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16. Abstract

This document is a Programmers' Manual for the computer-based mathematical simulation program entitled "Truck and Tractor-Trailer Dynamic Response Simulation - T3DRS:V1" developed in 1979 by the Highway Safety Research Institute/University of Michigan. This manual provides an introduction to the simulation program, with a description of its internal characteristics sufficient for a user to understand the program operational flow and to load, execute and debug simulation runs. A separate Users' Manual (FHWA-RD-79-125) describes the external characteristics in terms of the input/output data structure used.

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1.0 GENERAL INFORMATION

1.1 Purpose of the Manual

This document is a Programmer's Manual for the digital computer-based mathematical simulation program entitled "HSRI Truck and Tractor-Trailer Dynamic Response Simulation - T3DRS:V1" developed in 1979 by the Highway Safety Research Institute/University of Michigan. This manual provides an introduction to the simulation program with description of its internal characteristics sufficient for a user to understand the program operational flow and to load, execute and debug simulation runs. A separate User's Manual describes the input/output data structure of the program in further detail.

1.2 Background

Since 1971, HSRI has been conducting research under the sponsorship of the Motor Vehicle Manufacturers Association (MVMA) to develop computer-based methods for analyzing and predicting the directional and braking response of commercial motor vehicles. The initial phase of this research dealt with modeling the braking performance of commercial vehicles and was reported in Reference [1]* (Phase I). The second phase extended vehicle modeling to allow for directional response and was reported in Reference [2] (Phase II). The continuation of research into braking performance led to additional refinements in the braking simulation which were reported in Reference [3] (Phase III). In total, this research under the auspices of MVMA led to four separate computer simulation models:

-Straight Truck Braking Model (Phase I & III)

-Tractor-Trailer Braking Model (Phase I & III)

-Straight Truck Directional Response Model (Phase II)

-Tractor-Trailer Directional Response Model (Phase II)

Though all programs evolved from the same approach to vehicle modeling, separate programs were prepared and maintained.

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*Cited References are listed in Appendix C of this Manual.

In 1977, the Federal Highway Administration (FHWA) contracted with the HSRI to obtain braking and directional response simulations of trucks and tractor-trailers of the form of the Phase I, II, and III models. Requirements to add one or two full trailers (doubles and triples) to the tractor-semitrailer model were cause for reformulating the computer simulation model for the purposes of:

- Consolidating all vehicle combinations into one program
- Improving the input/output format
- Simplifying the model to include only the most relevant aspects as determined from the intervening research.

That work led to the new simulation program using the same model. The program, described here, is designated as "The Truck and Tractor-Trailer Dynamic Response Simulation - T3DRS:V1." Any subsequent changes to this program will be designated by a change in Version number.

1.3 Engineering Units

Throughout the T3DRS:V1 program, the English system of units is used. With the exceptions listed below, all input data are given in units of pounds, inches, degrees and seconds. Masses and weights are in units of pounds, with a gravitational constant of 386 in/sec/sec assumed. The units for input data parameters are defined in the input data echo.

Exceptions:

1) Input for the initial velocity is given in units of ft/sec.
2) Input describing trajectory points for the path-follower steering mode are defined in terms of feet lateral versus feet longitudinal.
3) Longitudinal and lateral road slope is defined in percent grade (Rise/Run).
4) Certain tandem-axle parameters are described in units of percent.

Output data units are defined on the printed output pages. In general, the same units are used throughout, although the vehicle position, velocity and acceleration variables use the length dimension unit of "ft."

2.0 PROGRAM DESCRIPTION

2.1 Program Identification

The program has been assigned the identification title of "HSRI Truck and Tractor-Trailer Dynamic Response Simulation - T3DRS:V1." To distinguish this particular simulation program from other simulation programs developed at HSRI, the code T3DRS:V1 has been added to the title. This code is to be interpreted in the following manner:

T3 - refers to the capability of simulating up to 3 trailers.

DRS - indicates the program is a dynamic response simulation.

V1 - identifies this program as version 1.

Each FORTRAN statement in the program is identified by a unique statement identification number of the form "V1 XXXXX," where

V1 - indicates version 1

XXXXX - is a five-digit number beginning with 00010 and sequentially increasing in value by increments of 10 (00020, 00030,...).

Since each computer system is capable of assigning different file line numbers and internal source numbers to the program, for standardization and uniform clarity, all references to the source program should utilize the FORTRAN statement identification numbers.

2.2 Program Structures

The program is written in FORTRAN IV, level G, as described in the IBM publication IBM System/360 and System/370 FORTRAN IV Language [4]. Five support subroutines are used from the IBM Scientific Subroutine Package (SSP). These subroutines (HPCG, SMPY, GMADD, GMPRD, and LOC) are described in detail and the source code is listed in the IBM publication System/360 Scientific Subroutine Package (360 A - CM - 036) Version II Programmer's Manual [5].

The T3DRS:V1 program consists of a very short main program and sixteen subroutines. By using this modular structure, future development and/or improvement of one aspect of the program (for example, suspension models, tires, or brakes) can be easily undertaken with minimal recompilation. The modular structure also facilitates partitioning of the program should overlay techniques be necessary to accommodate smaller in-house computers. As the user becomes more familiar with the program, a substantial reduction of computer core requirements may be achieved by the selective use and loading of subroutines necessary for each simulation. For example, simulations that do not use braking do not require the antilock subroutine. Thus, by loading a "dummy" antilock module, a savings of approximately 300K bytes can be achieved. Modules that may not be needed under certain simulation conditions are: TIRE1, TABIN, TABLXY, DRIVE1, TRAJ, ANTLKR, PRINT (see pages 32, 53, 46, 48, 51, 55, and 62, respectively). The following map of subroutine calls will assist in the understanding of the program structure and program flow. (See Figure 2.1.) Each routine is described in more detail in Sections 2.3.1-2.3.17.

Map of Subroutine Calls

I. MAIN calls Subroutine INPUT

- A. INPUT calls Subroutine TABIN
- B. INPUT calls Subroutine DRIVE1 if closed-loop steering is used
- C. INPUT calls Subroutine TANDEM
  - 1. TANDEM calls TABDIR (an entry point of TABIN) if nonlinear spring option is used
- D. INPUT calls Subroutine TIRINI
  - 1. TIRINI calls TABDIR (an entry point of TABIN) if either or both mu-x or mu-y tables are used
    - a) TABDIR calls either Subroutine TIRE1 or TIRDUP (entry point of TIRE1)

E. INPUT calls Subroutine BRAKE1

1. BRAKE1 calls TABDIR (entry point of TABIN) if pressure-torque tables are used

F. INPUT calls TABECH (entry point of TABIN)

G. INPUT calls Subroutine ANTLKR (if ANTILOCK option is used)

H. INPUT calls ANTLKW (entry point of ANTLKR) if ANTILOCK option is used

1. ANTLKW calls Subroutine PRINT

I. INPUT calls Subroutine TABLE if nonlinear springs are used

J. INPUT calls DRIVE2 (entry point of DRIVE1) if closed-loop steer option is used

II. MAIN calls Subroutine FCT1

III. MAIN calls Subroutine OUTPUT

A. OUTPUT calls Subroutine TABLE

IV. MAIN calls Subroutine HPCG

A. HPCG calls FCT (entry point of FCT1)

1. FCT calls TANDIN (entry point of TANDEM)

2. FCT calls Subroutine LINE

a) LINE calls Subroutine TABLE if nonlinear springs are used

3. FCT calls BRAKE2 (entry point of BRAKE1)

a) BRAKE2 calls Subroutine TABLE

b) BRAKE2 calls ANTILK (entry point of ANTLKR)

