.97451E-01	.10677E+00	Wheel 6
53	.60000E+01	.14948E+05	.92900E+04	-.10667E+00	-.46889E-02	.66350E-01	.99283E-03	.10677E+00	.66357E-01	Wheel 6
54	.60000E+01	.92900E+04	.42741E+04	-.66350E-01	-.99283E-03	.29622E-01	.73851E-02	.66357E-01	.30529E-01	
55	.60000E+01	.42741E+04	.32258E+04	-.29622E-01	-.73851E-02	.22351E-01	-.55985E-02	.30529E-01	.23041E-01	
56	.60000E+01	.32258E+04	.52588E+04	-.22351E-01	.55985E-02	.37404E-01	-.34453E-02	.23041E-01	.37563E-01	
57	.60000E+01	.52588E+04	.45922E+04	-.37404E-01	.34453E-02	.30214E-01	.12769E-01	.37563E-01	.32801E-01	Wheel 5
58	.60000E+01	.45922E+04	.67933E+04	-.30214E-01	-.12769E-01	.47893E-01	.77990E-02	.32801E-01	.48523E-01	
59	.60000E+01	.67933E+04	.81465E+04	-.47893E-01	-.77990E-02	.58136E-01	-.24834E-02	.48523E-01	.58189E-01	
60	.60000E+01	.81465E+04	.15757E+05	-.58136E-01	.24834E-02	.11250E+00	-.31198E-02	.58189E-01	.11255E+00	

Cyc	Time	Time-Step	DW-RPM
31	.0031	.0001000	2.500
32	.0032	.0001000	2.500

33	.0033	.0001000	2.500
34	.0034	.0001000	2.500
35	.0035	.0001000	2.500
36	.0036	.0001000	2.500
37	.0037	.0001000	2.500
38	.0038	.0001000	2.500
39	.0039	.0001000	2.500
40	.0040	.0001000	2.500

OUTPUT AT TIME .0040

Displacements, Velocities, and Accelerations

	X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Vehicle	-.57777E+00	.26100E+02	.53219E-05	-.14305E+03	.45373E+02	-.39992E-02	.10799E+04	.75202E+04	-.11048E+02
Wheel 1	-.74436E+02	.20053E+02	.62832E-01	.28275E+03	-.32144E+03	.15708E+02	-.65121E+05	-.11749E+03	.00000E+00
Wheel 2	-.50322E+02	.14571E+02	.45584E-01	-.16513E+03	.80631E+02	.11396E+02	-.20181E+05	-.26571E+05	.00000E+00
Wheel 3	-.25579E+02	.14020E+02	.45584E-01	-.14650E+03	-.42115E+01	.11396E+02	.40673E+03	-.14795E+05	.00000E+00
Wheel 4	-.56402E+00	.13965E+02	.45584E-01	-.14703E+03	.13231E+02	.11396E+02	-.71217E+03	-.13826E+05	.00000E+00
Wheel 5	.24814E+02	.13844E+02	.45584E-01	-.30638E+03	.44501E+02	.11396E+02	-.10204E+05	-.69538E+05	.00000E+00
Wheel 6	.49420E+02	.13740E+02	.45584E-01	-.11656E+03	-.11813E+02	.11396E+02	.39150E+04	.17314E+05	.00000E+00
Wheel 7	.73705E+02	.14248E+02	.62832E-01	-.38732E+03	-.60844E+03	.15708E+02	.14500E+05	-.32721E+05	.00000E+00
Link 1	-.10535E+01	.26704E+02	.31113E+01	-.31666E+03	.76687E+01	-.47793E+00	-.16573E+05	.13927E+05	-.30691E+03
Link 2	-.72076E+01	.26945E+02	.30942E+01	-.27533E+03	.51925E+01	.58751E-01	.24678E+05	-.54822E+04	.19848E+03
Link 3	-.13349E+02	.27270E+02	.30826E+01	-.29842E+03	.35470E+01	.92602E+00	.55889E+05	-.61407E+04	.13504E+04
Link 4	-.19467E+02	.27623E+02	.30841E+01	-.36453E+03	.42859E+01	.14390E+01	.12120E+06	-.20789E+04	.95391E+03
Link 5	-.25546E+02	.27827E+02	.31322E+01	-.41077E+03	.94760E+01	-.20526E+01	.66561E+05	-.83539E+04	-.32296E+03
Link 6	-.31604E+02	.27937E+02	.31143E+01	-.44513E+03	.19126E+02	-.17631E+01	.72174E+05	.19814E+04	.39464E+03
Link 7	-.37625E+02	.28271E+02	.30579E+01	-.43447E+03	.19719E+02	.33260E+01	.40574E+05	.39930E+04	-.28096E+03
Link 8	-.43630E+02	.28616E+02	.31112E+01	-.39331E+03	.14717E+02	-.37542E+01	.12294E+06	-.24529E+05	.11574E+04
Link 9	-.49589E+02	.28968E+02	.30523E+01	-.34810E+03	.13093E+01	.52600E+01	.12620E+06	.86594E+04	-.62414E+03
Link 10	-.55501E+02	.29288E+02	.31233E+01	-.26523E+03	.29835E+01	-.46972E+01	-.19570E+05	.55118E+04	.89026E+03
Link 11	-.61417E+02	.29640E+02	.30421E+01	-.19553E+03	.13296E+02	.70824E+01	-.14882E+06	.33972E+05	-.65405E+04
Link 12	-.67390E+02	.29941E+02	-.31388E+01	-.17046E+03	-.27553E+02	-.35751E+01	-.10469E+06	-.66421E+05	.13778E+04
Link 13	-.73377E+02	.30404E+02	.29797E+01	-.13364E+03	-.10808E+03	.26130E+02	.48970E+05	.34696E+05	.20359E+04
Link 14	-.79031E+02	.29551E+02	-.26793E+01	-.53372E+02	-.15727E+03	-.19201E+01	.17228E+06	-.38179E+05	.81186E+04
Link 15	-.83383E+02	.25743E+02	-.21825E+01	.74630E+02	-.14315E+03	.12272E+02	.10037E+06	.54907E+05	.25359E+05
Link 16	-.84506E+02	.20338E+02	-.14012E+01	.92378E+02	-.12042E+03	.23259E+02	.66690E+03	-.51786E+05	.34776E+05
Link 17	-.82046E+02	.15015E+02	-.90195E+00	.12726E+03	-.10978E+03	-.60281E+01	.14937E+06	-.10029E+07	.37754E+04
Link 18	-.77097E+02	.11438E+02	-.30031E+00	-.10104E+02	-.23110E+03	-.10885E+03	-.12971E+07	-.99061E+06	-.42206E+05
Link 19	-.71423E+02	.96132E+01	-.32105E+00	-.52988E+02	-.41219E+03	.42783E+02	-.92422E+04	-.11461E+06	-.16749E+05
Link 20	-.65803E+02	.75983E+01	-.35210E+00	.29831E+02	-.22427E+03	.17713E+02	.15506E+05	.70353E+05	-.12696E+05
Link 21	-.60299E+02	.53011E+01	-.43174E-00	.65447E+02	-.18185E+03	.45454E+01	.39089E+05	.74783E+05	-.99012E+03
Link 22	-.54943E+02	.26668E+01	-.48535E+00	.92035E+02	-.10261E+03	.28781E+02	.62874E+05	-.29514E+05	.24762E+04
Link 23	-.49288E+02	.12880E+01	.36385E-02	.92056E+02	.14391E+02	.13473E+02	.61300E+05	-.18516E+05	.19273E+04
Link 24	-.43266E+02	.13990E+01	.32318E-01	.60885E+02	.41635E+02	-.56246E+01	.36744E+05	-.23569E+05	.10388E+02
Link 25	-.37234E+02	.13352E+01	-.51759E-01	.43986E+02	.19374E+02	.11178E+01	.15502E+05	.20127E+05	-.30570E+03
Link 26	-.31195E+02	.12579E+01	.25287E-01	.32041E+02	-.11443E+02	-.83612E+01	.11153E+05	.67955E+04	.15335E+04
Link 27	-.25149E+02	.12740E+01	-.21502E-01	.18201E+02	-.24833E+02	.13177E+01	.97951E+04	-.68447E+04	.16515E+04
Link 28	-.19099E+02	.12424E+01	.10174E-01	.62934E+01	-.10356E+02	.37033E+01	.66777E+04	.10365E+05	.16963E+03
Link 29	-.13045E+02	.12667E+01	-.24048E-02	-.87659E+00	-.16914E+01	.13133E-01	.49053E+04	.69803E+04	.84424E+03
Link 30	-.69898E+01	.12451E+01	-.57866E-02	-.48912E+01	-.55793E+01	-.37850E+01	.36967E+04	.12868E+05	.18996E+04
Link 31	-.93301E+00	.12237E+01	-.27999E-02	-.81206E+01	-.11289E+02	-.12092E+00	.27046E+04	.12634E+05	-.47086E+03
Link 32	.51247E+01	.12444E+01	.11976E-01	-.11628E+02	-.72733E+01	.23458E+01	.23255E+04	.22591E+05	-.23795E+04
Link 33	.11183E+02	.12611E+01	-.56107E-02	-.15135E+02	-.41874E+01	-.56017E+00	.55247E+03	.89873E+04	-.19545E+03
Link 34	.17242E+02	.12448E+01	-.18387E-03	-.20248E+02	-.16763E+02	-.59281E+01	-.54920E+04	.15288E+05	.13458E+04
Link 35	.23299E+02	.12000E+01	-.15810E-01	-.26404E+02	-.20686E+02	.14957E+01	-.62534E+04	.14056E+05	-.23857E+04
Link 36	.29352E+02	.12711E+01	.44830E-01	-.33318E+02	-.13203E+02	.18091E+01	.39513E+04	.46699E+05	-.39537E+04
Link 37	.35404E+02	.13054E+01	-.33894E-01	-.34991E+02	.18074E+02	.43783E+01	-.14947E+04	.76453E+04	.15731E+04
Link 38	.41455E+02	.13732E+01	.54986E-01	-.41228E+02	.56821E+00	-.82521E+01	-.23312E+05	-.43484E+05	-.17486E+04
Link 39	.47483E+02	.12165E+01	-.10356E+00	-.39080E+02	-.42924E+02	.61391E+01	-.55544E+04	-.47161E+05	-.60067E+03
Link 40	.53457E+02	.15237E+01	.20653E+00	-.14978E+02	-.46525E+02	-.14537E+02	.51883E+04	.40596E+05	-.71766E+03
Link 41	.59290E+02	.31241E+01	.32847E+00	.39824E+02	-.73758E+02	-.29426E+02	.47478E+05	.12587E+06	.73163E+04
Link 42	.65202E+02	.42609E+01	.34922E-01	.90379E+02	-.10191E+03	-.25212E+02	.44783E+05	.19324E+06	.37751E+05

Displacements, Velocities, and Accelerations

	X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Link 43	.71257E+02	.49550E+01	.15163E+00	.14535E+03	-.31164E+03	-.61834E+02	-.11299E+05	.24379E+05	.56140E+05
Link 44	.77281E+02	.59633E+01	.13703E+00	.15320E+03	-.36570E+03	.54024E+02	.67725E+06	-.18476E+07	.24207E+05
Link 45	.81701E+02	.90701E+01	.11034E+01	-.91265E+02	-.60039E+02	.59180E+02	-.14409E+06	-.35673E+05	-.25099E+05
Link 46	.83062E+02	.14754E+02	.15823E+01	-.36067E+03	-.44494E+02	.19771E+02	-.86870E+05	.93287E+05	-.99024E+04
Link 47	.81382E+02	.20296E+02	.21555E+01	-.48650E+03	-.28393E+03	.52869E+01	-.47453E+05	.15877E+06	-.16559E+05
Link 48	.76911E+02	.23952E+02	.27821E+01	-.48075E+03	-.36876E+03	-.19943E+02	-.12794E+05	-.10722E+06	-.28521E+05
Link 49	.71096E+02	.24904E+02	-.30871E+01	-.45153E+03	-.16612E+03	-.37967E+02	.28810E+04	-.74580E+05	-.16821E+05
Link 50	.65115E+02	.25157E+02	.30133E+01	-.41364E+03	.11000E+02	.65119E+01	-.76777E+04	-.78651E+05	-.92255E+04
Link 51	.59129E+02	.25437E+02	-.31058E+01	-.36105E+03	.84576E+02	-.29399E+02	.13554E+05	.55399E+05	-.27188E+04
Link 52	.53172E+02	.25897E+02	.29593E+01	-.26325E+03	.11198E+03	.18064E+02	.17281E+05	-.23742E+04	-.74603E+04
Link 53	.47219E+02	.26281E+02	-.30868E+01	-.15991E+03	.65381E+02	-.60748E+01	.18112E+05	-.55593E+05	.52052E+04
Link 54	.41242E+02	.25776E+02	-.30368E+01	-.11931E+03	.10312E+03	-.38373E+01	-.36067E+05	.54959E+05	.68973E+04
Link 55	.35260E+02	.25743E+02	.30458E+01	-.12590E+03	.72369E+02	.14751E+02	-.41008E+05	.19762E+05	.61796E+03
Link 56	.29249E+02	.25912E+02	-.31020E+01	-.12524E+03	.55307E+02	-.87620E+01	-.14337E+05	.59127E+05	-.37758E+04
Link 57	.23281E+02	.26425E+02	.29370E+01	-.13970E+03	.51732E+02	.14817E+02	-.63593E+05	.62427E+05	-.66099E+03
Link 58	.17296E+02	.26933E+02	-.31104E+01	-.18407E+03	-.77038E+01	.91345E+00	-.74609E+05	.75484E+04	.18202E+04
Link 59	.11222E+02	.26719E+02	-.31028E+01	-.23105E+03	.69385E+01	-.98849E+00	-.13382E+06	-.32965E+04	.46294E+03
Link 60	.50978E+01	.26603E+02	.31394E+01	-.29624E+03	.12130E+02	-.63404E+00	-.69402E+05	.23454E+05	.58787E+03

Forces and Moments

	FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Vehicle	.27949E+05	.19662E+06	-.14142E+07						
Wheel 1	-.20188E+05	-.36423E+02	.00000E+00						
Wheel 2	-.23410E+04	-.28502E+04	.00000E+00						
Wheel 3	.47180E+02	-.17162E+04	.00000E+00						
Wheel 4	-.82612E+02	-.16039E+04	.00000E+00						
Wheel 5	-.11837E+04	-.80665E+04	.00000E+00						
Wheel 6	.45413E+03	.20084E+04	.00000E+00						
Wheel 7	.44951E+04	-.10144E+05	.00000E+00						
Link 1	-.42482E+01	.90670E+02	.00000E+00	.21378E+05	-.45977E+03	-.22236E+05	.10935E+04	.49929E+02	.57952E+01
Link 2	.00000E+00	-.20093E+02	.00000E+00	.22236E+05	-.10935E+04	-.20953E+05	.82850E+03	-.57952E+01	.45299E+02
Link 3	.00000E+00	-.20093E+02	.00000E+00	.20953E+05	-.82850E+03	-.18047E+05	.52928E+03	-.45299E+02	.45658E+02
Link 4	.00000E+00	-.20093E+02	.00000E+00	.18047E+05	-.52928E+03	-.11744E+05	.44127E+03	-.45658E+02	-.17959E+03
Link 5	.00000E+00	-.20093E+02	.00000E+00	.11744E+05	-.44127E+03	-.82830E+04	.26958E+02	.17959E+03	-.16416E+02
Link 6	.00000E+00	-.20093E+02	.00000E+00	.82830E+04	-.26958E+02	-.45300E+04	.15008E+03	.16416E+02	.29251E+03
Link 7	.00000E+00	-.20093E+02	.00000E+00	.45300E+04	-.15008E+03	-.24201E+04	.37781E+03	-.29251E+03	-.46329E+03
Link 8	.00000E+00	-.20093E+02	.00000E+00	.24201E+04	-.37781E+03	.39730E+04	-.87762E+03	.46329E+03	.61013E+03
Link 9	.00000E+00	-.20093E+02	.00000E+00	-.39730E+04	.87762E+03	.10535E+05	-.40724E+03	-.61013E+03	-.66063E+03
Link 10	.00000E+00	-.20093E+02	.00000E+00	-.10535E+05	.40724E+03	.95178E+04	-.10053E+03	.66063E+03	.78767E+03
Link 11	.00000E+00	-.20093E+02	.00000E+00	-.95178E+04	.10053E+03	.17789E+04	.16861E+04	-.78767E+03	-.64812E+03
Link 12	.00000E+00	-.20093E+02	.00000E+00	-.17789E+04	-.16861E+04	-.36652E+04	-.17477E+04	.64812E+03	.20759E+04
Link 13	.00000E+00	-.20093E+02	.00000E+00	.36652E+04	.17477E+04	-.11187E+04	.76603E+02	-.20759E+04	-.91040E+03
Link 14	.00000E+00	-.20093E+02	.00000E+00	.11187E+04	-.76603E+02	.78398E+04	-.18886E+04	.91040E+03	.22809E+04
Link 15	.00000E+00	-.20093E+02	.00000E+00	-.78398E+04	.18886E+04	.13059E+05	.98666E+03	-.22809E+04	.26544E+04
Link 16	.00000E+00	-.20093E+02	.00000E+00	-.13059E+05	-.98666E+03	.13093E+05	-.16861E+04	-.26544E+04	-.12921E+04
Link 17	-.10345E+05	-.68693E+04	.00000E+00	-.13093E+05	.16861E+04	.31205E+05	-.46968E+05	.12921E+04	-.71149E+04
Link 18	-.30792E+05	-.99723E+05	.00000E+00	-.31205E+05	.46968E+05	-.54520E+04	.12433E+04	.71149E+04	.12433E+05
Link 19	.00000E+00	-.20093E+02	.00000E+00	.54520E+04	-.12433E+04	-.59326E+04	-.46964E+04	-.12433E+05	-.21329E+04
Link 20	.00000E+00	-.20093E+02	.00000E+00	.59326E+04	.46964E+04	-.51263E+04	-.10180E+04	.21329E+04	-.12621E+04
Link 21	.00000E+00	-.20093E+02	.00000E+00	.51263E+04	.10180E+04	-.30936E+04	.28908E+04	.12621E+04	.18745E+04
Link 22	.00000E+00	-.20093E+02	.00000E+00	.30936E+04	-.28908E+04	.17583E+03	.13762E+04	-.18746E+04	-.16453E+03
Link 23	.00000E+00	-.20093E+02	.00000E+00	-.17583E+03	-.13762E+04	.33634E+04	.43349E+03	.16453E+03	-.15076E+04

Forces and Moments

		FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Link	24	.00000E+00	-.20093E+02	.00000E+00	-.33634E+04	-.43349E+03	.52741E+04	-.77201E+03	.15076E+04	.36658E+03
Link	25	.00000E+00	-.20093E+02	.00000E+00	-.52741E+04	.77201E+03	.60803E+04	.29467E+03	-.36658E+03	-.60757E+03
Link	26	.00000E+00	-.20093E+02	.00000E+00	-.60803E+04	-.29467E+03	.66602E+04	.66813E+03	.60757E+03	.69180E+03
Link	27	.00000E+00	-.20093E+02	.00000E+00	-.66602E+04	-.66813E+03	.71695E+04	.33230E+03	-.69180E+03	.26729E+03
Link	28	.00000E+00	.73566E+03	.00000E+00	-.71695E+04	-.33230E+03	.75168E+04	.13561E+03	-.26729E+03	-.33189E+03
Link	29	.00000E+00	-.20093E+02	.00000E+00	-.75168E+04	-.13561E+03	.77719E+04	.41468E+03	.33189E+03	-.32017E+03
Link	30	.00000E+00	.46925E+03	.00000E+00	-.77719E+04	-.41468E+03	.79641E+04	.61456E+03	.32017E+03	.30825E+03
Link	31	-.10702E+02	.22367E+04	.00000E+00	-.79641E+04	-.61456E+03	.81154E+04	-.96514E+03	-.30825E+03	.23612E+03
Link	32	.00000E+00	.54282E+03	.00000E+00	-.81154E+04	.96514E+03	.82366E+04	-.33326E+03	-.23612E+03	-.27857E+03
Link	33	.00000E+00	-.20093E+02	.00000E+00	-.82366E+04	.33326E+03	.82651E+04	.15419E+03	.27857E+03	-.42964E+03
Link	34	.00000E+00	.49953E+03	.00000E+00	-.82651E+04	-.15419E+03	.79795E+04	.44964E+03	.42964E+03	.57600E+03
Link	35	-.18744E+03	.34124E+04	.00000E+00	-.79795E+04	-.44964E+03	.78418E+04	-.22319E+04	-.57600E+03	.16163E+03
Link	36	.00000E+00	-.20093E+02	.00000E+00	-.78418E+04	.22319E+04	.80472E+04	.21653E+03	-.16163E+03	.35104E+02
Link	37	.00000E+00	-.20093E+02	.00000E+00	-.80472E+04	-.21653E+03	.79695E+04	.63418E+03	-.35104E+02	-.84042E+03
Link	38	.00000E+00	-.20093E+02	.00000E+00	-.79695E+04	-.63418E+03	.67573E+04	-.16069E+04	.84042E+03	.82930E+03
Link	39	-.11900E+04	-.43606E+04	.00000E+00	-.67573E+04	.16069E+04	.76585E+04	.30137E+03	-.82930E+03	-.10071E+04
Link	40	.00000E+00	-.20093E+02	.00000E+00	-.76585E+04	-.30137E+03	.79283E+04	.24325E+04	.10071E+04	-.95228E+03
Link	41	.00000E+00	-.20093E+02	.00000E+00	-.79283E+04	-.24325E+04	.10397E+05	.89980E+04	.95228E+03	-.31074E+03
Link	42	.00000E+00	-.20093E+02	.00000E+00	-.10397E+05	-.89980E+04	.12726E+05	.19066E+05	.31074E+03	-.27527E+04
Link	43	.00000E+00	-.20093E+02	.00000E+00	-.12726E+05	-.19066E+05	.12138E+05	.20354E+05	.27527E+04	.95028E+04
Link	44	.33797E+05	-.78334E+05	.00000E+00	-.12138E+05	-.20354E+05	.13558E+05	.26210E+04	-.95028E+04	.25890E+04
Link	45	.00000E+00	-.20093E+02	.00000E+00	-.13558E+05	-.26210E+04	.60647E+04	.78611E+03	-.25890E+04	-.21707E+04
Link	46	.00000E+00	-.20093E+02	.00000E+00	-.60647E+04	-.78611E+03	.15474E+04	.56571E+04	.21707E+04	.91855E+02
Link	47	.00000E+00	-.20093E+02	.00000E+00	-.15474E+04	-.56571E+04	-.92014E+03	.13933E+05	-.91855E+02	-.67304E+03
Link	48	.00000E+00	-.20093E+02	.00000E+00	.92014E+03	-.13933E+05	-.15854E+04	.83783E+04	.67304E+03	-.55599E+03
Link	49	.00000E+00	-.20093E+02	.00000E+00	.15854E+04	-.83783E+04	-.14356E+04	.45202E+04	.55599E+03	.32513E+04
Link	50	.00000E+00	-.20093E+02	.00000E+00	.14356E+04	-.45202E+04	-.18349E+04	.45043E+03	-.32513E+04	-.25882E+04
Link	51	.00000E+00	-.20093E+02	.00000E+00	.18349E+04	-.45043E+03	-.11301E+04	.33513E+04	.25882E+04	.34181E+04
Link	52	.78566E+03	.25252E+04	.00000E+00	.11301E+04	-.33513E+04	-.10171E+04	.70265E+03	-.34181E+04	-.14557E+04
Link	53	-.28825E+03	.16229E+04	.00000E+00	.10171E+04	-.70265E+03	.21300E+03	-.38111E+04	.14557E+04	.29604E+03
Link	54	.00000E+00	-.20093E+02	.00000E+00	-.21300E+03	.38111E+04	-.16625E+04	-.93311E+03	-.29604E+03	.10806E+04
Link	55	.00000E+00	-.20093E+02	.00000E+00	.16625E+04	.93311E+03	-.37949E+04	.11460E+03	-.10806E+04	-.16318E+04
Link	56	.00000E+00	-.20093E+02	.00000E+00	.37949E+04	-.11460E+03	-.45404E+04	.32093E+04	.16318E+04	.13937E+04
Link	57	-.91578E+03	.74967E+04	.00000E+00	.45404E+04	-.32093E+04	-.69315E+04	-.10412E+04	-.13937E+04	-.61622E+03
Link	58	.00000E+00	-.20093E+02	.00000E+00	.69315E+04	.10412E+04	-.10811E+05	-.62861E+03	.61622E+03	-.13952E+03
Link	59	.00000E+00	-.20093E+02	.00000E+00	.10811E+05	.62861E+03	-.17770E+05	-.77994E+03	.13952E+03	-.62750E+02
Link	60	.00000E+00	-.20093E+02	.00000E+00	.17770E+05	.77994E+03	-.21378E+05	.45977E+03	.62750E+02	-.49929E+02