4. FCT calls TIRE (entry point of TIRINI)

a) TIRE calls ROAD if road option is chosen

b) TIRE calls Subroutine TABLXY

5. FCT calls TANDYN (entry point of TANDEM)

6. Return to HPCG

B. HPCG calls OUTP (entry point of OUTPUT)

1. OUTP calls Subroutine TABLE or DRIVER (entry point of DRIVE1) depending on steer mode

a) If DRIVER is called, DRIVER calls Subroutine SMPY

1) SMPY calls Subroutine LOC

b) DRIVER calls Subroutine GMDRD

c) DRIVER calls Subroutine GMADD

d) DRIVER calls Subroutine TRAJ

2. Return to HPCG

C. Return to MAIN if terminating conditions are met

V. MAIN calls OUTP1 (entry point of OUTPUT), if IHLF $\geq$ 11 or Velocity > 0

VI. MAIN calls RERUN (entry point of INPUT)

Global overview of T3DRS:V1 Program Flow

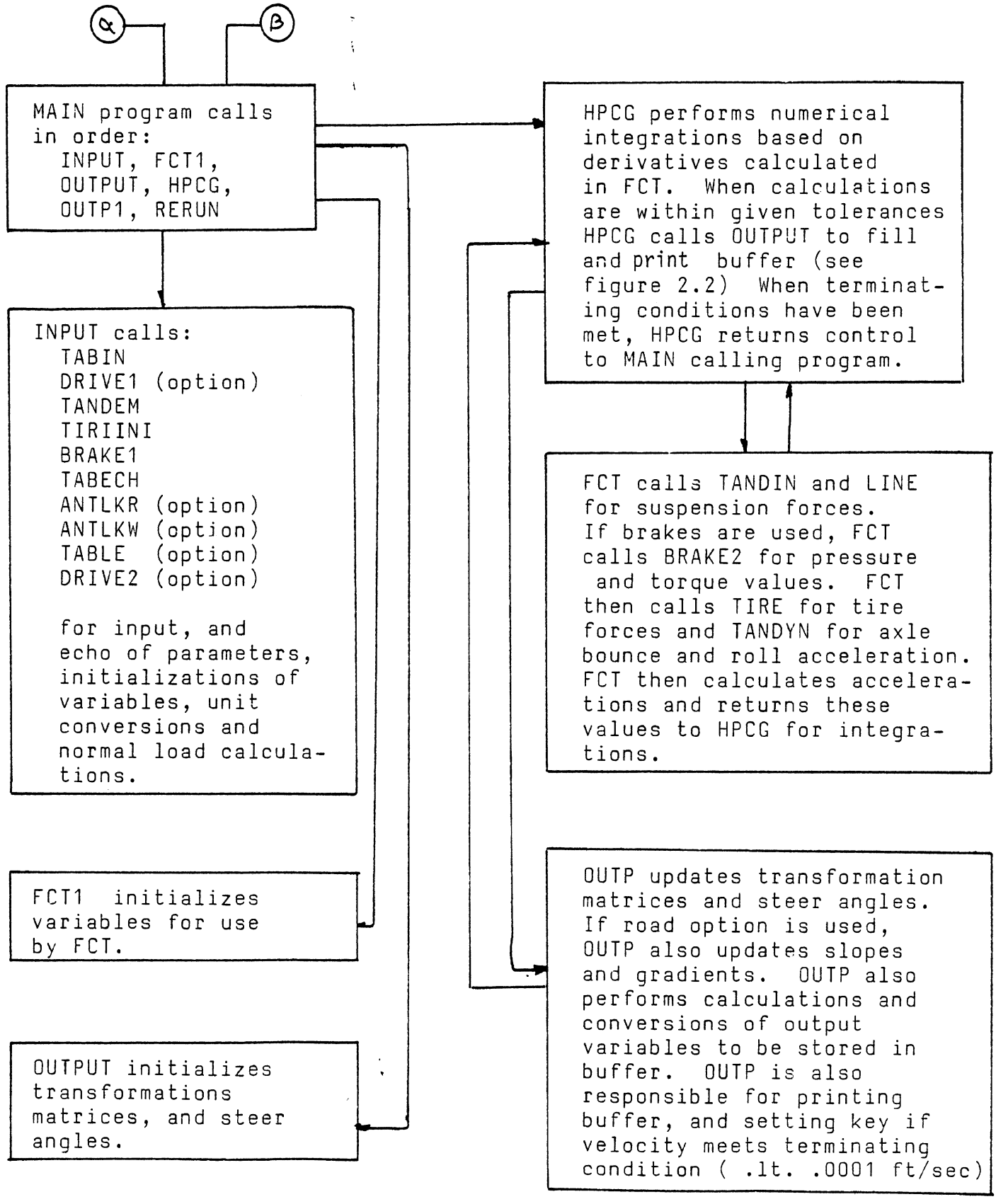
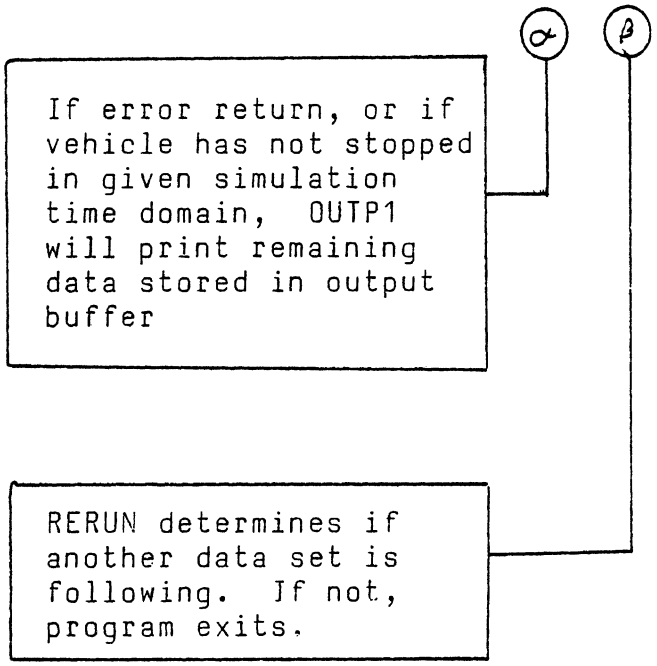


Figure 2.1

Global Overview of T3DRS:V1 Program Flow (con't)



Overview of HPCG

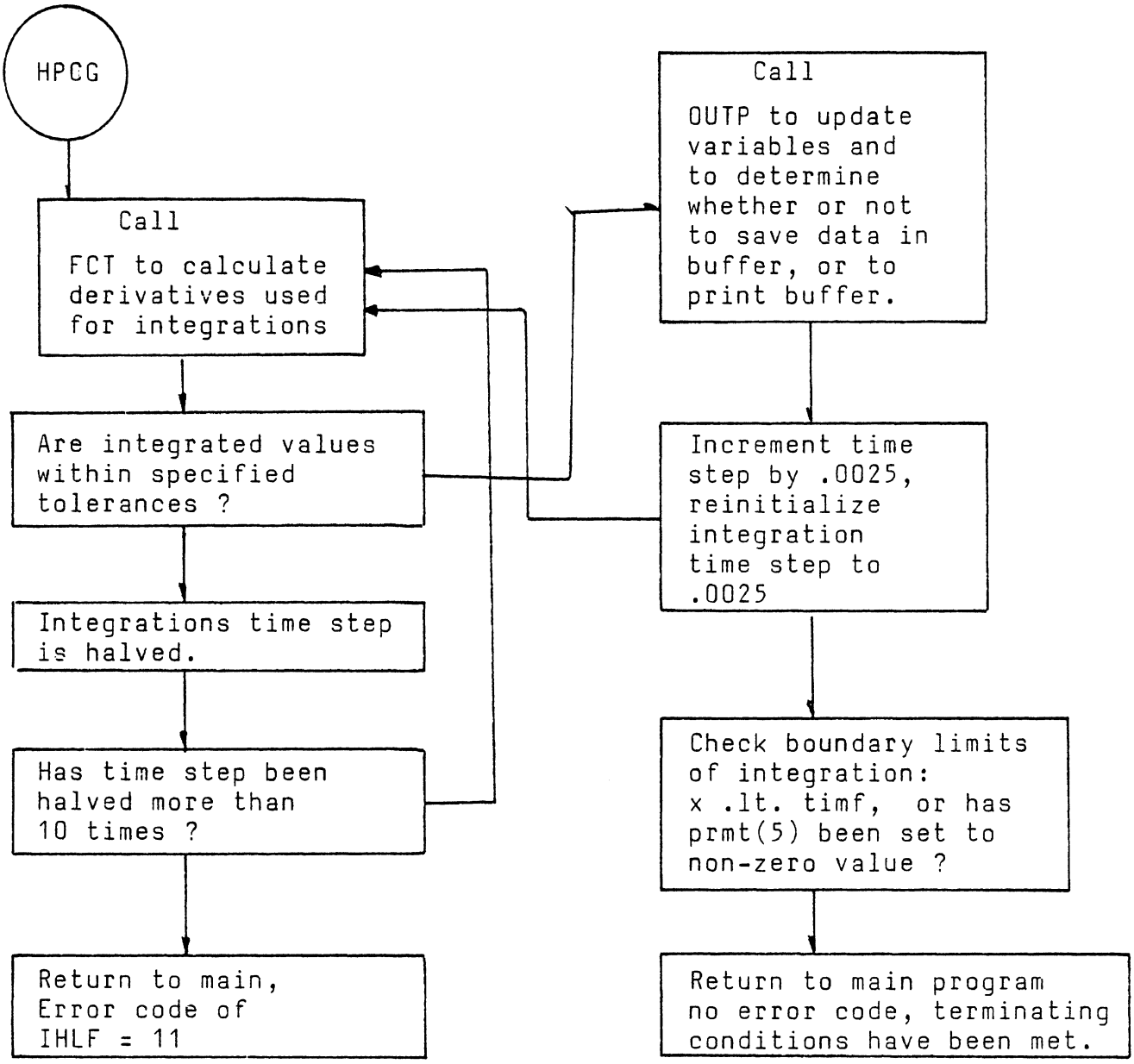


Figure 2.2

2.3 Program Subroutines

The following 17 sections are to assist the user in understanding the logic and operational flow of each of the subroutines written. Each section consists of eight subsections:

I. Purpose - a general overview of the subroutine's function.

II. Program flow - a narrative description, line-by-line, of the subroutine's operation. (Refer to Appendix B for the source list.)