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2	
1	.60000E+01	.21383E+05	.22263E+05	-.15270E+00	.32841E-02	.15883E+00	-.78106E-02	.15274E+00	.15902E+00	Wheel 4
2	.60000E+01	.22263E+05	.20969E+05	-.15883E+00	.78106E-02	.14966E+00	-.59179E-02	.15902E+00	.14978E+00	
3	.60000E+01	.20969E+05	.18054E+05	-.14966E+00	.59179E-02	.12890E+00	-.37806E-02	.14978E+00	.12896E+00	
4	.60000E+01	.18054E+05	.11752E+05	-.12890E+00	.37806E-02	.83887E-01	-.31519E-02	.12896E+00	.83946E-01	
5	.60000E+01	.11752E+05	.82830E+04	-.83887E-01	.31519E-02	.59164E-01	-.19256E-03	.83946E-01	.59165E-01	
6	.60000E+01	.82830E+04	.45324E+04	-.59164E-01	.19256E-03	.32357E-01	-.10720E-02	.59165E-01	.32375E-01	
7	.60000E+01	.45324E+04	.24494E+04	-.32357E-01	.10720E-02	.17286E-01	-.26986E-02	.32375E-01	.17496E-01	
8	.60000E+01	.24494E+04	.40688E+04	-.17286E-01	.26986E-02	-.28379E-01	.62687E-02	.17496E-01	.29063E-01	
9	.60000E+01	.40688E+04	.10543E+05	.28379E-01	-.62687E-02	-.75253E-01	.29088E-02	.29063E-01	.75309E-01	
10	.60000E+01	.10543E+05	.95183E+04	.75253E-01	-.29088E-02	-.67984E-01	.71807E-03	.75309E-01	.67988E-01	
11	.60000E+01	.95183E+04	.24510E+04	.67984E-01	-.71807E-03	-.12706E-01	-.12043E-01	.67988E-01	.17507E-01	
12	.60000E+01	.24510E+04	.40605E+04	.12706E-01	.12043E-01	.26180E-01	.12484E-01	.17507E-01	.29004E-01	

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2	
13	.60000E+01	.40605E+06	.11214E+06	-.26180E-01	-.12484E-01	.79910E-02	-.54716E-03	.29004E-01	.80097E-02	
14	.60000E+01	.11214E+06	.80640E+06	-.79910E-02	.54716E-03	-.55998E-01	.13490E-01	.80097E-02	.57600E-01	
15	.60000E+01	.80640E+06	.13096E+05	.55998E-01	-.13490E-01	-.93280E-01	-.70476E-02	.57600E-01	.93546E-01	
16	.60000E+01	.13096E+05	.13201E+05	.93280E-01	.70476E-02	-.93520E-01	.12044E-01	.93546E-01	.94293E-01	
17	.60000E+01	.13201E+05	.56390E+05	.93520E-01	-.12044E-01	-.22290E+00	.33549E+00	.94293E-01	.40278E+00	Wheel 1
18	.60000E+01	.56390E+05	.55920E+04	.22290E+00	-.33549E+00	.38943E-01	-.88810E-02	.40278E+00	.39943E-01	Wheel 1
19	.60000E+01	.55920E+04	.75665E+04	-.38943E-01	.88810E-02	.42376E-01	.33546E-01	.39943E-01	.54047E-01	
20	.60000E+01	.75665E+04	.52264E+04	-.42376E-01	-.33546E-01	.36616E-01	.72713E-02	.54047E-01	.37331E-01	
21	.60000E+01	.52264E+04	.42341E+04	-.36616E-01	-.72713E-02	.22097E-01	-.20649E-01	.37331E-01	.30244E-01	
22	.60000E+01	.42341E+04	.13874E+04	-.22097E-01	.20649E-01	-.12559E-02	-.98301E-02	.30244E-01	.99100E-02	
23	.60000E+01	.13874E+04	.33913E+04	.12559E-02	.98301E-02	-.24025E-01	-.30963E-02	.99100E-02	.24223E-01	
24	.60000E+01	.33913E+04	.53303E+04	.24025E-01	.30963E-02	-.37672E-01	.55143E-02	.24223E-01	.38074E-01	
25	.60000E+01	.53303E+04	.60874E+04	.37672E-01	-.55143E-02	-.43430E-01	-.21048E-02	.38074E-01	.43481E-01	
26	.60000E+01	.60874E+04	.66936E+04	.43430E-01	.21048E-02	-.47573E-01	-.47723E-02	.43481E-01	.47812E-01	
27	.60000E+01	.66936E+04	.71772E+04	.47573E-01	.47723E-02	-.51211E-01	-.23736E-02	.47812E-01	.51266E-01	
28	.60000E+01	.71772E+04	.75180E+04	.51211E-01	.23736E-02	-.53691E-01	-.96867E-03	.51266E-01	.53700E-01	Ground
29	.60000E+01	.75180E+04	.77829E+04	.53691E-01	.96867E-03	-.55513E-01	-.29620E-02	.53700E-01	.55592E-01	
30	.60000E+01	.77829E+04	.79878E+04	.55513E-01	.29620E-02	-.56886E-01	-.43897E-02	.55592E-01	.57055E-01	Ground
31	.60000E+01	.79878E+04	.81726E+04	.56886E-01	.43897E-02	-.57967E-01	.68938E-02	.57055E-01	.58376E-01	Ground and Wheel 4
32	.60000E+01	.81726E+04	.82431E+04	.57967E-01	-.68938E-02	-.58831E-01	.23803E-02	.58376E-01	.58879E-01	Ground
33	.60000E+01	.82431E+04	.82665E+04	.58831E-01	-.23803E-02	-.59036E-01	-.11014E-02	.58879E-01	.59047E-01	
34	.60000E+01	.82665E+04	.79922E+04	.59036E-01	.11014E-02	-.56996E-01	-.32117E-02	.59047E-01	.57087E-01	Ground
35	.60000E+01	.79922E+04	.81532E+04	.56996E-01	.32117E-02	-.56013E-01	.15942E-01	.57087E-01	.58237E-01	Ground and Wheel 5
36	.60000E+01	.81532E+04	.80501E+04	.56013E-01	-.15942E-01	-.57480E-01	-.15466E-02	.58237E-01	.57501E-01	
37	.60000E+01	.80501E+04	.79947E+04	.57480E-01	.15466E-02	-.56925E-01	-.65299E-02	.57501E-01	.57105E-01	
38	.60000E+01	.79947E+04	.69457E+04	.56925E-01	.65299E-02	-.48266E-01	.11478E-01	.57105E-01	.49612E-01	
39	.60000E+01	.69457E+04	.76644E+04	.48266E-01	-.11478E-01	-.54703E-01	-.21527E-02	.49612E-01	.54746E-01	Ground and Wheel 6
40	.60000E+01	.76644E+04	.82930E+04	.54703E-01	.21527E-02	-.56631E-01	-.17375E-01	.54746E-01	.59236E-01	
41	.60000E+01	.82930E+04	.13750E+05	.56631E-01	.17375E-01	-.74265E-01	-.64271E-01	.59236E-01	.98215E-01	
42	.60000E+01	.13750E+05	.22923E+05	.74265E-01	.64271E-01	-.90899E-01	-.13619E+00	.98215E-01	.16374E+00	
43	.60000E+01	.22923E+05	.23699E+05	.90899E-01	.13619E+00	-.86702E-01	-.14539E+00	.16374E+00	.16928E+00	
44	.60000E+01	.23699E+05	.13809E+05	.86702E-01	.14539E+00	-.96840E-01	-.18721E-01	.16928E+00	.98633E-01	Wheel 7
45	.60000E+01	.13809E+05	.61154E+04	.96840E-01	.18721E-01	-.43319E-01	-.56151E-02	.98633E-01	.43681E-01	
46	.60000E+01	.61154E+04	.58649E+04	.43319E-01	.56151E-02	-.11053E-01	-.40408E-01	.43681E-01	.41892E-01	
47	.60000E+01	.58649E+04	.13964E+05	.11053E-01	.40408E-01	.65724E-02	-.99525E-01	.41892E-01	.99741E-01	
48	.60000E+01	.13964E+05	.85270E+04	-.65724E-02	.99525E-01	.11325E-01	-.59845E-01	.99741E-01	.60907E-01	
49	.60000E+01	.85270E+04	.47427E+04	-.11325E-01	.59845E-01	.10255E-01	-.32287E-01	.60907E-01	.33877E-01	
50	.60000E+01	.47427E+04	.18894E+04	-.10255E-01	.32287E-01	.13106E-01	-.32174E-02	.33877E-01	.13495E-01	
51	.60000E+01	.18894E+04	.35367E+04	-.13106E-01	.32174E-02	.80719E-02	-.23938E-01	.13495E-01	.25262E-01	
52	.60000E+01	.35367E+04	.12362E+04	-.80719E-02	.23938E-01	.72650E-02	-.50189E-02	.25262E-01	.88301E-02	Wheel 6
53	.60000E+01	.12362E+04	.38170E+04	-.72650E-02	.50189E-02	-.15214E-02	.27222E-01	.88301E-02	.27264E-01	Wheel 6
54	.60000E+01	.38170E+04	.19065E+04	.15214E-02	-.27222E-01	.11875E-01	.66650E-02	.27264E-01	.13618E-01	
55	.60000E+01	.19065E+04	.37966E+04	-.11875E-01	-.66650E-02	.27106E-01	-.81860E-03	.13618E-01	.27119E-01	
56	.60000E+01	.37966E+04	.55601E+04	-.27106E-01	.81860E-03	.32432E-01	-.22924E-01	.27119E-01	.39715E-01	
57	.60000E+01	.55601E+04	.70092E+04	-.32432E-01	.22924E-01	.49511E-01	.74373E-02	.39715E-01	.50066E-01	Wheel 5
58	.60000E+01	.70092E+04	.10829E+05	-.49511E-01	-.74373E-02	.77223E-01	.44901E-02	.50066E-01	.77353E-01	
59	.60000E+01	.10829E+05	.17787E+05	-.77223E-01	-.44901E-02	.12693E+00	.55710E-02	.77353E-01	.12705E+00	
60	.60000E+01	.17787E+05	.21383E+05	-.12693E+00	-.55710E-02	.15270E+00	-.32841E-02	.12705E+00	.15274E+00	

Cyc	Time	Time-Step	DW-RPM
41	.0041	.0001000	2.500
42	.0042	.0001000	2.500

TRV$_i$ Tracked Vehicle Dynamics - Version 1.00

43	.0043	.0001000	2.500
44	.0044	.0001000	2.500
45	.0045	.0001000	2.500
46	.0046	.0001000	2.500
47	.0047	.0001000	2.500
48	.0048	.0001000	2.500
49	.0049	.0001000	2.500
50	.0050	.0001000	2.500

OUTPUT AT TIME .0050

Displacements, Velocities, and Accelerations

	X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Vehicle	-.72025E+00	.24149E+02	-.54545E-05	-.16188E+03	.51977E+02	-.18967E-01	.12578E+04	.55040E+04	-.19486E+02
Wheel 1	-.74195E+02	.19733E+02	.78540E-01	.19082E+03	-.31906E+03	.15708E+02	-.11650E+06	.85454E+04	.00000E+00
Wheel 2	-.50496E+02	.14640E+02	.56980E-01	-.18343E+03	.57232E+02	.11396E+02	-.15762E+05	-.22006E+05	.00000E+00
Wheel 3	-.25725E+02	.14009E+02	.56980E-01	-.14593E+03	-.18057E+02	.11396E+02	.75229E+03	-.12729E+05	.00000E+00
Wheel 4	-.71138E+00	.13970E+02	.56980E-01	-.14761E+03	-.15831E+01	.11396E+02	-.29992E+03	-.13980E+05	.00000E+00
Wheel 5	.24504E+02	.13855E+02	.56980E-01	-.31138E+03	-.13992E+02	.11396E+02	.12889E+04	-.19778E+05	.00000E+00
Wheel 6	.49305E+02	.13745E+02	.56980E-01	-.11198E+03	.26315E+02	.11396E+02	.35618E+04	.40997E+05	.00000E+00
Wheel 7	.73326E+02	.13642E+02	.78540E-01	-.36871E+03	-.58333E+03	.15708E+02	.30674E+05	.94635E+05	.00000E+00
Link 1	-.13588E+01	.26718E+02	.31113E+01	-.29380E+03	.18395E+02	.51801E+00	.13766E+05	.66465E+04	.15378E+04
Link 2	-.74937E+01	.26952E+02	.30945E+01	-.30019E+03	.11962E+02	.66919E+00	-.24415E+05	.14946E+05	.92298E+03
Link 3	-.13634E+02	.27273E+02	.30839E+01	-.28319E+03	.52486E+01	.14855E+01	-.49646E+04	.49680E+04	.86373E+02
Link 4	-.19775E+02	.27623E+02	.30858E+01	-.27560E+03	-.45929E+01	.18132E+01	.61835E+05	-.10200E+05	.87530E+01
Link 5	-.25905E+02	.27831E+02	.31299E+01	-.30572E+03	.13213E+01	-.27739E+01	.13310E+06	-.58416E+04	-.12245E+04
Link 6	-.31989E+02	.27957E+02	.31125E+01	-.32478E+03	.19098E+02	-.17294E+01	.15355E+06	-.90754E+04	-.62680E+02
Link 7	-.38007E+02	.28286E+02	.30611E+01	-.31822E+03	.89910E+01	.33334E+01	.17268E+06	-.13329E+05	.32790E+03
Link 8	-.43960E+02	.28623E+02	.31082E+01	-.28158E+03	.64318E+01	-.23647E+01	.10062E+06	.62026E+04	.85807E+03
Link 9	-.49875E+02	.28975E+02	.30568E+01	-.25351E+03	.97662E+01	.35727E+01	.29806E+05	.89203E+03	-.24532E+04
Link 10	-.55779E+02	.29297E+02	.31185E+01	-.28651E+03	.12070E+02	-.48171E+01	-.80985E+04	-.59611E+04	.78703E+03
Link 11	-.61684E+02	.29644E+02	.30178E+01	-.29851E+03	-.12065E+02	.52912E+01	-.49727E+04	-.31427E+05	.24162E+03
Link 12	-.67592E+02	.29907E+02	-.31405E+01	-.20615E+03	-.21297E+02	-.48828E-02	.26888E+05	.50153E+05	.30945E+04
Link 13	-.73474E+02	.30177E+02	.30045E+01	-.75772E+02	-.72040E+02	.21988E+02	.12132E+05	.32846E+05	-.96710E+04
Link 14	-.79034E+02	.29399E+02	-.26768E+01	-.11586E+02	-.12914E+03	.52765E+01	-.11258E+06	.71130E+05	.39223E+04
Link 15	-.83333E+02	.25603E+02	-.21605E+01	.45594E+01	-.15883E+03	.26561E+02	-.10460E+06	-.69245E+05	.42472E+04
Link 16	-.86374E+02	.20191E+02	-.13646E+01	.17355E+03	-.16324E+03	.43425E+02	.67616E+05	-.28434E+05	.84331E+04
Link 17	-.81863E+02	.14906E+02	-.90280E-00	.20845E+03	-.10856E+03	.44851E+01	.21658E+05	-.56856E+06	.12136E+05
Link 18	-.77107E+02	.11192E+02	-.42112E+00	-.94196E+01	-.25427E+03	-.12319E+03	-.94193E+06	-.10994E+07	.69372E+04
Link 19	-.71481E+02	.91639E+01	-.28273E+00	-.65463E+02	-.45839E+03	.38610E+02	-.30407E+05	.12187E+05	.71552E+04
Link 20	-.65774E+02	.73734E+01	-.33759E+00	.22346E+02	-.25001E+03	.15398E+02	-.26658E+05	-.83362E+05	.83910E+04
Link 21	-.60229E+02	.51420E+01	-.42865E+00	.65131E+02	-.16133E+03	.19502E+01	-.22037E+05	-.44748E+05	-.11709E+04
Link 22	-.54831E+02	.25632E+01	-.45731E+00	.11766E+03	-.95677E+02	.26109E+02	-.43222E+04	.23717E+05	-.59785E+04
Link 23	-.49164E+02	.12941E+01	.17979E-01	.14508E+03	.18853E+01	.14687E+02	.31184E+05	-.24499E+04	-.17188E+03
Link 24	-.43178E+02	.14298E+01	.26927E-01	.11189E+03	.26698E+02	-.49585E+01	.53870E+05	.86798E+03	.13665E+04
Link 25	-.37176E+02	.13586E+01	-.51120E-01	.76129E+02	.21257E+02	.30501E+00	.44077E+05	-.12156E+05	-.37407E+03
Link 26	-.31156E+02	.12545E+01	.17382E-01	.46991E+02	.20022E+01	-.78551E+01	.23961E+05	.53066E+04	-.34714E+03
Link 27	-.25124E+02	.12679E+01	-.19274E-01	.31310E+02	-.22785E+02	.28192E+01	.16462E+05	.20307E+05	.86012E+03
Link 28	-.19086E+02	.12373E+01	.13966E-01	.19067E+02	-.18585E+01	.39138E+01	.16339E+05	.66535E+04	.37239E+03
Link 29	-.13042E+02	.12724E+01	-.18528E-02	.85735E+01	.13125E+02	.96872E+00	.12863E+05	.15732E+05	.79130E+03
Link 30	-.69920E+01	.12473E+01	-.81189E-02	.67006E+00	.87492E+01	-.10090E+01	.76714E+04	.14663E+05	.29313E+04
Link 31	-.93956E+00	.12226E+01	-.29105E-02	-.51633E+01	.71141E+01	.91494E-01	.33244E+04	.16538E+05	.73552E+03
Link 32	.51140E+01	.12480E+01	.13019E-01	-.10529E+02	.10455E+02	.10284E+00	-.58465E+03	.11339E+05	-.16876E+04
Link 33	.11167E+02	.12670E+01	-.60500E-02	-.17433E+02	.16370E+02	-.14129E+00	-.36640E+04	.23898E+05	.10841E+04
Link 34	.17219E+02	.12420E+01	-.46598E-02	-.24380E+02	.99191E+01	-.28780E+01	-.18232E+04	.26264E+05	.40147E+04
Link 35	.23271E+02	.11947E+01	-.14858E-01	-.29320E+02	.55544E+01	.10948E+01	-.29107E+04	.36052E+04	.11954E+04
Link 36	.29320E+02	.12786E+01	.44842E-01	-.32591E+02	.15771E+02	-.13800E+01	-.64556E+04	-.95237E+03	-.51837E+04
Link 37	.35366E+02	.13185E+01	-.29509E-01	-.42004E+02	.61361E+01	.35092E+01	-.37401E+04	-.12996E+05	-.34382E+04
Link 38	.41410E+02	.13533E+01	.44737E-01	-.40965E+02	-.22574E+02	-.11776E+02	.21291E+05	.28782E+05	-.19059E+04
Link 39	.47450E+02	.11981E+01	-.96616E-01	-.22272E+02	.15934E+02	.92864E+01	.35629E+05	.73053E+05	.90733E+04
Link 40	.53455E+02	.15316E+01	.19657E+00	.15014E+02	.60947E+02	-.38051E+01	.53214E+05	.10798E+06	.15724E+05
Link 41	.59351E+02	.31074E+01	.30909E+00	.73163E+02	.53375E+01	-.10158E+02	.14560E+05	-.12049E+05	.17090E+05
Link 42	.65310E+02	.41839E+01	.30323E-01	.11010E+03	-.10994E+03	.80045E+01	-.22925E+05	-.14291E+06	.15670E+05

Displacements, Velocities, and Accelerations

	X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Link 43	.71382E+02	.46331E+01	.11306E+00	.10151E+03	-.33563E+03	-.27807E+02	-.80559E+05	-.97304E+05	.69983E+04
Link 44	.72371E+02	.55790E+01	.20127E+00	.37395E+02	-.38694E+03	.68439E+02	.66198E+06	-.15228E+07	-.31010E+03
Link 45	.81545E+02	.89503E+01	.11545E+01	-.19857E+03	-.17683E+03	.47800E+02	-.71050E+05	-.11907E+06	-.26552E+04
Link 46	.82662E+02	.14676E+02	.16009E+01	-.61838E+03	-.14097E+03	.19615E+02	-.99753E+04	-.16875E+06	.45665E+04
Link 47	.80890E+02	.20087E+02	.21620E+01	-.68853E+03	-.18069E+03	.12710E+02	.14076E+05	-.11858E+05	.19146E+05
Link 48	.76435E+02	.23625E+02	.27553E+01	-.46646E+03	-.24654E+03	-.25141E+02	.29362E+05	.20936E+06	.16381E+05
Link 49	.70663E+02	.24729E+02	-.31345E+01	-.41025E+03	-.15892E+03	-.52297E+02	.61946E+05	.78914E+05	-.15610E+04
Link 50	.66718E+02	.25121E+02	.30116E+01	-.37104E+03	-.57049E+02	-.89411E+01	.77330E+05	.10402E+04	-.14299E+05
Link 51	.58802E+02	.25519E+02	-.31365E+01	-.31109E+03	.56044E+02	-.31436E+02	.42998E+05	-.89932E+05	-.83855E+03
Link 52	.52918E+02	.25996E+02	.29741E+01	-.25206E+03	.90424E+02	.12810E+02	-.11822E+05	.42543E+03	-.34673E+04
Link 53	.47034E+02	.26335E+02	-.30907E+01	-.22352E+03	.67068E+02	-.30156E+01	-.10023E+06	.59946E+05	.32481E+03
Link 54	.41087E+02	.25888E+02	-.30387E+01	-.19099E+03	.10564E+03	-.18345E+01	-.86912E+05	-.27860E+05	-.26453E+04
Link 55	.35113E+02	.25828E+02	.30603E+01	-.16892E+03	.94949E+02	.13552E+02	-.64989E+05	.14117E+05	-.36330E+04
Link 56	.29100E+02	.25996E+02	-.31131E+01	-.18083E+03	.99178E+02	-.12985E+02	-.93401E+05	.14655E+05	-.35002E+04
Link 57	.23097E+02	.26489E+02	.29524E+01	-.22642E+03	.65876E+02	.16567E+02	-.99329E+05	-.27808E+04	.40140E+04
Link 58	.17060E+02	.26941E+02	-.31084E+01	-.28517E+03	.21026E+02	.30125E+01	-.11109E+06	.21208E+05	.21229E+04
Link 59	.10930E+02	.26724E+02	-.31042E+01	-.32580E+03	.79595E+01	-.19448E+01	-.37258E+05	.15067E+05	-.11130E+04
Link 60	.47866E+01	.26620E+02	.31391E+01	-.31623E+03	.16278E+02	-.10578E+00	.69183E+04	-.51413E+04	.85820E+02

Forces and Moments

	FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Vehicle	.32553E+05	.14244E+06	-.24942E+07						
Wheel 1	-.36114E+05	.26491E+04	.00000E+00						
Wheel 2	-.18283E+04	-.25527E+04	.00000E+00						
Wheel 3	.87265E+02	-.14766E+04	.00000E+00						
Wheel 4	-.34790E+02	-.16217E+04	.00000E+00						
Wheel 5	.14951E+03	-.22943E+04	.00000E+00						
Wheel 6	.41085E+03	.47557E+04	.00000E+00						
Wheel 7	.95090E+04	.29337E+05	.00000E+00						
Link 1	.00000E+00	-.20093E+02	.00000E+00	.20268E+05	.11462E+03	-.19552E+05	.24069E+03	.10996E+02	-.26680E+02
Link 2	.00000E+00	-.20093E+02	.00000E+00	.19552E+05	-.24069E+03	-.20822E+05	.10380E+04	.26680E+02	.45049E+02
Link 3	.00000E+00	-.20093E+02	.00000E+00	.20822E+05	-.10380E+04	-.21080E+05	.13164E+04	-.45049E+02	.31256E+02
Link 4	.00000E+00	-.20093E+02	.00000E+00	.21080E+05	-.13164E+04	-.18905E+05	.80611E+03	-.31256E+02	-.27891E+03
Link 5	.00000E+00	-.20093E+02	.00000E+00	.18905E+05	-.80611E+03	-.11984E+05	.52244E+03	.27891E+03	.47196E+02
Link 6	.00000E+00	-.20093E+02	.00000E+00	.11984E+05	-.52244E+03	-.39989E+04	.70608E+02	-.47196E+02	.30149E+03
Link 7	.00000E+00	-.20093E+02	.00000E+00	.39989E+04	-.70608E+02	.49803E+04	-.60240E+03	-.30149E+03	-.36344E+03
Link 8	.00000E+00	-.20093E+02	.00000E+00	-.49803E+04	.60240E+03	.10212E+05	-.25977E+03	.36344E+03	.37356E+03
Link 9	.00000E+00	-.20093E+02	.00000E+00	-.10212E+05	.25977E+03	.11762E+05	-.19329E+03	-.37356E+03	-.55245E+03
Link 10	.00000E+00	-.20093E+02	.00000E+00	-.11762E+05	.19329E+03	.11341E+05	-.48318E+03	.55245E+03	.67354E+03
Link 11	.00000E+00	-.20093E+02	.00000E+00	-.11341E+05	.48318E+03	.11083E+05	-.20973E+04	-.67354E+03	-.22332E+03
Link 12	.00000E+00	-.20093E+02	.00000E+00	-.11083E+05	.20973E+04	.12481E+05	.53081E+03	.22332E+03	.15007E+04
Link 13	.00000E+00	-.20093E+02	.00000E+00	-.12481E+05	.53081E+03	.13112E+05	.22589E+04	-.15007E+04	-.27281E+02
Link 14	.00000E+00	-.20093E+02	.00000E+00	-.13112E+05	-.22589E+04	.72575E+04	.59778E+04	.27281E+02	.29084E+04
Link 15	.00000E+00	-.20093E+02	.00000E+00	-.72575E+04	-.59778E+04	.18181E+04	.23971E+04	-.29084E+04	.31707E+04
Link 16	.00000E+00	-.20093E+02	.00000E+00	-.18181E+04	-.23971E+04	.53341E+04	.93864E+03	-.31707E+04	-.21704E+04
Link 17	-.15995E+05	-.10089E+05	.00000E+00	-.53341E+04	-.93864E+03	.22455E+05	-.18538E+05	.21704E+04	-.94289E+04
Link 18	-.27489E+05	-.80654E+05	.00000E+00	-.22455E+05	.18538E+05	.96322E+03	.49487E+04	.94289E+04	.13626E+05
Link 19	.00000E+00	-.20093E+02	.00000E+00	-.96322E+03	-.49487E+04	-.61795E+03	.56025E+04	-.13626E+05	-.20333E+04
Link 20	.00000E+00	-.20093E+02	.00000E+00	.61795E+03	-.56025E+04	-.20041E+04	.12878E+04	.20333E+04	-.13108E+04
Link 21	.00000E+00	-.20093E+02	.00000E+00	.20041E+04	-.12878E+04	-.31501E+04	-.10190E+04	.13108E+04	.19242E+04
Link 22	.00000E+00	-.20093E+02	.00000E+00	.31501E+04	.10190E+04	-.33748E+04	.23433E+03	-.19242E+04	.12458E+03
Link 23	.00000E+00	-.20093E+02	.00000E+00	.33748E+04	-.23433E+03	-.17533E+04	.12703E+03	-.12458E+03	-.15968E+04