III. Common blocks found in the subroutines (refer to Appendix A for the variable dictionary of arguments passed in common).

IV. Arguments passed - the subroutine's calling arguments and their description.

V. Library functions - a list of functions used by the subroutine, assumed to be on-line, or accessible through the system library.

VI. Subroutines referenced - a list of other subroutines called by the subroutine.

VII. Error message - any error message produced and the possible cause of the error.

VIII. Flowchart diagram.

Throughout the program, extensive use of comment cards has been made. By using the program flow narrative and the flowchart in conjunction with the source listing in Appendix B, the user should be able to familiarize himself with the program operational flow with relative ease and expedience.

2.3.1 Main Program.

I. Purpose:

a) To assign I/O device numbers

b) To initialize variables and functions used in HPCG

c) To act as program supervisor

Execute initializing calls to subroutines in proper order; turn control to HPCG; check return code from HPCG; check for continuation code.

II. Program Flow

a) Declarations (V1000010 - V1000090)

b) Set I/O devices (V1000100 - V1000120)

c) Initialize functions and tolerances for HPCG (V100130 - 00220)

d) Initializing call to Subroutine INPUT (V1000230 - V1000260)

e) Set HPCG initial conditions (V1000270 - V1000530)

f) Initializing call to Subroutine FCT1 (V1000540 - V1000580)

g) Initializing call to Subroutine OUTPUT (V1000580 - V1000610)

h) Turn control to HPCG (V1000620 - V1000650)

i) Check return code and continuation code (V1000660 - V1000810)

III. Common Blocks

page, CGLOC, ROADD

IV. Library Functions

None

V. Arguments

None

Main Program Flowchart

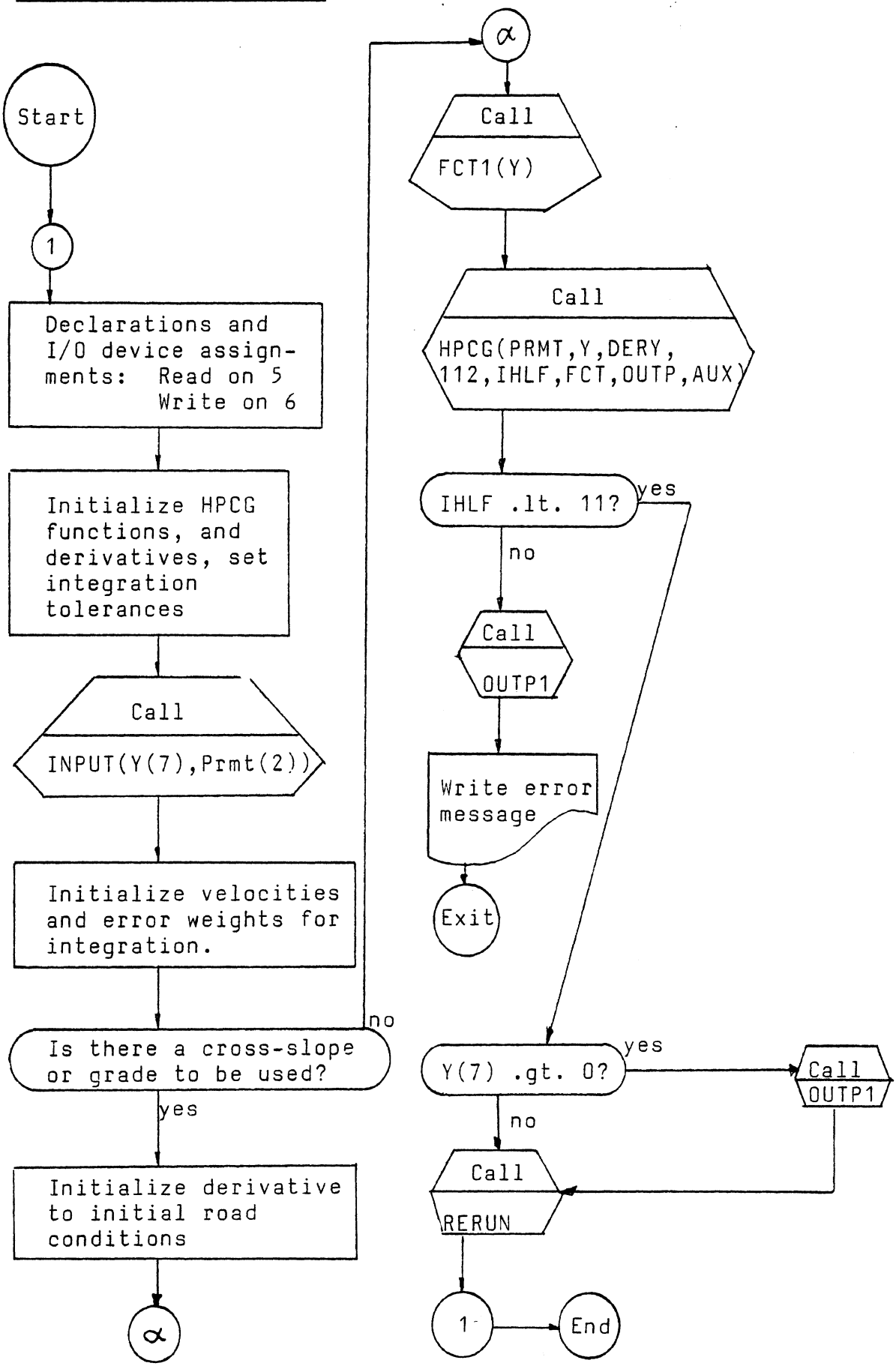


Figure 2.3

VI. Subroutines Referenced

INPUT, FCT1, OUTPUT, HPCG, OUTP1, EXIT, RERUN

VII. Error Messages

IHLF = 11 : indicates unsuccessful integration by HPCG

Probable causes: Limit maneuver causing rollover or wheel lift off

IHLF = 12 : indicates final time limit set to zero

IHLF = 13 : indicates initial time limit < 0

2.3.2 Subroutine INPUT.

I. Purpose:

a) Initialize variables to minimal/maximal values.

b) Read and echo sprung mass parameters and simulation controls.

c) Act as supervisor to call appropriate suspension, brake and tire routines for unsprung mass and brake parameter input.

d) Supervise table echo and antilock I/O.

e) Convert units from in., lb., deg., to ft., slugs, radians.

f) Compute sprung mass c.g. location and sprung weights (locate c.g. in relation to axles). Calculate change of c.g., inertia and mass due to payload.

g) Calculate normal static loads.

h) Initialize equilibrium point for nonlinear spring table.

i) Calculate total mass center and locate in relation to each axle.

j) Entry RERUN - determine if simulation program will continue with another data set.