Forces and Moments

	FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Link 24	.000000E+00	-.20093E+02	.00000E+00	.17533E+04	-.12703E+03	.10480E+04	.19226E+03	.15968E+04	.25838E+03
Link 25	.000000E+00	-.20093E+02	.00000E+00	-.10480E+04	-.19226E+03	.33400E+04	-.41977E+03	-.25838E+03	-.51815E+03
Link 26	.000000E+00	-.20093E+02	.00000E+00	-.33400E+04	.41977E+03	.45860E+04	-.12374E+03	.51815E+03	.79642E+03
Link 27	.000000E+00	.18895E+03	.00000E+00	-.45860E+04	.12374E+03	.54420E+04	.74329E+03	-.79642E+03	.16454E+03
Link 28	.000000E+00	.12501E+04	.00000E+00	-.54420E+04	-.74329E+03	.62916E+04	-.17124E+03	-.16454E+03	-.27782E+03
Link 29	.000000E+00	-.20093E+02	.00000E+00	-.62916E+04	.17124E+03	.69605E+04	.66693E+03	.27782E+03	-.17681E+03
Link 30	.000000E+00	.253666E+03	.00000E+00	-.69605E+04	-.66693E+03	.73594E+04	.11757E+04	.17681E+03	.10224E+03
Link 31	-.82071E-01	.27180E+04	.00000E+00	-.73594E+04	-.11757E+04	.75323E+04	-.68234E+03	-.10224E+03	.36616E+02
Link 32	.000000E+00	.17748E+03	.00000E+00	-.75323E+04	.68234E+03	.75019E+04	-.27019E+03	-.36616E+02	-.62808E+02
Link 33	.000000E+00	-.20093E+02	.00000E+00	-.75019E+04	.27019E+03	.73114E+04	.99258E+03	.62808E+02	-.22213E+03
Link 34	.000000E+00	.78373E+03	.00000E+00	-.73114E+04	-.99258E+03	.72166E+04	.15746E+04	.22213E+03	.30413E+03
Link 35	-.28482E+03	.25915E+04	.00000E+00	-.72166E+04	-.15746E+04	.73501E+04	-.82943E+03	-.30413E+03	-.69960E+02
Link 36	.000000E+00	-.20093E+02	.00000E+00	-.73501E+04	.82943E+03	.70144E+04	-.85886E+03	.69960E+02	.23585E+03
Link 37	.000000E+00	-.20093E+02	.00000E+00	-.70144E+04	.85886E+03	.68199E+04	-.15145E+04	-.23585E+03	-.10917E+04
Link 38	.000000E+00	-.20093E+02	.00000E+00	-.68199E+04	.15145E+04	.79270E+04	.21893E+01	.10917E+04	.14169E+04
Link 39	-.96929E+03	-.13833E+04	.00000E+00	- 270E+04	-.21893E+01	.10749E+05	.51842E+04	-.14169E+04	-.42074E+03
Link 40	.000000E+00	-.20093E+02	.00000E+00	-.10749E+05	-.51842E+04	.13516E+05	.10820E+05	.42074E+03	-.27084E+03
Link 41	.000000E+00	-.20093E+02	.00000E+00	-.13516E+05	-.10820E+05	.14273E+05	.10213E+05	.27084E+03	.87043E+03
Link 42	.000000E+00	-.20093E+02	.00000E+00	-.14273E+05	-.10213E+05	.13081E+05	.28020E+04	-.87043E+03	-.27620E+04
Link 43	-.71015E+03	-.33113E+04	.00000E+00	-.13081E+05	-.28020E+04	.96023E+04	.10535E+04	.27620E+04	.81189E+04
Link 44	.41135E+05	-.82018E+05	.00000E+00	-.96023E+04	-.10535E+04	.28902E+04	.38874E+04	-.81189E+04	.43653E+03
Link 45	.000000E+00	-.20093E+02	.00000E+00	-.28902E+04	-.38874E+04	-.80442E+03	-.22841E+04	-.43653E+03	-.13198E+04
Link 46	.000000E+00	-.20093E+02	.00000E+00	.80442E+03	.22841E+04	-.13231E+04	-.11039E+05	.13198E+04	.68869E+03
Link 47	.000000E+00	-.20093E+02	.00000E+00	.13231E+04	.11039E+05	-.59121E+03	-.11635E+05	-.68869E+03	-.17864E+04
Link 48	.000000E+00	-.20093E+02	.00000E+00	.59121E+03	.11635E+05	.93560E+03	-.72825E+03	.17864E+04	-.13538E+04
Link 49	.000000E+00	-.20093E+02	.00000E+00	-.93560E+03	.72825E+03	.41568E+04	.33954E+04	.13538E+04	.32614E+04
Link 50	.000000E+00	-.20093E+02	.00000E+00	-.41568E+04	-.33954E+04	.81780E+04	.34696E+04	-.32614E+04	-.15489E+04
Link 51	.000000E+00	-.20093E+02	.00000E+00	-.81780E+04	-.34696E+04	.10414E+05	-.11868E+04	.15489E+04	.32550E+04
Link 52	.000000E+00	-.20093E+02	.00000E+00	-.10414E+05	.11868E+04	.97991E+04	-.11446E+04	-.32550E+04	-.81331E+03
Link 53	.000000E+00	-.20093E+02	.00000E+00	-.97991E+04	.11446E+04	.45869E+04	.19927E+04	.81331E+03	.21370E+03
Link 54	.000000E+00	-.20093E+02	.00000E+00	-.45869E+04	-.19927E+04	.67508E+02	.56403E+03	-.21370E+03	.85372E+03
Link 55	.000000E+00	-.20093E+02	.00000E+00	-.67508E+02	-.56403E+03	-.33119E+04	.13182E+04	-.85372E+03	-.19381E+04
Link 56	.000000E+00	-.20093E+02	.00000E+00	.33119E+04	-.13182E+04	-.81688E+04	.21004E+04	.19381E+04	.19446E+04
Link 57	-.42006E+03	.37497E+04	.00000E+00	.81688E+04	-.21004E+04	-.12914E+05	-.17939E+04	-.19446E+04	-.61734E+03
Link 58	.000000E+00	-.20093E+02	.00000E+00	.12914E+05	.17939E+04	-.18691E+05	-.67096E+03	.61734E+03	-.39866E+03
Link 59	.000000E+00	-.20093E+02	.00000E+00	.18691E+05	.67096E+03	-.20628E+05	.13264E+03	.39866E+03	.61954E+02
Link 60	.000000E+00	-.20093E+02	.00000E+00	.20628E+05	-.13264E+03	-.20268E+05	-.11462E+03	-.61954E+02	-.10996E+02

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2
1	.60000E+01	.20269E+05	.19554E+05	-.14477E+00	-.81870E-03	.13966E+00	-.17192E-02	.14478E+00	.13967E+00
2	.60000E+01	.19554E+05	.20848E+05	-.13966E+00	.17192E-02	.14873E+00	-.74143E-02	.13967E+00	.14891E+00
3	.60000E+01	.20848E+05	.21121E+05	-.14873E+00	.74143E-02	.15057E+00	-.94031E-02	.14891E+00	.15087E+00
4	.60000E+01	.21121E+05	.18922E+05	-.15057E+00	.94031E-02	.13503E+00	-.57579E-02	.15087E+00	.13516E+00
5	.60000E+01	.18922E+05	.11995E+05	-.13503E+00	.57579E-02	.85597E-01	-.37317E-02	.13516E+00	.85678E-01
6	.60000E+01	.11995E+05	.39995E+04	-.85597E-01	.37317E-02	.28563E-01	-.50435E-03	.85678E-01	.28568E-01
7	.60000E+01	.39995E+04	.50166E+04	-.28563E-01	.50435E-03	-.35574E-01	.43029E-02	.28568E-01	.35833E-01
8	.60000E+01	.50166E+04	.10216E+05	.35574E-01	-.43029E-02	-.72946E-01	.18555E-02	.35833E-01	.72970E-01
9	.60000E+01	.10216E+05	.11764E+05	.72946E-01	-.18555E-02	-.84017E-01	.13807E-02	.72970E-01	.84028E-01
10	.60000E+01	.11764E+05	.11352E+05	.84017E-01	-.13807E-02	-.81009E-01	.34513E-02	.84028E-01	.81082E-01
11	.60000E+01	.11352E+05	.11279E+05	.81009E-01	-.34513E-02	-.79162E-01	.14980E-01	.81082E-01	.80567E-01
12	.60000E+01	.11279E+05	.12492E+05	.79162E-01	-.14980E-01	-.89149E-01	-.37915E-02	.80567E-01	.89229E-01