Subroutine INPUT Flowchart

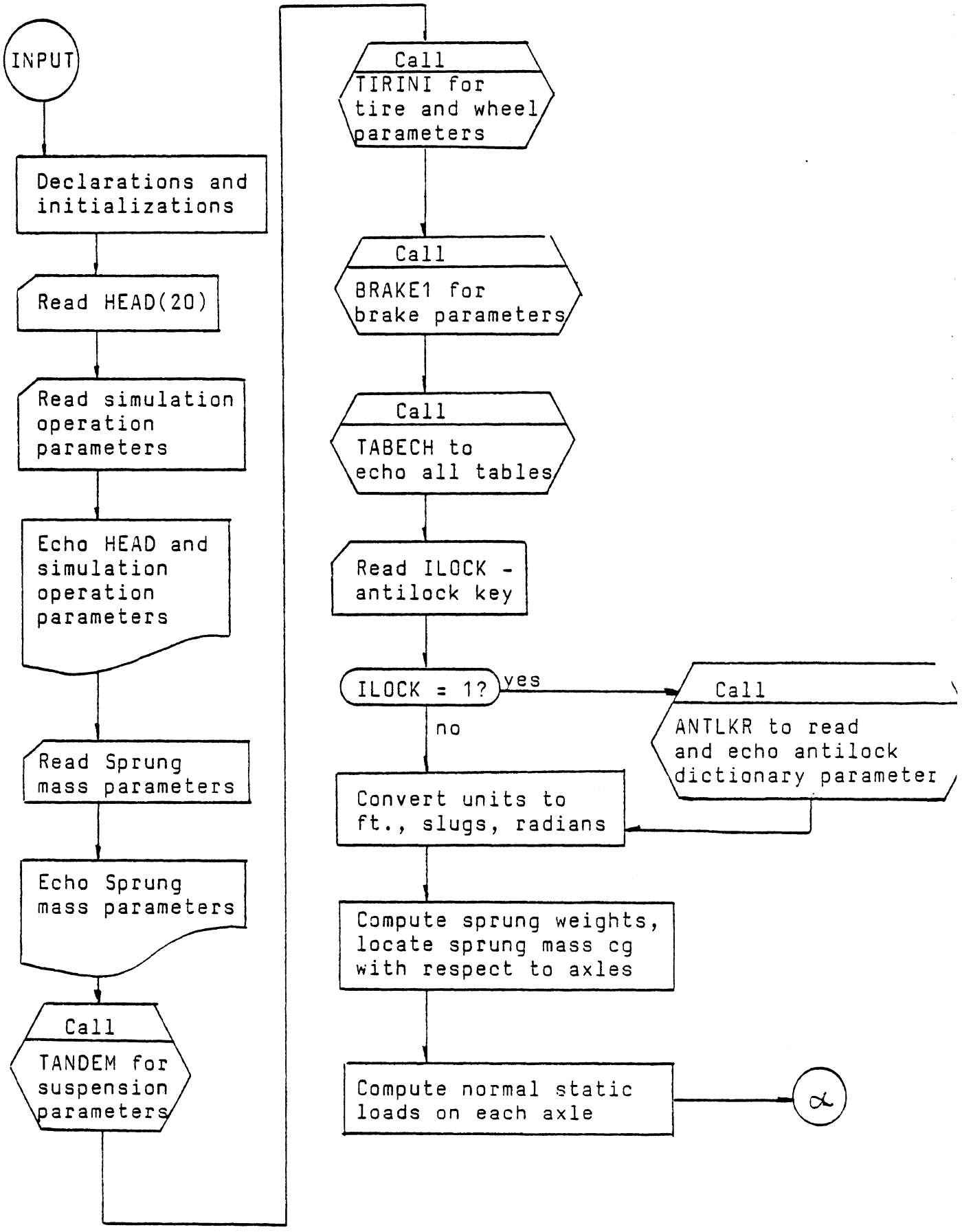


Figure 2.4

Subroutine INPUT Flowchart (con't)

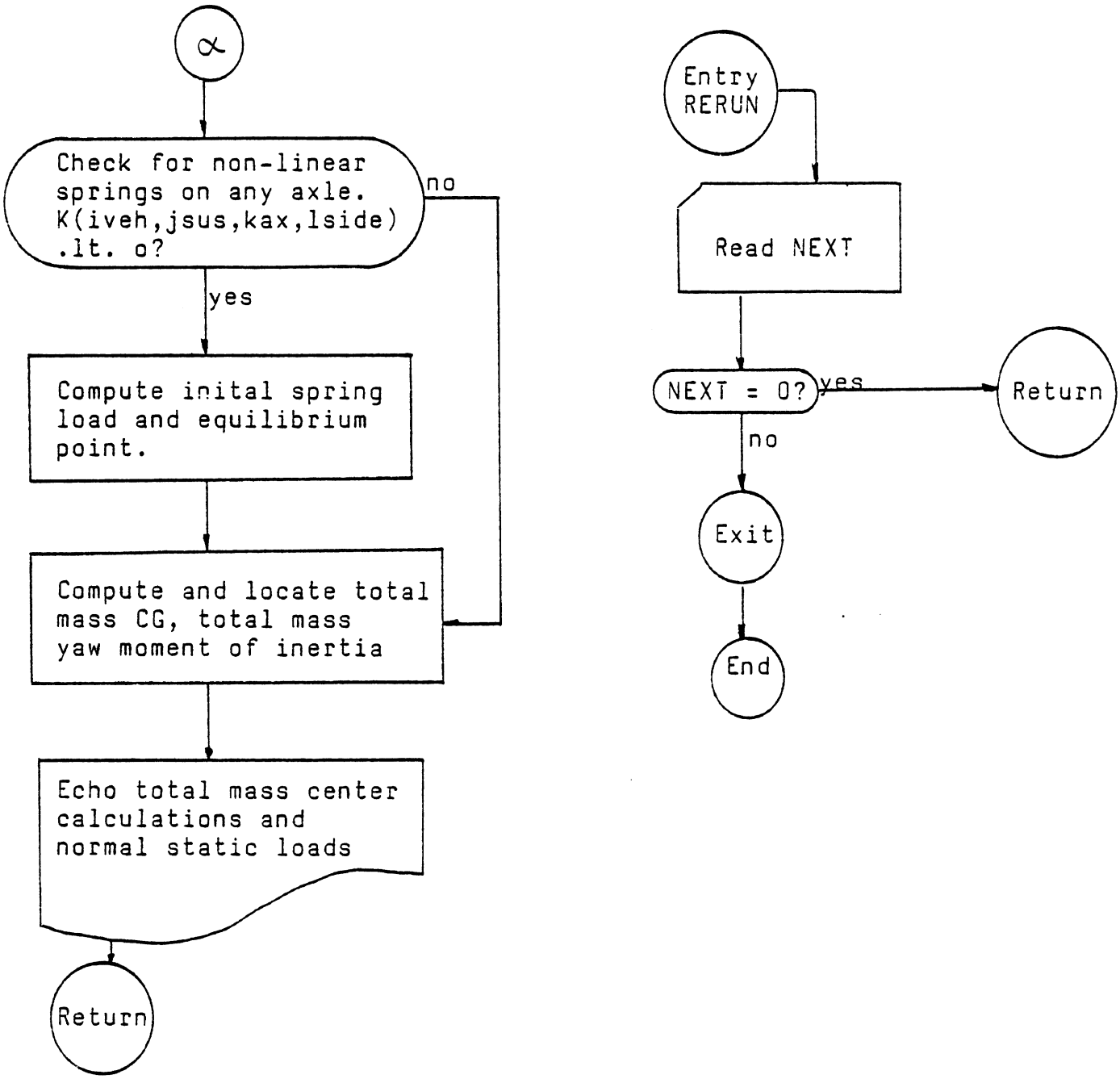


Figure 2.4 (Cont.)

II. Program Flow

a) Deceleration (V1000860 - V1001210)

b) Initialization (V1001220 - V1001510)

c) Read and echo simulation controls and sprung mass parameters (V1001520 - V1003590)

d) Call for axle, tire and brake input and echo (V1003600 - V1003790)

e) Check for antilock (V1003810 - V1003840)

f) Echo tables (V1003800 - V1003880)

g) If antilock is used, read and echo parameters (V1003890 - V1004050)

h) Unit conversion (V1004060 - V1004330)

i) Compute sprung weight + c.g., locate in relation to axles (both empty and loaded) (V1004340 - V1004860)

j) Compute normal static loads (V1004870 - V1005190)

k) For nonlinear springs, calculate initial loading and deflection (V1005200 - V1005390)

l) Calculate total mass c.g. location, total yaw moment of inertia and echo (V1005400 - V1006320)

m) Formats (V1006330 - V1007470)

n) Entry RERUN - Check for another data set (V1007480 - V1007520)

III. Common Blocks

PAGE, KEY, ROADD, TAND, SPMASS, BRAKE, ANTLK, CGLOC, DRIVE, STATIC, TIRES, UNSPM, SPRINGS, WHEEL, INOUT

IV. Library Functions

None

V. Arguments

INPUT (VEL,TIMF)
VEL is initial velocity of power-train wheels.
TIMF is maximum simulation time. These are used by MAIN to set boundary conditions of HPCG.

VI. Subroutines Referenced
ANTLK, BRAKE1, DRIVE1, TABIN, TABLE, TANDEM, TIRINI

VII. Error Messages
System interrupt only

2.3.3 Subroutine OUTPUT.

I. Purpose:

a) Initialize and update transformation matrices A and BZ which rotate axes from sprung mass to inertial plane and from unsprung to sprung mass planes, respectively.

b) Initialize and update steer angle of front tractor tires.

c) Calculate variables to be printed out.

d) Set up and print out output buffer according to user specifications.

e) Check if vehicle has stopped. If yes, set key to exit from HPCG.