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2	
13	.60000E+01	.12492E+05	.13305E+05	.89149E-01	.37915E-02	-.93655E-01	-.16135E-01	.89229E-01	.95035E-01	
14	.60000E+01	.13305E+05	.94024E+04	.93655E-01	.16135E-01	-.51839E-01	-.42698E-01	.95035E-01	.67160E-01	
15	.60000E+01	.94024E+04	.30086E+04	.51839E-01	.42698E-01	-.12986E-01	-.17122E-01	.67160E-01	.21490E-01	
16	.60000E+01	.30086E+04	.54160E+04	.12986E-01	.17122E-01	-.38101E-01	-.67046E-02	.21490E-01	.38686E-01	
17	.60000E+01	.54160E+04	.29119E+05	.38101E-01	.67046E-02	-.16039E+00	.13242E+00	.38686E-01	.20799E+00	Wheel 1
18	.60000E+01	.29119E+05	.50416E+04	.16039E+00	-.13242E+00	-.68801E-02	-.35348E-01	.20799E+00	.36011E-01	Wheel 1
19	.60000E+01	.50416E+04	.56365E+04	.68801E-02	.35348E-01	.64139E-02	-.40018E-01	.36011E-01	.40260E-01	
20	.60000E+01	.56365E+04	.23822E+04	-.64139E-02	.40018E-01	.14315E-01	-.91983E-02	.40260E-01	.17016E-01	
21	.60000E+01	.23822E+04	.33108E+04	-.14315E-01	.91983E-02	.22501E-01	.72788E-02	.17016E-01	.23649E-01	
22	.60000E+01	.33108E+04	.33830E+04	-.22501E-01	-.72788E-02	.24106E-01	-.16738E-02	.23649E-01	.24164E-01	
23	.60000E+01	.33830E+04	.17579E+04	-.24106E-01	.16738E-02	.12523E-01	-.90735E-03	.24164E-01	.12556E-01	
24	.60000E+01	.17579E+04	.10655E+04	-.12523E-01	.90735E-03	-.74856E-02	-.13733E-02	.12556E-01	.76105E-02	
25	.60000E+01	.10655E+04	.33662E+04	.74856E-02	.13733E-02	-.23857E-01	.29984E-02	.76105E-02	.24045E-01	
26	.60000E+01	.33662E+04	.45876E+04	.23857E-01	-.29984E-02	-.32757E-01	.88383E-03	.24045E-01	.32769E-01	
27	.60000E+01	.45876E+04	.54925E+04	.32757E-01	-.88383E-03	-.38871E-01	-.53092E-02	.32769E-01	.39232E-01	Ground
28	.60000E+01	.54925E+04	.62939E+04	.38871E-01	.53092E-02	-.44940E-01	-.12232E-02	.39232E-01	.44957E-01	Ground
29	.60000E+01	.62939E+04	.69923E+04	.44940E-01	-.12232E-02	-.49718E-01	-.47638E-02	.44957E-01	.49945E-01	
30	.60000E+01	.69923E+04	.74527E+04	.49718E-01	.47638E-02	-.52567E-01	-.83982E-02	.49945E-01	.53234E-01	Ground
31	.60000E+01	.74527E+04	.75632E+04	.52567E-01	.83982E-02	-.53802E-01	.48739E-02	.53234E-01	.54023E-01	Ground and Wheel 4
32	.60000E+01	.75632E+04	.75068E+04	.53802E-01	-.48739E-02	-.53585E-01	.19299E-02	.54023E-01	.53620E-01	Ground
33	.60000E+01	.75068E+04	.73785E+04	.53585E-01	-.19299E-02	-.52224E-01	-.70899E-02	.53620E-01	.52703E-01	
34	.60000E+01	.73785E+04	.73864E+04	.52224E-01	.70899E-02	-.51547E-01	-.11247E-01	.52703E-01	.52760E-01	Ground
35	.60000E+01	.73864E+04	.73967E+04	.51547E-01	.11247E-01	-.52500E-01	.59245E-02	.52760E-01	.52834E-01	Ground and Wheel 5
36	.60000E+01	.73967E+04	.70667E+04	.52500E-01	-.59245E-02	-.50103E-01	.61347E-02	.52834E-01	.50477E-01	
37	.60000E+01	.70667E+04	.69860E+04	.50103E-01	-.61347E-02	-.48713E-01	.10818E-01	.50477E-01	.49900E-01	
38	.60000E+01	.69860E+04	.79270E+04	.48713E-01	-.10818E-01	-.56622E-01	-.15638E-04	.49900E-01	.56622E-01	
39	.60000E+01	.79270E+04	.11934E+05	.56622E-01	.15638E-04	-.76779E-01	-.37030E-01	.56622E-01	.85242E-01	Ground and Wheel 6
40	.60000E+01	.11934E+05	.17313E+05	.76779E-01	.37030E-01	-.96544E-01	-.77282E-01	.85242E-01	.12367E+00	
41	.60000E+01	.17313E+05	.17551E+05	.96544E-01	.77282E-01	-.10195E+00	-.72950E-01	.12367E+00	.12536E+00	
42	.60000E+01	.17551E+05	.13378E+05	.10195E+00	.72950E-01	-.93437E-01	-.20014E-01	.12536E+00	.95557E-01	
43	.60000E+01	.13378E+05	.96599E+04	.93437E-01	.20014E-01	-.68588E-01	-.75253E-02	.95557E-01	.68999E-01	Wheel 7
44	.60000E+01	.96599E+04	.68440E+04	.68588E-01	.75253E-02	-.20644E-01	-.27767E-01	.68999E-01	.34600E-01	Wheel 7
45	.60000E+01	.68440E+04	.24216E+04	.20644E-01	.27767E-01	.57459E-02	.16315E-01	.34600E-01	.17297E-01	
46	.60000E+01	.24216E+04	.11118E+05	-.57459E-02	-.16315E-01	.94510E-02	.78848E-01	.17297E-01	.79413E-01	
47	.60000E+01	.11118E+05	.11650E+05	-.94510E-02	-.78848E-01	.42229E-02	.83109E-01	.79413E-01	.83216E-01	
48	.60000E+01	.11650E+05	.11856E+04	-.42229E-02	-.83109E-01	-.66828E-02	.52018E-02	.83216E-01	.84687E-02	
49	.60000E+01	.11856E+04	.53673E+04	.66828E-02	-.52018E-02	-.29691E-01	-.24253E-01	.84687E-02	.38338E-01	
50	.60000E+01	.53673E+04	.88835E+04	.29691E-01	.24253E-01	-.58414E-01	-.24783E-01	.38338E-01	.63454E-01	
51	.60000E+01	.88835E+04	.10481E+05	.58414E-01	.24783E-01	-.74385E-01	.84774E-02	.63454E-01	.74866E-01	
52	.60000E+01	.10481E+05	.98658E+04	.74385E-01	-.84774E-02	-.69994E-01	.81758E-02	.74866E-01	.70470E-01	
53	.60000E+01	.98658E+04	.50011E+04	.69994E-01	-.81758E-02	-.32764E-01	-.14233E-01	.70470E-01	.35722E-01	
54	.60000E+01	.50011E+04	.56805E+03	.32764E-01	.14233E-01	-.48220E-03	-.40288E-02	.35722E-01	.40575E-02	
55	.60000E+01	.56805E+03	.35646E+04	.48220E-03	.40288E-02	.23657E-01	-.94158E-02	.40575E-02	.25462E-01	
56	.60000E+01	.35646E+04	.84345E+04	-.23657E-01	.94158E-02	.58348E-01	-.15003E-01	.25462E-01	.60246E-01	
57	.60000E+01	.84345E+04	.13038E+05	-.58348E-01	.15003E-01	.92242E-01	.12813E-01	.60246E-01	.93127E-01	Wheel 5
58	.60000E+01	.13038E+05	.18703E+05	-.92242E-01	-.12813E-01	.13350E+00	.47926E-02	.93127E-01	.13359E+00	
59	.60000E+01	.18703E+05	.20628E+05	-.13350E+00	-.47926E-02	.14734E+00	-.94741E-03	.13359E+00	.14735E+00	
60	.60000E+01	.20628E+05	.20269E+05	-.14734E+00	.94741E-03	.14477E+00	.81870E-03	.14735E+00	.14478E+00	

Cyc	Time	Time-Step	DW-RPM
51	.0051	.0001000	2.500
52	.0052	.0001000	2.500

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53	.0053	.0001000	2.500
54	.0054	.0001000	2.500
55	.0055	.0001000	2.500
56	.0056	.0001000	2.500
57	.0057	.0001000	2.500
58	.0058	.0001000	2.500
59	.0059	.0001000	2.500
60	.0060	.0001000	2.500

OUTPUT AT TIME .0060

Displacements, Velocities, and Accelerations

	X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Vehicle	-.86149E+00	.24204E+02	-.35136E-04	-.14057E+03	.56670E+02	-.41414E-01	.13719E+04	.37850E+04	-.25219E+02
Wheel 1	-.74036E+02	.19436E+02	.94248E-01	.12314E+03	-.28038E+03	.15708E+02	-.81806E+05	.33643E+05	.00000E+00
Wheel 2	-.50687E+02	.14686E+02	.68376E-01	-.19680E+03	.36299E+02	.11396E+02	-.10308E+05	-.19658E+05	.00000E+00
Wheel 3	-.25871E+02	.13985E+02	.68376E-01	-.14503E+03	-.29943E+02	.11396E+02	.10910E+04	-.10896E+05	.00000E+00
Wheel 4	-.85903E+00	.13964E+02	.68376E-01	-.14758E+03	-.82252E+01	.11396E+02	.40193E+03	.30687E+04	.00000E+00
Wheel 5	.24195E+02	.13845E+02	.68376E-01	-.30501E+03	.53823E+01	.11396E+02	.13450E+05	.42853E+05	.00000E+00
Wheel 6	.49195E+02	.13792E+02	.68376E-01	-.10969E+03	.67480E+02	.11396E+02	-.67640E+02	.35771E+05	.00000E+00
Wheel 7	.72984E+02	.13123E+02	.94248E-01	-.29867E+03	-.42541E+03	.15708E+02	.17147E+06	.43821E+06	.00000E+00
Link 1	-.16588E+01	.26738E+02	.31123E+01	-.30894E+03	.21812E+02	.11126E+01	-.17266E+05	.62586E+04	-.21961E+03
Link 2	-.77936E+01	.26970E+02	.30956E+01	-.29416E+03	.19501E+02	.13861E+01	.15770E+05	-.18020E+04	.34632E+03
Link 3	-.13919E+02	.27281E+02	.30856E+01	-.28238E+03	.79958E+01	.19274E+01	.18766E+05	-.19583E+03	.81426E+03
Link 4	-.20037E+02	.27616E+02	.30878E+01	-.24867E+03	-.78031E+01	.18373E+01	.40678E+05	.25508E+03	.23329E+03
Link 5	-.26143E+02	.27829E+02	.31264E+01	-.19092E+03	-.60700E+01	-.39935E+01	.88723E+05	-.84836E+04	-.75316E+03
Link 6	-.32220E+02	.27969E+02	.31109E+01	-.15418E+03	.67129E+01	-.15886E+01	.15590E+06	-.68113E+04	.15187E+03
Link 7	-.38230E+02	.28292E+02	.30645E+01	-.15454E+03	.64716E+01	.32311E+01	.12762E+06	.15086E+04	-.58651E+03
Link 8	-.44193E+02	.28631E+02	.31060E+01	-.19755E+03	.62352E+01	-.22056E+01	.69723E+05	-.10723E+05	.16855E+03
Link 9	-.50128E+02	.28981E+02	.30594E+01	-.24927E+03	.80461E+00	.21521E+01	.36568E+05	-.12967E+05	-.45844E+02
Link 10	-.56050E+02	.29299E+02	.31150E+01	-.24269E+03	-.39887E+01	-.21684E+01	.94040E+05	-.39380E+04	.27314E+04
Link 11	-.61936E+02	.29637E+02	.30527E+01	-.19478E+03	.71083E+01	.38234E+01	.13654E+06	.37438E+05	-.39247E+04
Link 12	-.67772E+02	.29904E+02	-.31401E+01	-.16311E+03	.37170E+01	-.31025E-01	.18156E+05	.61302E+04	-.19525E+04
Link 13	-.73591E+02	.30271E+02	.30198E+01	-.17647E+03	-.24584E+02	.96137E+01	-.15842E+06	.43677E+05	-.11864E+05
Link 14	-.79142E+02	.29295E+02	-.26701E+01	-.18813E+03	-.93404E+02	.81499E+01	-.16061E+06	.80223E+04	.46542E+04
Link 15	-.83375E+02	.25422E+02	-.21336E+01	-.91945E+02	-.18285E+03	.26158E+02	-.15879E+06	.29661E+05	-.33631E+04
Link 16	-.84263E+02	.20012E+02	-.13245E+01	-.90906E+01	-.18898E+03	.31233E+02	-.32161E+06	-.15118E+05	-.28345E+05
Link 17	-.81789E+02	.14798E+02	-.89304E+00	.65658E+02	-.10739E+03	.13949E+02	-.32431E+05	-.65350E+06	.11354E+05
Link 18	-.77116E+02	.10941E+02	-.53237E+00	-.86830E+01	-.22967E+03	-.96921E+02	-.79294E+06	-.97914E+06	.36947E+05
Link 19	-.71571E+02	.87142E+01	-.23883E+00	-.11074E+03	-.44096E+03	.46965E+02	-.40030E+05	.33342E+05	.12832E+04
Link 20	-.65774E+02	.70919E+01	-.31537E+00	-.22157E+02	-.29068E+03	.27758E+02	-.54663E+05	.11866E+05	.10055E+05
Link 21	-.60178E+02	.49675E+01	-.42476E+00	.37548E+02	-.21542E+03	.70685E+01	-.32102E+05	-.20920E+05	.89626E+04
Link 22	-.54725E+02	.24651E+01	-.43374E+00	.93695E+02	-.11119E+03	.22679E+02	-.31698E+05	-.43015E+05	.69232E+03
Link 23	-.49018E+02	.12990E+01	.31922E-01	.13785E+03	.65949E+01	.13215E+02	-.31403E+05	-.37977E+04	-.12322E+04
Link 24	-.43045E+02	.14604E+01	.22659E-01	.14117E+03	.34067E+02	-.38763E+01	.19654E+04	.53044E+04	.48552E+03
Link 25	-.37075E+02	.13758E+01	-.50809E-01	.12160E+03	.17566E+02	.32565E+00	.39747E+05	.80290E+04	-.12966E+03
Link 26	-.31089E+02	.12553E+01	.96449E-02	.88377E+02	.27471E-01	-.72296E+01	.51616E+05	.21269E+04	.19591E+04
Link 27	-.25080E+02	.12392E+01	-.16295E-01	.58717E+02	-.13170E+01	.30227E+01	.38867E+05	.42269E+04	.13018E+03
Link 28	-.19057E+02	.12617E+01	.17849E-01	.38686E+02	.10964E+02	.35599E+01	.24086E+05	.16211E+05	-.13355E+04
Link 29	-.13025E+02	.12905E+01	-.71548E-03	.24004E+02	.20205E+02	.10412E+01	.17166E+05	.32196E+04	-.68535E+03
Link 30	-.69860E+01	.12631E+01	-.79841E-02	.11078E+02	.20431E+02	.60946E+00	.12065E+05	.55613E+04	.89063E+02
Link 31	-.94258E+00	.12328E+01	-.24068E-02	-.92247E+00	.10322E+02	.77317E+00	.55652E+04	-.22999E+04	.39562E+03
Link 32	.51028E+01	.12648E+01	.12738E-01	-.11383E+02	.21631E+02	-.21666E+00	.77520E+03	.63695E+04	.74144E+03
Link 33	.11148E+02	.12904E+01	-.54035E-02	-.19251E+02	.23787E+02	.12212E+01	.41366E+02	-.83214E+04	.81710E+03
Link 34	.17194E+02	.12571E+01	-.58998E-02	-.25845E+02	.13623E+02	-.62332E+00	-.25856E+04	-.10332E+05	-.22778E+03
Link 35	.23239E+02	.11968E+01	-.13151E-01	-.33601E+02	-.23829E+01	.19404E+01	-.34804E+04	-.90656E+04	-.15168E+03
Link 36	.29283E+02	.12856E+01	.41967E-01	-.37104E+02	-.32133E+00	-.35838E+01	.62089E+04	-.84796E+04	-.16855E+03
Link 37	.35329E+02	.13284E+01	-.27478E-01	-.26249E+02	.18984E+02	.17602E+01	.31950E+05	.24033E+05	.16732E+04
Link 38	.41388E+02	.13561E+01	.33896E-01	-.28593E+01	.16823E+02	-.91957E+01	.49676E+05	.29090E+04	.41024E+04
Link 39	.47456E+02	.12260E+01	-.80581E-01	.33950E+02	.21836E+02	.21368E+02	.63022E+05	-.23572E+05	.92374E+04
Link 40	.53497E+02	.16039E+01	.19809E+00	.58037E+02	.45838E+02	.22898E+01	.13681E+05	-.11283E+06	-.58169E+04
Link 41	.59420E+02	.30651E+01	.29893E+00	.56027E+02	-.95867E+02	-.16858E+02	-.46328E+05	-.12338E+06	-.25317E+05
Link 42	.65383E+02	.39932E+01	.34361E-01	.31148E+02	-.24608E+03	-.64866E+01	-.98963E+05	-.69851E+05	-.31134E+05