II. Program Flow

a) Declaration (V1007660 - V1008210)

b) Initialization (V1008220 - V1008370)

c) Set up buffer keys (V1008380 - V1008870)

d) Initialize transformation matrices (V1008970 - V1009230)

e) Initialize steer angles (V1009240 - V1009330)

ENTRY FROM HPCG (V1009400)

Subroutine OUTPUT Flowchart

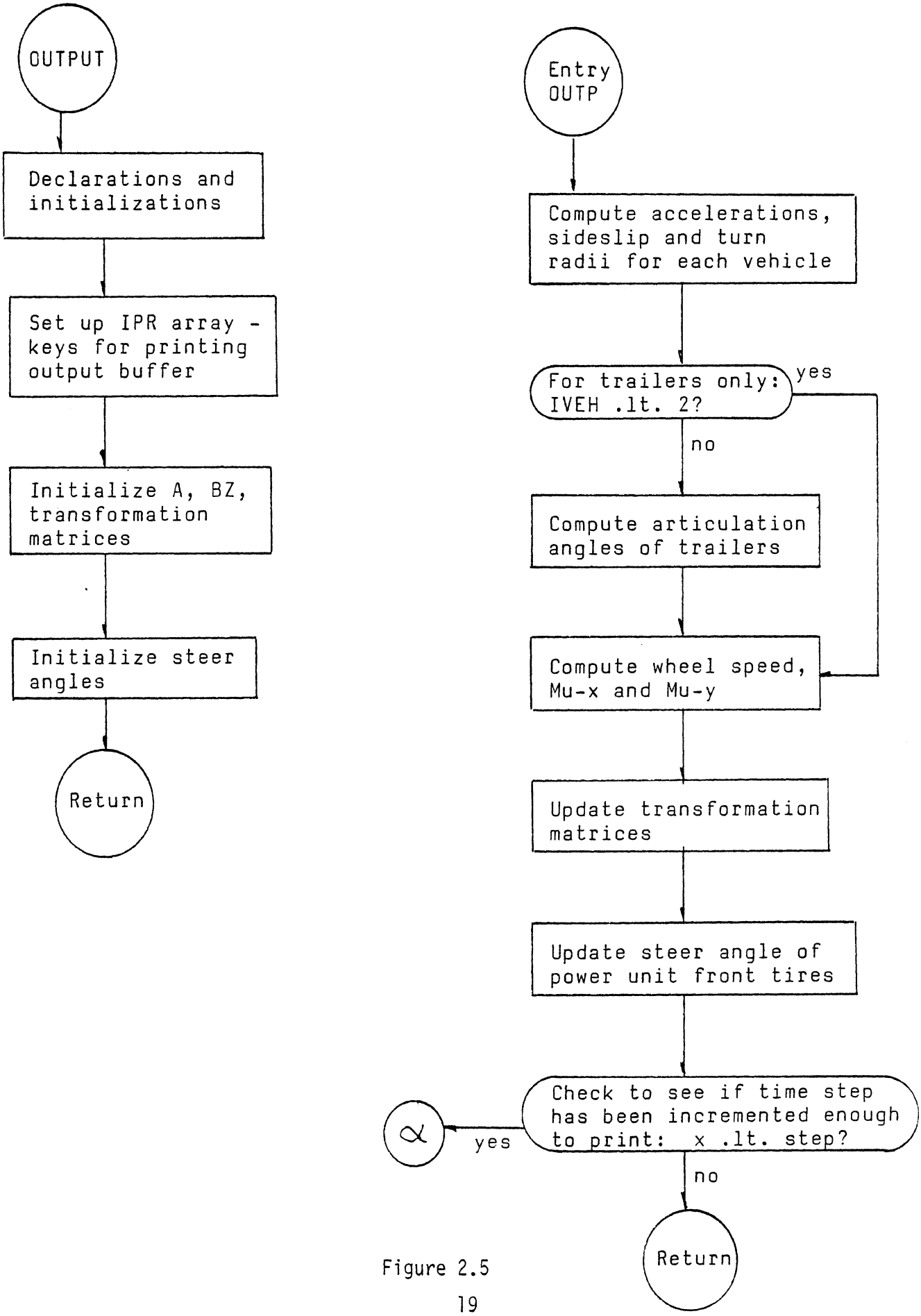


Figure 2.5

Subroutine OUTPUT Flowchart (con't)

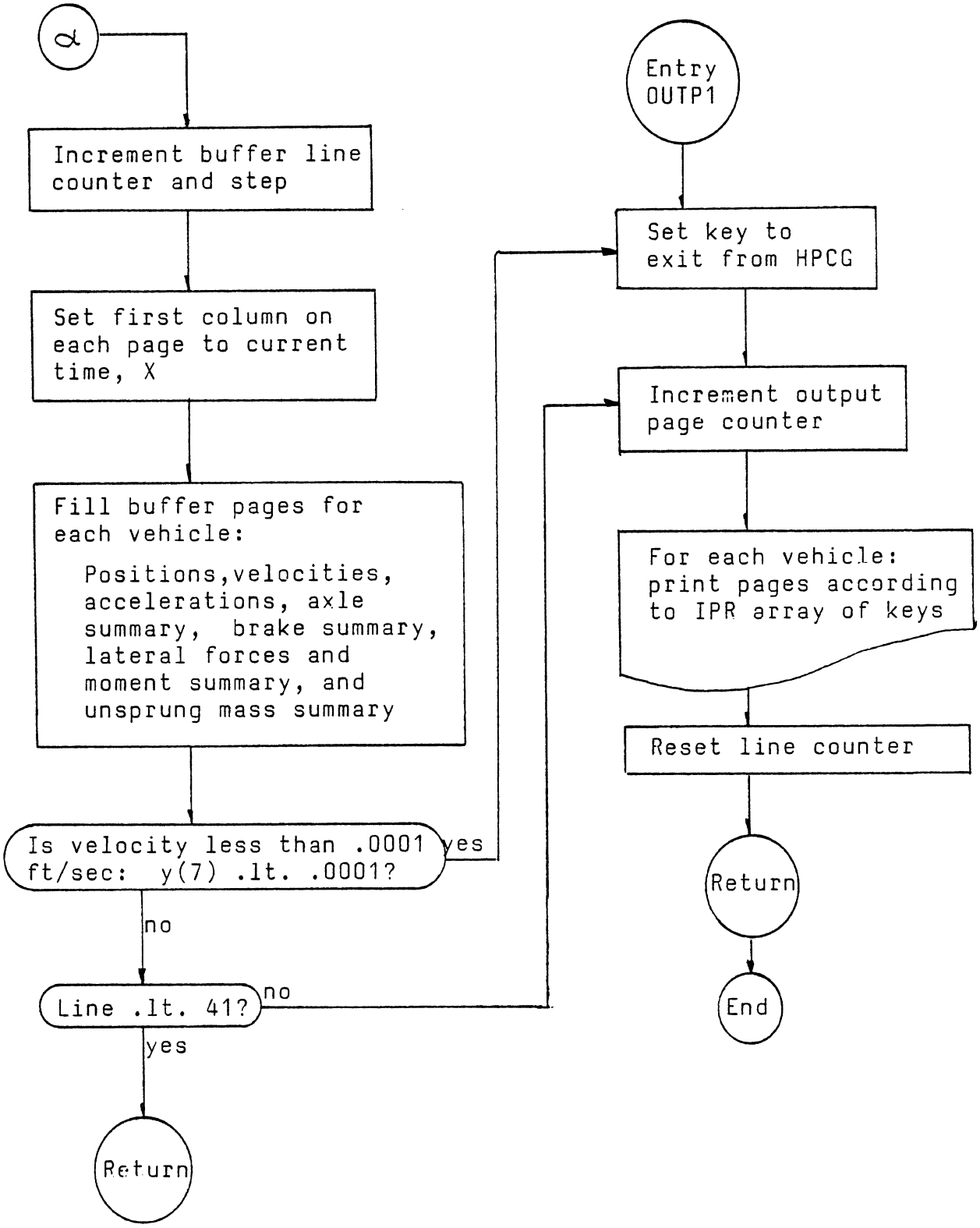


Figure 2.5 (Cont.)

a) Compute accelerations - total longitudinal and lateral and mass center (V1009430 - V1009570)

b) Compute sideslip + turn radii (V1009580 - V100970)

c) For trailers, compute articulation angles (V1009790 - V1009880)

d) For dollies, compute acceleration (V1009890 - V1010050)

e) Compute wheel velocities, Mu_x, Mu_y (V1010060 - V1010230)

f) Update transformation (V1010240 - V1010570)

g) Update steer angles of tractor front tires (V1010580 - V1010750)

h) Set up output buffer (V1010760 - V1012150)

i) Check to see if (1) vehicle has stopped, (2) if buffer is full and needs to be printed (V1012160 - V1012220)

j) Print buffer as described by user code (V1012240 - V1013620)

k) Formats (V1013630 - V1015000)

III. Common Blocks

SPRING, STATIC, INOUT, TOUT, ROADD, BOUT, WSPD, UNSPM, SPMASS, TRANS, CGLOC, FCTOUT, CMACC, TURN, DRIVE, BRAKE, PAGE, KEY, TAND, TIRES, PIN, WHEEL

IV. Library Functions

ABS, ATAN, COS, SIN, SQRT

V. Arguments

Entry OUTP1(X, Y, DERY, IHLF, NDIM, PRMT)

X - Time step from HPCG

Y - Function array

DERY Derivative array

IHLF - No. of time step divisions

NDIM - No. of derivatives

PRMT - Tolerances of HPCG

VI. Subroutines Referenced

DRIVER, TABLE, ROAD

VII. Error Messages

System interrupts only

2.3.4 Subroutine FCT1.

I. Purpose:

a) To compute derivative values for HPCG

II. Program Flow

a) Initializations and declarations (V1015040 - V1016560)

b) Nomenclature list giving the function of all Y(I) and some substitute names for them used in FCT (V1016600 - V1017030)

c) Set up convenient variables to use in place of the Y(I) (V1017070 - V1017160)

d) Compute suspension forces of all suspensions except the dolly. Procedure is as follows:

1) The "Z" position of the sprung mass at the suspension is located. This is SMS.