Displacements, Velocities, and Accelerations

		X	Y	Theta	X-Vel	Y-Vel	Omega	X-Accel	Y-Accel	Alpha
Link	43	.71432E+02	.62478E+01	.78665E-01	.16121E+02	-.34287E+03	-.43797E+02	-.48189E+06	-.21536E+07	-.22887E+05
Link	44	.77348E+02	.52112E+01	.26237E+00	-.77999E+02	-.34643E+03	.51924E+02	.43460E+06	-.93354E+06	-.24727E+05
Link	45	.81329E+02	.87329E+01	.12009E+01	-.21798E+03	-.23174E+03	.44051E+02	.90489E+04	.18769E+04	-.91771E+04
Link	46	.82263E+02	.14473E+02	.16218E+01	-.37189E+03	-.22460E+03	.20575E+02	.71884E+05	.56017E+04	-.41587E+04
Link	47	.80617E+02	.19875E+02	.21823E+01	-.45259E+03	-.23468E+03	.22817E+02	.64980E+05	-.27635E+05	-.18695E+04
Link	48	.75983E+02	.23435E+02	.27431E+01	-.44072E+03	-.18787E+03	-.21612E+01	.27265E+05	-.61337E+05	.17004E+05
Link	49	.70284E+02	.24627E+02	.31048E+01	-.35918E+03	-.63078E+02	-.32239E+02	.30525E+05	.50609E+05	.30086E+05
Link	50	.64390E+02	.25094E+02	.30008E+01	-.29806E+03	.65309E+01	-.78686E+01	.44845E+05	.75832E+05	.13681E+05
Link	51	.58513E+02	.25554E+02	.31166E+01	-.27719E+03	.47526E+02	-.27423E+02	.92016E+04	.84566E+05	.89896E+04
Link	52	.52646E+02	.26095E+02	.29842E+01	-.29310E+03	.10819E+03	.72645E+01	-.42546E+05	.22065E+05	-.67952E+04
Link	53	.46765E+02	.26426E+02	-.30940E+01	-.29754E+03	.99978E+02	-.35872E+01	-.51839E+05	.42369E+03	-.10661E+03
Link	54	.40843E+02	.25991E+02	-.30425E+01	-.28921E+03	.10877E+03	-.50842E+01	-.10735E+06	.21944E+05	-.14027E+04
Link	55	.34885E+02	.25918E+02	.30710E+01	-.28864E+03	.81182E+02	.84212E+01	-.15368E+06	-.22585E+05	-.42405E+04
Link	56	.28856E+02	.26090E+02	-.31269E+01	-.30187E+03	.86603E+02	-.13750E+02	-.13678E+06	-.16185E+05	.10484E+04
Link	57	.22812E+02	.26552E+02	.29716E+01	-.33297E+03	.67125E+02	.21323E+02	-.10281E+06	.26496E+05	.42057E+04
Link	58	.16731E+02	.26958E+02	-.31051E+01	-.34868E+03	.65887E+01	.26935E+01	-.19211E+05	-.29529E+05	-.27737E+04
Link	59	.10602E+02	.26741E+02	-.31064E+01	-.32487E+03	.19500E+02	-.22622E+01	.63918E+04	-.35059E+04	-.41910E+03
Link	60	.44729E+01	.26639E+02	.31390E+01	-.31081E+03	.24677E+02	-.89266E-01	-.57282E+04	.17994E+05	.17980E+03

Forces and Moments

		FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Vehicle		.35504E+05	.97955E+05	-.32280E+07						
Wheel	1	-.25360E+05	.10429E+05	.00000E+00						
Wheel	2	-.11957E+04	-.22804E+04	.00000E+00						
Wheel	3	.12656E+03	-.12639E+04	.00000E+00						
Wheel	4	.46624E+02	.35597E+03	.00000E+00						
Wheel	5	.15602E+04	.49710E+04	.00000E+00						
Wheel	6	-.78462E+01	.41495E+04	.00000E+00						
Wheel	7	.53156E+05	.13584E+06	.00000E+00						
Link	1	.00000E+00	-.20093E+02	.00000E+00	.18610E+05	-.45423E+03	-.19508E+05	.79977E+03	-.39103E+02	-.14732E+02
Link	2	.00000E+00	-.20093E+02	.00000E+00	.19508E+05	-.79977E+03	-.18688E+05	.72616E+03	.14732E+02	.21991E+02
Link	3	.00000E+00	-.20093E+02	.00000E+00	.18688E+05	-.72616E+03	-.17712E+05	.73607E+03	-.21991E+02	-.28072E+01
Link	4	.00000E+00	-.20093E+02	.00000E+00	.17712E+05	-.73607E+03	-.15597E+05	.76943E+03	.28072E+01	-.39314E+03
Link	5	.00000E+00	-.20093E+02	.00000E+00	.15597E+05	-.76943E+03	-.10983E+05	.34837E+03	.39314E+03	.16326E+03
Link	6	.00000E+00	-.20093E+02	.00000E+00	.10983E+05	-.34837E+03	-.28762E+04	.14281E+02	-.16326E+03	.29276E+03
Link	7	.00000E+00	-.20093E+02	.00000E+00	.28762E+04	-.14281E+02	.37602E+04	.11282E+03	-.29276E+03	-.35446E+03
Link	8	.00000E+00	-.20093E+02	.00000E+00	-.37602E+04	-.11282E+03	.73858E+04	-.42469E+03	.35446E+03	.25427E+03
Link	9	.00000E+00	-.20093E+02	.00000E+00	-.73858E+04	.42469E+03	.92874E+04	-.10789E+04	-.25427E+03	-.23111E+03
Link	10	.00000E+00	-.20093E+02	.00000E+00	-.92874E+04	.10789E+04	.14177E+05	-.12636E+04	.23111E+03	.35356E+03
Link	11	.00000E+00	-.20093E+02	.00000E+00	-.14177E+05	.12636E+04	.21278E+05	.70329E+03	-.35356E+03	-.11472E+03
Link	12	.00000E+00	-.20093E+02	.00000E+00	-.21278E+05	-.70329E+03	.22222E+05	.93816E+03	.11472E+03	.51772E+03
Link	13	.00000E+00	-.20093E+02	.00000E+00	-.22222E+05	-.93816E+03	.13984E+05	.32295E+04	-.51772E+03	.12084E+04
Link	14	.00000E+00	-.20093E+02	.00000E+00	-.13984E+05	-.32295E+04	.56324E+04	.36667E+04	-.12084E+04	.26839E+04
Link	15	.00000E+00	-.20093E+02	.00000E+00	-.56324E+04	-.36667E+04	-.26247E+04	.52292E+04	-.26839E+04	.22302E+04
Link	16	.00000E+00	-.20093E+02	.00000E+00	.26247E+04	-.52292E+04	-.19348E+05	.44632E+04	-.22302E+04	-.45609E+03
Link	17	-.50016E+05	-.29943E+05	.00000E+00	.19348E+05	-.44632E+04	.28981E+05	.42394E+03	.45609E+03	-.83170E+04
Link	18	-.18570E+05	-.51237E+05	.00000E+00	-.28981E+05	-.42394E+03	.63178E+04	.74522E+03	.83170E+04	.12500E+05
Link	19	.00000E+00	-.20093E+02	.00000E+00	-.63178E+04	-.74522E+03	.42362E+04	.24991E+04	-.12500E+05	-.17523E+04
Link	20	.00000E+00	-.20093E+02	.00000E+00	-.42362E+04	-.24991E+04	.13938E+04	.31362E+04	.17523E+04	-.19478E+04
Link	21	.00000E+00	-.20093E+02	.00000E+00	-.13938E+04	-.31362E+04	-.27554E+03	.20685E+04	.19478E+04	.12646E+04
Link	22	.00000E+00	-.20093E+02	.00000E+00	.27554E+03	-.20685E+04	-.19238E+04	-.14823E+03	-.12646E+04	.26422E+03
Link	23	.00000E+00	-.20093E+02	.00000E+00	.19238E+04	.14823E+03	-.35568E+04	-.32562E+03	-.26422E+03	-.14274E+04

Forces and Moments

		FX	FY	M	FX-End 1	FY-End 1	FX-End 2	FY-End 2	M-End 1	M-End 2
Link	24	.00000E+00	-.20093E+02	.00000E+00	.35568E+04	.32562E+03	-.34546E+04	-.29698E+02	.14274E+04	.18126E+03
Link	25	.00000E+00	-.20093E+02	.00000E+00	.34546E+04	.29698E+02	-.13878E+04	.40790E+03	-.18126E+03	-.48640E+03
Link	26	.00000E+00	-.20093E+02	.00000E+00	.13878E+04	-.40790E+03	.12963E+04	.53859E+03	.48640E+03	.78568E+03
Link	27	.00000E+00	.10593E+04	.00000E+00	-.12963E+04	-.53859E+03	.33174E+04	-.30095E+03	-.78568E+03	.12070E+03
Link	28	.00000E+00	.80811E+03	.00000E+00	-.33174E+04	.30095E+03	.45699E+04	-.37006E+03	-.12070E+03	-.24888E+03
Link	29	.00000E+00	-.20093E+02	.00000E+00	-.45699E+04	.37006E+03	.54625E+04	-.18255E+03	.24888E+03	-.51813E+02
Link	30	.00000E+00	-.20093E+02	.00000E+00	-.54625E+04	.18255E+03	.60898E+04	.12673E+03	.51813E+02	.25966E+02
Link	31	-.12056E+02	-.13753E+03	.00000E+00	-.60898E+04	-.12673E+03	.63913E+04	.14467E+03	-.25966E+02	-.47541E+02
Link	32	.00000E+00	-.20093E+02	.00000E+00	-.63913E+04	-.14467E+03	.64316E+04	.49598E+03	.47541E+02	.77706E+02
Link	33	.00000E+00	-.20093E+02	.00000E+00	-.64316E+04	-.49598E+03	.64338E+04	.83359E+02	-.77706E+02	-.15292E+03
Link	34	.00000E+00	-.20093E+02	.00000E+00	-.64338E+04	-.83359E+02	.62993E+04	-.43382E+03	.15292E+03	.19476E+03
Link	35	-.49423E+03	-.12384E+04	.00000E+00	-.62993E+04	.43382E+03	.66125E+04	.33316E+03	-.19476E+03	-.33120E+03
Link	36	.00000E+00	-.20093E+02	.00000E+00	-.66125E+04	-.33316E+03	.69354E+04	-.87684E+02	.33120E+03	.28428E+03
Link	37	.00000E+00	-.20093E+02	.00000E+00	-.69354E+04	.87684E+02	.85968E+04	.11821E+04	-.28428E+03	-.76423E+03
Link	38	.00000E+00	-.20093E+02	.00000E+00	-.85968E+04	-.11821E+04	.11180E+05	.13535E+04	.76423E+03	.22590E+04
Link	39	-.87446E+03	-.39369E+04	.00000E+00	-.11180E+05	-.13535E+04	.15332E+05	.40646E+04	-.22590E+04	-.94595E+03
Link	40	.00000E+00	-.20093E+02	.00000E+00	-.15332E+05	-.40646E+04	.16043E+05	-.17826E+04	.94595E+03	-.13500E+04
Link	41	.00000E+00	-.20093E+02	.00000E+00	-.16043E+05	.17826E+04	.13634E+05	-.81781E+04	.13500E+04	.26095E+03
Link	42	.00000E+00	-.20093E+02	.00000E+00	-.13634E+05	.81781E+04	.84878E+04	-.11790E+05	-.26095E+03	-.29715E+04
Link	43	-.20397E+05	-.11670E+06	.00000E+00	-.84878E+04	.11790E+05	.38269E+04	-.70753E+04	.29715E+04	.82896E+04
Link	44	.26534E+05	-.48131E+05	.00000E+00	-.38269E+04	.70753E+04	-.10814E+03	-.74890E+04	-.82896E+04	.14543E+04
Link	45	.00000E+00	-.20093E+02	.00000E+00	.10814E+03	.74890E+04	.36240E+03	-.73713E+04	-.14543E+04	-.98925E+03
Link	46	.00000E+00	-.20093E+02	.00000E+00	-.36240E+03	.73713E+04	.41004E+04	-.70599E+04	.98925E+03	.14399E+04
Link	47	.00000E+00	-.20093E+02	.00000E+00	-.41004E+04	.70599E+04	.74793E+04	-.84768E+04	-.14399E+04	-.79956E+03
Link	48	.00000E+00	-.20093E+02	.00000E+00	-.74793E+04	.84768E+04	.88971E+04	-.11646E+05	.79956E+03	-.16651E+04
Link	49	.00000E+00	-.20093E+02	.00000E+00	-.88971E+04	.11646E+05	.10484E+05	-.89945E+04	.16651E+04	.17727E+04
Link	50	.00000E+00	-.20093E+02	.00000E+00	-.10484E+05	.89945E+04	.12816E+05	-.50311E+04	-.17727E+04	-.13500E+04
Link	51	.00000E+00	-.20093E+02	.00000E+00	-.12816E+05	.50311E+04	.13295E+05	-.61360E+03	.13500E+04	.25583E+04
Link	52	.00000E+00	-.20093E+02	.00000E+00	-.13295E+05	.61360E+03	.11082E+05	.55076E+03	-.25583E+04	-.43400E+03
Link	53	.00000E+00	-.20093E+02	.00000E+00	-.11082E+05	-.55076E+03	.83867E+04	.59289E+03	.43400E+03	-.77757E+01
Link	54	.00000E+00	-.20093E+02	.00000E+00	-.83867E+04	-.59289E+03	.28046E+04	.17541E+04	.77757E+01	.73147E+03
Link	55	.00000E+00	-.20093E+02	.00000E+00	-.28046E+04	-.17541E+04	-.51870E+04	.59973E+03	-.73147E+03	-.16337E+04
Link	56	.00000E+00	-.20093E+02	.00000E+00	.51870E+04	-.59973E+03	-.12299E+05	-.22178E+03	.16337E+04	.24729E+04
Link	57	.00000E+00	-.20093E+02	.00000E+00	.12299E+05	.22178E+03	-.17646E+05	.11761E+04	-.24729E+04	-.10706E+04
Link	58	.00000E+00	-.20093E+02	.00000E+00	.17646E+05	-.11761E+04	-.18645E+05	-.33932E+03	.10706E+04	-.41076E+03
Link	59	.00000E+00	-.20093E+02	.00000E+00	.18645E+05	.33932E+03	-.18312E+05	-.50154E+03	.41076E+03	.94035E+02
Link	60	.00000E+00	-.20093E+02	.00000E+00	.18312E+05	.50154E+03	-.18610E+05	.45423E+03	-.94035E+02	.39103E+02