2) The "Z" velocity of the sprung mass at the suspension is computed. This is SMSD.

3) FCT calls TANDIN. This computes the "Z" velocity and "Z" position of the axle at the suspension location.

4) FCT calls LINE which calculates suspension force based on the relative velocity and position of the suspension (V1017180 - V1018060)

e) Compute derivatives based on straightforward kinematic relationships between certain state variables. For example, for inertial X,
$\dot{X} = u \cdot a(1,1) + v \cdot a(2,1) + w \cdot a(3,1)$
(V1018070 - V1018260)

Subroutine FCT1 Flowchart

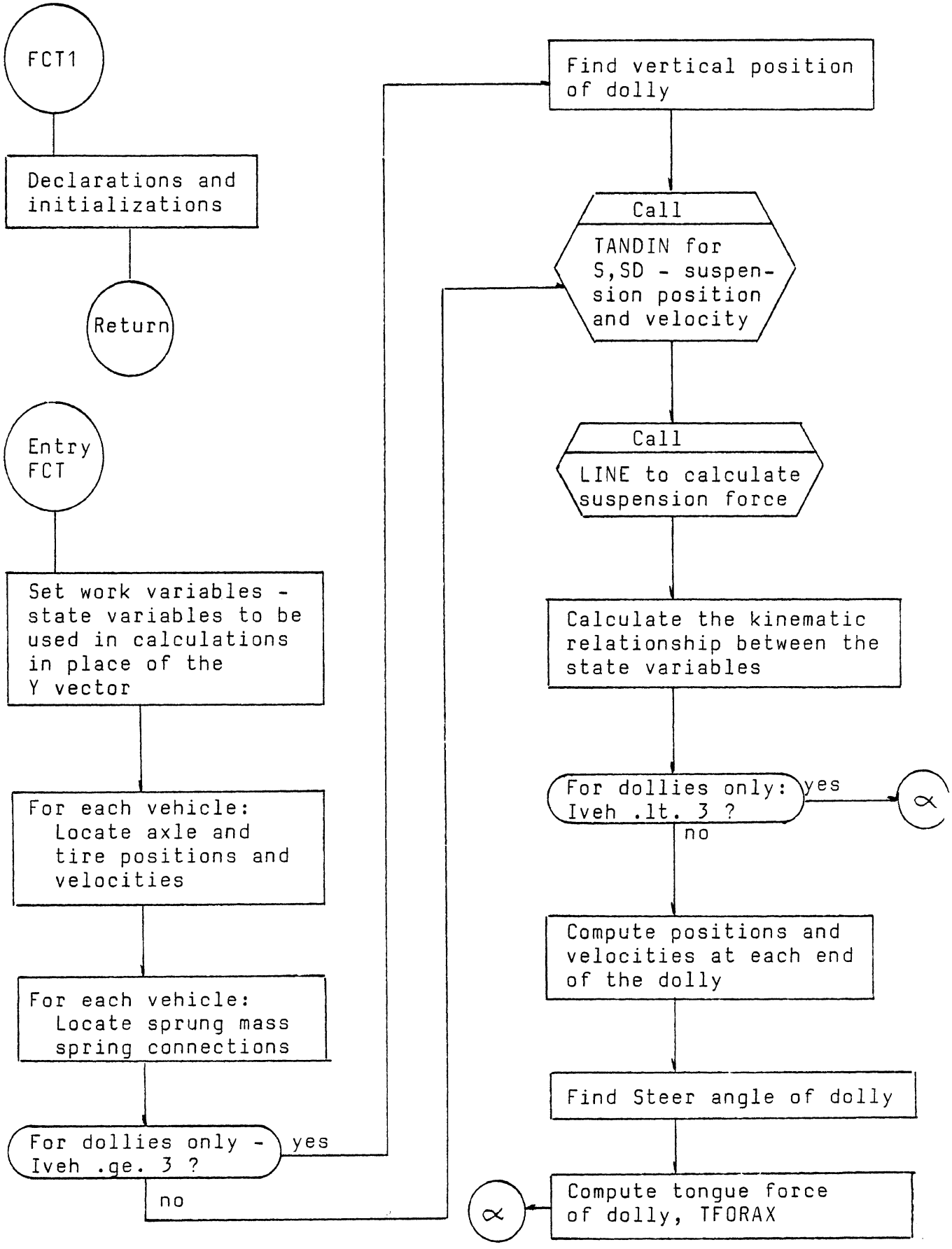


Figure 2.6

Subroutine FCT1 Flowchart (con't)

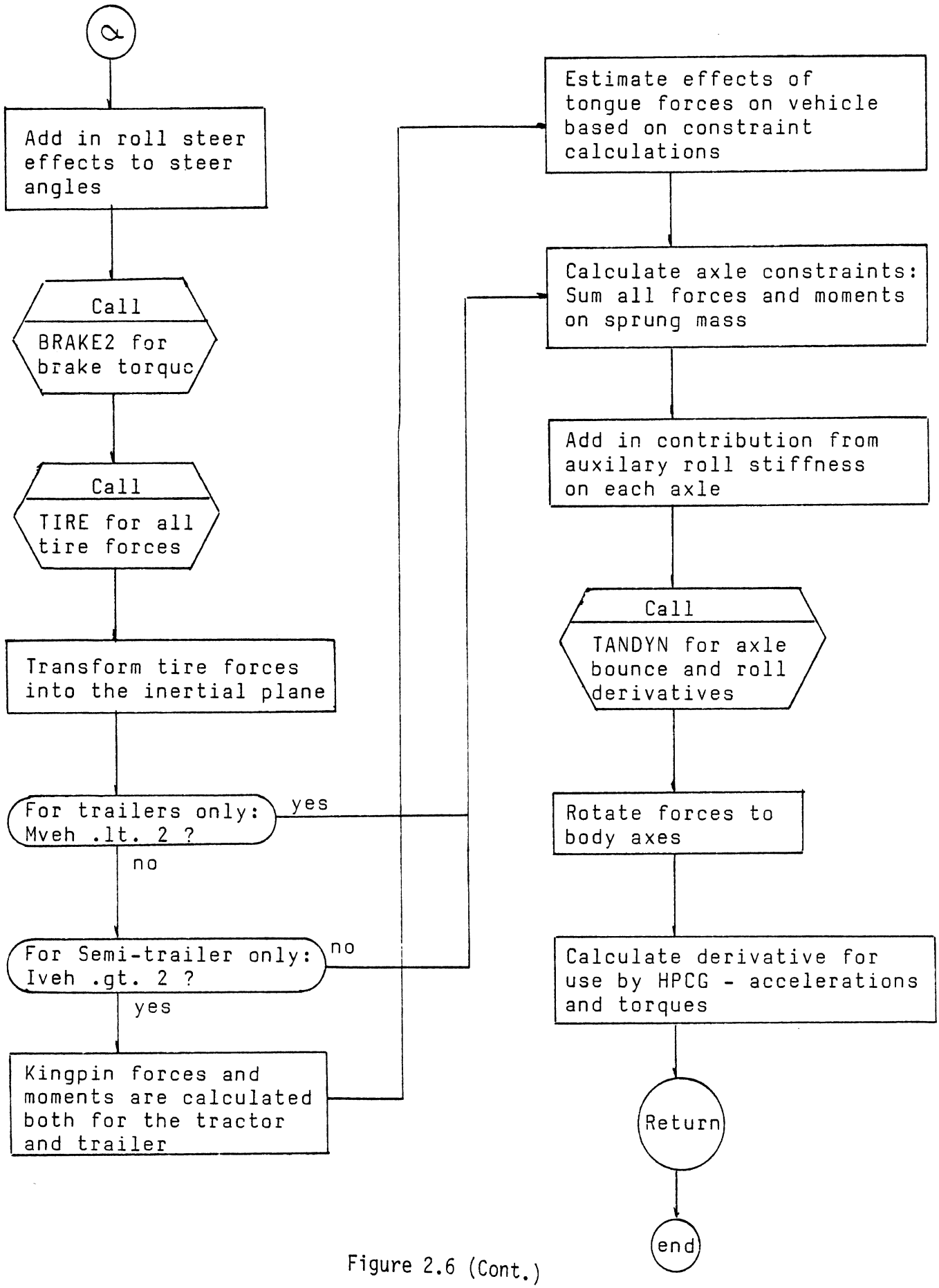


Figure 2.6 (Cont.)