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2
1	.60000E+01	.18616E+05	.19524E+05	-.13293E+00	.32445E-02	.13934E+00	-.57126E-02	.13297E+00	.13946E+00
2	.60000E+01	.19524E+05	.18702E+05	-.13934E+00	.57126E-02	.13348E+00	-.51869E-02	.13946E+00	.13359E+00
3	.60000E+01	.18702E+05	.17727E+05	-.13348E+00	.51869E-02	.12651E+00	-.52576E-02	.13359E+00	.12662E+00
4	.60000E+01	.17727E+05	.15616E+05	-.12651E+00	.52576E-02	.11141E+00	-.54959E-02	.12662E+00	.11154E+00
5	.60000E+01	.15616E+05	.10989E+05	-.11141E+00	.54959E-02	.78451E-01	-.24884E-02	.11154E+00	.78491E-01
6	.60000E+01	.10989E+05	.28762E+04	-.78451E-01	.24884E-02	.20544E-01	-.10200E-03	.78491E-01	.20544E-01
7	.60000E+01	.28762E+04	.37619E+04	-.20544E-01	.10200E-03	-.26859E-01	-.80585E-03	.20544E-01	.26871E-01
8	.60000E+01	.37619E+04	.73980E+04	.26859E-01	.80585E-03	-.52756E-01	.30335E-02	.26871E-01	.52843E-01
9	.60000E+01	.73980E+04	.93498E+04	.52756E-01	-.30335E-02	-.66338E-01	.77062E-02	.52843E-01	.66785E-01
10	.60000E+01	.93498E+04	.14234E+05	.66338E-01	-.77062E-02	-.10127E+00	.90254E-02	.66785E-01	.10167E+00
11	.60000E+01	.14234E+05	.21289E+05	.10127E+00	-.90254E-02	-.15198E+00	.50235E-02	.10167E+00	.15207E+00
12	.60000E+01	.21289E+05	.22242E+05	.15198E+00	.50235E-02	-.15873E+00	-.67011E-02	.15207E+00	.15887E+00

Link Offsets and Tension Data

L	Length	Tension-1	Tension-2	Del X1	Del Y1	Del X2	Del Y2	Del 1	Del 2	
13	.60000E+01	.22242E+05	.14352E+05	.15873E+00	.67011E-02	-.99886E-01	-.23068E-01	.15887E+00	.10252E+00	
14	.60000E+01	.14352E+05	.67208E+04	.99886E-01	.23068E-01	-.40231E-01	-.26191E-01	.10252E+00	.48005E-01	
15	.60000E+01	.67208E+04	.58509E+04	.40231E-01	.26191E-01	.18748E-01	-.37351E-01	.48005E-01	.41792E-01	
16	.60000E+01	.58509E+04	.19857E+05	-.18748E-01	.37351E-01	.13820E+00	-.31880E-01	.41792E-01	..4183E+00	
17	.60000E+01	.19857E+05	.28984E+05	-.13820E+00	.31880E-01	-.20701E+00	-.30282E-02	.14183E+00	.20703E+00	Wheel 1
18	.60000E+01	.28984E+05	.63616E+04	.20701E+00	.30282E-02	-.45127E-01	-.53230E-02	.20703E+00	.45440E-01	Wheel 1
19	.60000E+01	.63616E+04	.49185E+04	.45127E-01	.53230E-02	-.30259E-01	-.17851E-01	.45440E-01	.35132E-01	
20	.60000E+01	.49185E+04	.34320E+04	.30259E-01	.17851E-01	-.99556E-02	-.22402E-01	.35132E-01	.24514E-01	
21	.60000E+01	.34320E+04	.20867E+04	.99556E-02	.22402E-01	.19682E-02	-.14775E-01	.24514E-01	.14905E-01	
22	.60000E+01	.20867E+04	.19295E+04	-.19682E-02	.14775E-01	.13742E-01	.10588E-02	.14905E-01	.13782E-01	
23	.60000E+01	.19295E+04	.35717E+04	-.13742E-01	-.10588E-02	.25406E-01	.23258E-02	.13782E-01	.25512E-01	
24	.60000E+01	.35717E+04	.34547E+04	-.25406E-01	-.23258E-02	.24676E-01	.21213E-03	.25512E-01	.24676E-01	
25	.60000E+01	.34547E+04	.14465E+04	-.24676E-01	-.21213E-03	.99125E-02	-.29136E-02	.24676E-01	.10332E-01	
26	.60000E+01	.14465E+04	.14037E+04	-.99125E-02	.29136E-02	-.92592E-02	-.38471E-02	.10332E-01	.10027E-01	
27	.60000E+01	.14037E+04	.33310E+04	.92592E-02	.38471E-02	-.23696E-01	.21496E-01	.10027E-01	.23793E-01	Ground
28	.60000E+01	.33310E+04	.45848E+04	.23696E-01	-.21496E-02	-.32642E-01	.26433E-02	.23793E-01	.32749E-01	Ground
29	.60000E+01	.45848E+04	.54655E+04	.32642E-01	-.26433E-02	-.39018E-01	.13039E-02	.32749E-01	.39039E-01	
30	.60000E+01	.54655E+04	.60912E+04	.39018E-01	-.13039E-02	-.43499E-01	-.90522E-03	.39039E-01	.43508E-01	
31	.60000E+01	.60912E+04	.63929E+04	.43499E-01	.90522E-03	-.45652E-01	-.10333E-02	.43508E-01	.45664E-01	Ground and Wheel 4
32	.60000E+01	.63929E+04	.66507E+04	.45652E-01	.10333E-02	-.45940E-01	-.35427E-02	.45664E-01	.46076E-01	
33	.60000E+01	.66507E+04	.66343E+04	.45940E-01	.35427E-02	-.45955E-01	-.59542E-03	.46076E-01	.45959E-01	
34	.60000E+01	.66343E+04	.63142E+04	.45955E-01	.59542E-03	-.44995E-01	.30987E-02	.45959E-01	.45102E-01	
35	.60000E+01	.63142E+04	.66209E+04	.44995E-01	-.30987E-02	-.47232E-01	-.23797E-02	.45102E-01	.47292E-01	Ground and Wheel 5
36	.60000E+01	.66209E+04	.69360E+04	.47232E-01	.23797E-02	-.49539E-01	.62632E-03	.47292E-01	.49543E-01	
37	.60000E+01	.69360E+04	.86777E+04	.49539E-01	-.62632E-03	-.61406E-01	-.84437E-02	.49543E-01	.61984E-01	
38	.60000E+01	.86777E+04	.11262E+05	.61406E-01	.84437E-02	-.79857E-01	-.96677E-02	.61984E-01	.80440E-01	
39	.60000E+01	.11262E+05	.15861E+05	.79857E-01	.96677E-02	-.10951E+00	-.29033E-01	.80440E-01	.11329E+00	Ground and Wheel 6
40	.60000E+01	.15861E+05	.16142E+05	.10951E+00	.29033E-01	-.11459E+00	.12733E-01	.11329E+00	.11530E+00	
41	.60000E+01	.16142E+05	.15899E+05	.11459E+00	-.12733E-01	-.97385E-01	.58415E-01	.11530E+00	.11356E+00	
42	.60000E+01	.15899E+05	.14528E+05	.97385E-01	-.58415E-01	-.60627E-01	.84216E-01	.11356E+00	.10377E+00	
43	.60000E+01	.14528E+05	.80439E+04	.60627E-01	-.84216E-01	-.27335E-01	.50538E-01	.10377E+00	.57457E-01	Wheel 7
44	.60000E+01	.80439E+04	.74897E+04	.27335E-01	-.50538E-01	.77243E-03	.53493E-01	.57457E-01	.53498E-01	Wheel 7
45	.60000E+01	.74897E+04	.73802E+04	-.77243E-03	-.53493E-01	-.25886E-02	.52652E-01	.53498E-01	.52715E-01	
46	.60000E+01	.73802E+04	.81642E+04	.25886E-02	-.52652E-01	-.29288E-01	.50428E-01	.52715E-01	.58316E-01	
47	.60000E+01	.81642E+04	.11305E+05	.29288E-01	-.50428E-01	-.53424E-01	.60549E-01	.58316E-01	.80748E-01	
48	.60000E+01	.11305E+05	.14656E+05	.53424E-01	-.60549E-01	-.63551E-01	.83187E-01	.80748E-01	.10468E+00	
49	.60000E+01	.14656E+05	.13814E+05	.63551E-01	-.83187E-01	-.74888E-01	.64246E-01	.10468E+00	.98670E-01	
50	.60000E+01	.13814E+05	.13768E+05	.74888E-01	-.64246E-01	-.91542E-01	.35937E-01	.98670E-01	.98346E-01	
51	.60000E+01	.13768E+05	.13309E+05	.91545E-01	-.35937E-01	-.94963E-01	.43829E-02	.98346E-01	.95064E-01	
52	.60000E+01	.13309E+05	.11096E+05	.94963E-01	-.43829E-02	-.79160E-01	-.39340E-02	.95064E-01	.79257E-01	
53	.60000E+01	.11096E+05	.84077E+04	.79160E-01	.39340E-02	-.59905E-01	-.42349E-02	.79257E-01	.60055E-01	
54	.60000E+01	.84077E+04	.33080E+04	.59905E-01	.42349E-02	-.20033E-01	-.12529E-01	.60055E-01	.23628E-01	
55	.60000E+01	.33080E+04	.52215E+04	.20033E-01	.12529E-01	.37050E-01	-.42838E-02	.23628E-01	.37297E-01	
56	.60000E+01	.52215E+04	.12301E+05	-.37050E-01	.42838E-02	.87852E-01	.15842E-02	.37297E-01	.87867E-01	
57	.60000E+01	.12301E+05	.17685E+05	-.87852E-01	-.15842E-02	.12604E+00	-.84008E-02	.87867E-01	.12632E+00	
58	.60000E+01	.17685E+05	.18648E+05	-.12604E+00	.84008E-02	.13318E+00	.24237E-02	.12632E+00	.13320E+00	
59	.60000E+01	.18648E+05	.18319E+05	-.13318E+00	-.24237E-02	.13080E+00	.35824E-02	.13320E+00	.13085E+00	
60	.60000E+01	.18319E+05	.18616E+05	-.13080E+00	-.35824E-02	.13293E+00	-.32445E-02	.13085E+00	.13297E+00	

Cyc	Time	Time-Step	DW-RPM
61	.0061	.0001000	2.500
62	.0062	.0001000	2.500

63	.0063	.0001000	2.500
64	.0064	.0001000	2.500
65	.0065	.0001000	2.500
66	.0066	.0001000	2.500
67	.0067	.0001000	2.500
68	.0068	.0001000	2.500
69	.0069	.0001000	2.500
70	.0070	.0001000	2.500

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Warren, Michigan 48397-5000

Director 1
U.S. Army Materiel Systems Analysis Activity (AMSAA)
ATTN: AMXSY-MP (Mr. Cohen)
Aberdeen Proving Ground, MD 21005-5071