f) Find the deflection and rate of deflection of the dolly length for use in the "spring-dashpot" model. This is done by computing the inertial position and velocity of the pintle hook and the turntable. The position of the turntable is subtracted from the position of the pintle hook and stored in DOL(I). TONGLE is then set to the change from status in yaw plane length of the pintle-table dimension. The relative velocity calculation is put off until after the dolly yaw angle is calculated. (V1018270 - V1018730)

g) Calculation of the dolly steer angle is next. This is done by first computing the yaw angle of the dolly, PSIDOL, assuming the dolly forces along a line from turntable to pintle hook. The steer angle of the dolly is the yaw angle of the dolly minus the yaw angle of the pup trailer. (V1018740 - V1018860)

h) Calculate the component of the relative velocity of the ends of the dolly along the dolly axis. (Note, the ends have velocity along the dolly axis due to "stretching" of the spring-dashpot, and perpendicular to the dolly axis due to dolly rotation.) This calculation includes only the yaw plane components of the velocity. (V1018800 - V1018960)

i) Compute the force, TFORAX, along the dolly axis on the pintle hook. The force is the dolly spring rate times the yaw plane deflection plus the damping times the velocity component along the dolly axis. (V1018970 - V1019030)

j) Initialization of several parameters for use below. Note DO loops start here which go over vehicle, suspension and axle (V1019040 - V1019240)

k) Roll steer calculation. This is the sum of the steer angle plus the input constant, RST, times the (body roll angle - axle roll angle). (V1019250 - V1019330)

l) Call BRAKE for calculation of brake torque for each wheel (V1019350)

m) Call TIRE. All tire slip angles, forces and moments are calculated in TIRE. Each call to TIRE returns answers for left and right side of the axle. Tire forces are then rotated into the body axis coordinate system. (V1019360 - V119470)

n) Calculation of FX, FY, TZ. FX and FY contain the total force in the yaw plane, x and y directions from the tires on the vehicle. TZ contains the moment around the z axis of the forces and moments of the tires on each vehicle. TSUM(IVEH,3) is initialized with tire aligning torques and dual tire moments. (V1019480 - V1019660)

p) More initializations (V1019670 - V19790)

q) Calculate forces and moments at the fifth wheel. This is done by (a) calculating the inertial position of the tractor fifth wheel, KPIN(I); (b) calculating the inertial position of the trailer fifth wheel, TKPIN(I); (c) calculating the respective velocities, VKPIN(I) and VTKPIN(I); (d) calculating the inertial direction forces at the fifth wheel, FPIN(I)—these are the relative positions times the spring rate, KPIN, and the relative velocities times the damping rate, CFW. These are then rotated into the yaw plane forces, FPINX(IVEH) and FPINY(IVEH). Note these are positions along body x and y axes. This loop also contains the roll moment calculation, XMOM. This is simply the relative roll angle times the constant, MC5, plus the relative roll velocity times the constant, CC5. Moments are positive

along the body x axes. Note MC5 = CC5 = 0 gives a "ball hitch," and higher and higher values will tend to keep tractor and trailer roll angles closer and closer to equal. Unreasonably high MC5 or CC5 values will cause numerical problems so one can't really simulate a rigid roll constant. (V1019800 - V120180)

r) FX, FY and TZ store tire, and kingping forces and moments. FSUM and TSUM store only kingpin forces and moments. This concludes the tractor-trailer hitch calculations. (V1020190 - V1020380)

s) Calculation of forces and moments on semi and pup due to the longitudinal dolly force. The force from the front of the dolly on the semi is TFORAX, at the angle GAMMA with respect to the semi, and DELT is the steer angle of the dolly. This will be used in the subsequent estimation of constraint force. It is assumed that the dolly is an integral part of the pup trailer. The forces are added into FXSUM, the moments to TZ. (V1020400 - V1020850)

t) Obtains road gradients and transforms to the body axes coordinate systems. (V1020950 - V1021060)

u) The yaw plane forces FX, FY and moments TZ are calculated. These are now used to calculate the estimated accelerations for the total mass center of each vehicle. (V1021070 - V1021100)

v) Calculate the forces acting on the vehicle sprung mass at each roll center. The procedure is as follows:

   1) Estimate the acceleration of an unsprung mass center based on assumption of motion in yaw plane only.

   2) Force of constraint between sprung and unsprung mass plus shear forces at tire/road interface

equal unsprung mass times unsprung mass acceleration. This equation is used to find the unknown constraint force based on known shear force and estimated acceleration.

The constrained forces computed are XAXFOR and YAXFOR. (V1021110 - V1021330)

w) The constrained forces and moments are added to the sprung mass sums. These forces and moments are in the "yaw plane" system, i.e., they are yawed from inertial but not rolled or pitched. Note that these do not include dollies which have the specialized algorithm given next. (V1021340 - V1021440)

x) The forces of constraint between dolly-semitrailer and dolly-pup are calculated here. The forces on the dolly-semitrailer are TFORAX, TFORAY, and TFORAZ. All of these are in the dolly yaw plane body axis system. TFORAX is known based on the tongue's "stretch," and is calculated above. TFORAZ is found by summing moments about the dolly's y axis at the turntable for the converter dolly only. TFORAY is found by summing moments about the z axis at the dolly turntable. (V1021450 - V1021780)

y) Add in the roll moment due to the roll of the sprung mass about the roll axis. (V1021790 - V1021980)

z) Add in the roll moment due to auxiliary roll stiffness. Note each axle has its own independent auxiliary roll stiffness. (V1021990 - V1022150)

aa) Call TANDYN to calculate all axle bounce and roll derivatives. (V1021160 - V10222220)

bb) Translational equations of motion are calculated. The BZ matrix transforms forces, FSUM, from the unsprung mass coordinate system to the sprung mass coordinate system. (V1022230 - V1022360)

cc) Longitudinal and lateral gravitational forces due to road gradients are added to the translational force terms. (V1022370 - V1022510)

dd) Euler rotational equations are calculated. (V1022520 - V1022710)

ee) Program returns to HPCG. (V1022720 - V1022730)

III. Common Blocks

DUAL, KEY, TAND, SPMASS, BRAKE, TURN, ROADD, CGLOC, STATIC, TIRE3, USPM, FCTOUT, PIN, CMACC, SPRING, TRANS, BOUT

IV. Library Functions

ABS, ARSIN, ATAN, COS, SIN, SQRT

V. Arguments

FCT1(Y) where Y is the array of initial conditions of HPCG functions

FCT(X,Y,DERY) where X is simulation time step from HPCG
Y is array of functions from HPCG
DERY is array of derivatives from HPCG

VI. Subroutines Referenced

BRAKE1, LINE, TANDEM, TIRE1

VII. Error Messages

System interrupts only

2.3.5 Subroutine TANDEM.

I. Purpose:

a) Read and echo suspension and axle parameters, convert units from in., deg., sec., to ft., radian, slugs

b) Calculate spring deflections and velocities.

c) Calculate derivatives for axle bounce and roll equations.

II. Program Flow

a) Declarations (V1022760 - V1023130)

b) Initialization of constants (V1023140 - V1023180)

Subroutine TANDEM Flowchart

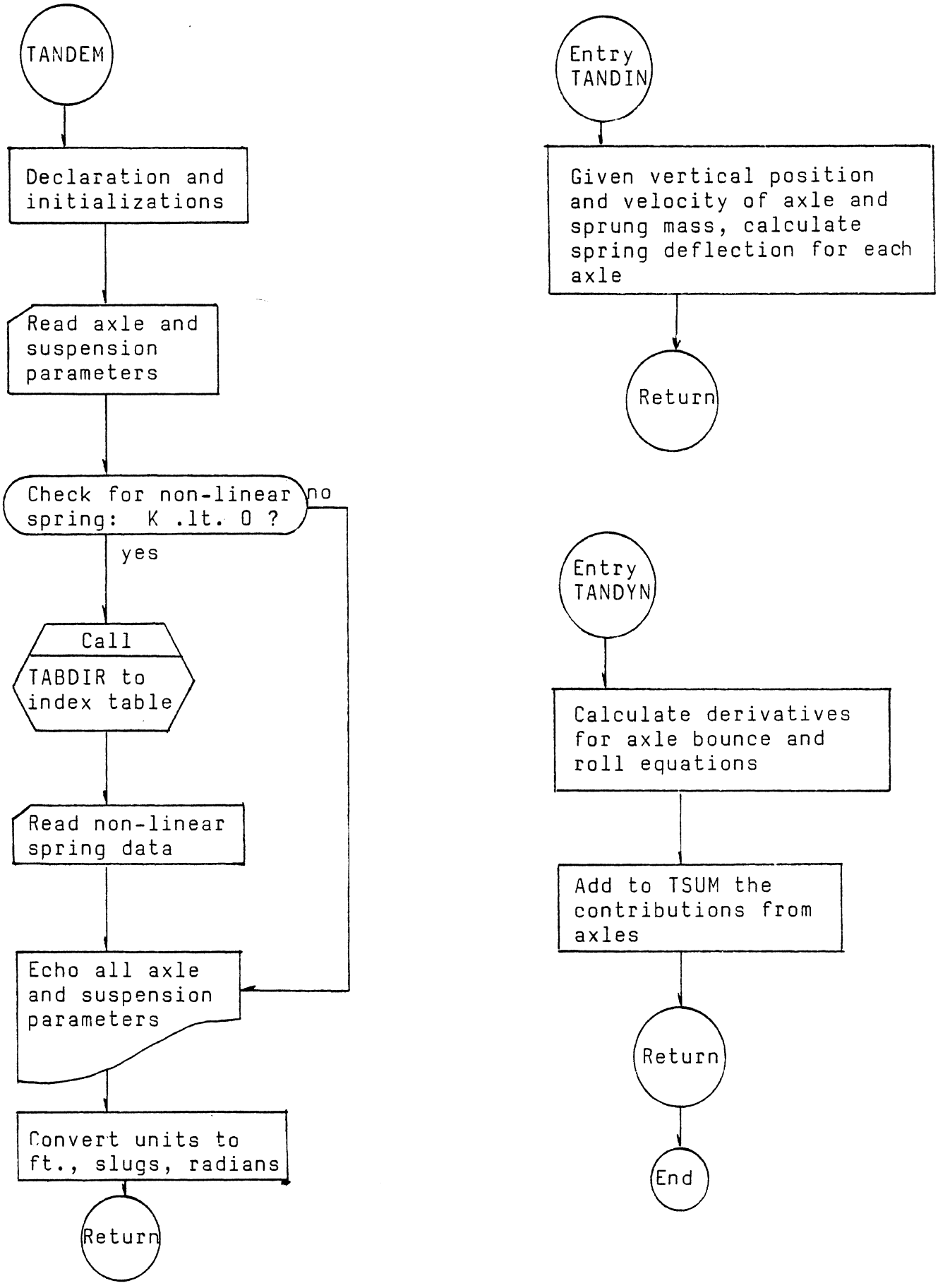


Figure 2.7

c) Read and echo parameters (V1023190 - V1024220)

d) Convert units (V1024230 - V1024390)

e) Formats (V1024400 - V1025140)

f) Calculation of deflections and velocities (V1025150 - V1025220)

g) Calculation of DERY's (V1025230 - V1025530)

III. Common Blocks

BOUT, TAND, SPRING, TURN, PAGE, TIRES, SPMASS, KEY, STATIC, UNSPM, CGLOC

IV. Library Functions

ABS, SIN, COS

V. Arguments

TANDEM (IVEH,ISUS)

IVEH - Unit No.

ISUS- Suspension: 1 = front, 2 = rear

Entry TANDIN (IVEH,ISUS,KAX,LSIDE,SMS,SMSD,SIGN)

IVEH - Unit No.

ISUS- Suspension: 1 = front, 2 = rear

KAX - Axle No.: 1 = leading tandem, or single axle,
2 = trailing tandem

LSIDE - Side of Axle: 1 - left, 2 = right

SMS - Sprung Mass Vertical Displacement, Positive is Down

SMSD - d(SMS)/dt

SIGN - $\pm$ 1

Entry TANDYN (IVEH,ISUS,Y,DERY,XBAR,XXS)

IVEH - Unit No.

ISUS- Suspension

Y - HPCG Function Array

DERY - HPCG Derivative Array

XBAR - Work Matrix Containing Positions of IVEH

XXS - Locations of Axle WRT C.G.

VI. Subroutines Referenced

TABDIR

VII. Error Messages

System interrupt only

2.3.6 Subroutine TIRE1.

I. Purpose:

a) Read tire data if tire tables are used.

b) Duplicate tire data if the same tire tables are used for different tires.

II. Program Flow

a) Declarations (V1025580 - V1025850)

b) Read data (V1025860 - V1026250)

c) Duplicate data (V1026260 - V1026710)

III. Common Blocks

PAGE, SLOPES, TIRES, KEY, WHEEL, TIRTAB

IV. Library Functions

None

V. Arguments

TIRE1(IU,IS,IA,ILR,IXY)

IU - Unit No.
IS - Suspension Location
IA - Axle Position
ILR - Left or Right Side
IXY - Mu-x v slip or Mu-y v alpha data

TIRDUP(IU,IS,IA,ILR,IT1D,JT1D,KT1D,LTkD,IXY)

IU - Unit No.

IS - Suspension Location
IA - Axle Position
ILR - Side
IT1D, JT1D, KT1D, LT1D - Corresponding Indices for Data to be duplicated
IXY - Mu-x or MU-y data

Subroutine TIRE1 Flowchart

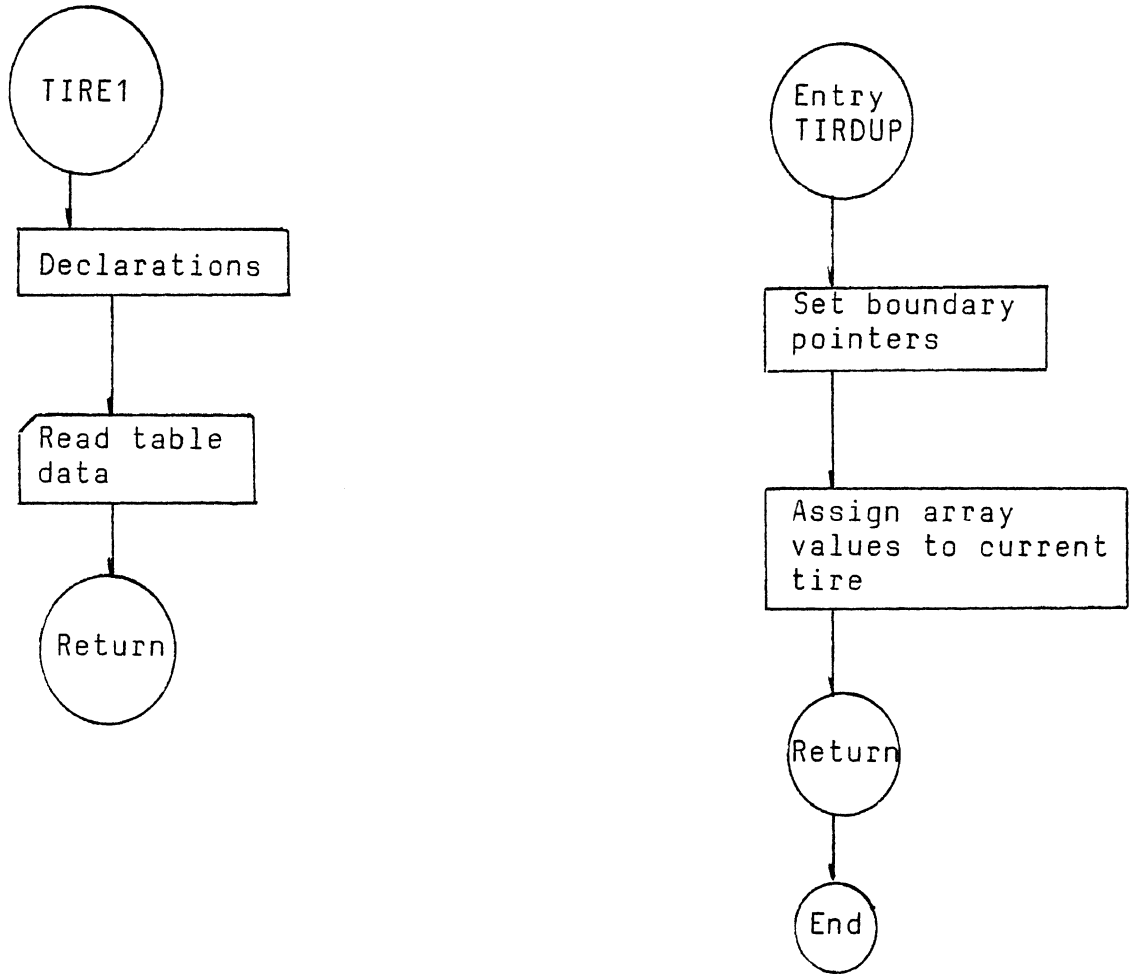


Figure 2.8

VI. Subroutines Referenced

None

VII. Error Messages

System interrupt only

2.3.7 Subroutine TIRINI.

I. Purpose:

a) Read and echo all tire data - determine if tables are to be used, convert units

b) Perform longitudinal and lateral tire force, longitudinal wheel slip and aligning moment calculations.

II. Program Flow

a) Calculations (V1026730 - V1027300)

b) Zero initializations (V1027340 - V1027460)

c) Read and echo tire data. If tables are used, call appropriate subroutines to read and echo tables. (V1027470 - V1028400)

d) Convert units (V1028410 - V1028660)

e) Formats (V1028670 - V1029200)

f) Entry point for tire force, slip and moment calculations (V1029220)

g) Variable initialization (V1029230 - V1029280)

h) Locate x-y location of wheel and obtain road surface elevation at that position if ROAD is used. (V1029290 - V1029470)

i) Calculate vertical tire load, lateral and longitudinal wheel velocities, and sideslip angle of tire. (V1029480 - V1029700)

j) Calculate longitudinal wheel slip. (V1029710 - V1030000)

Subroutine TIRINI Flowchart

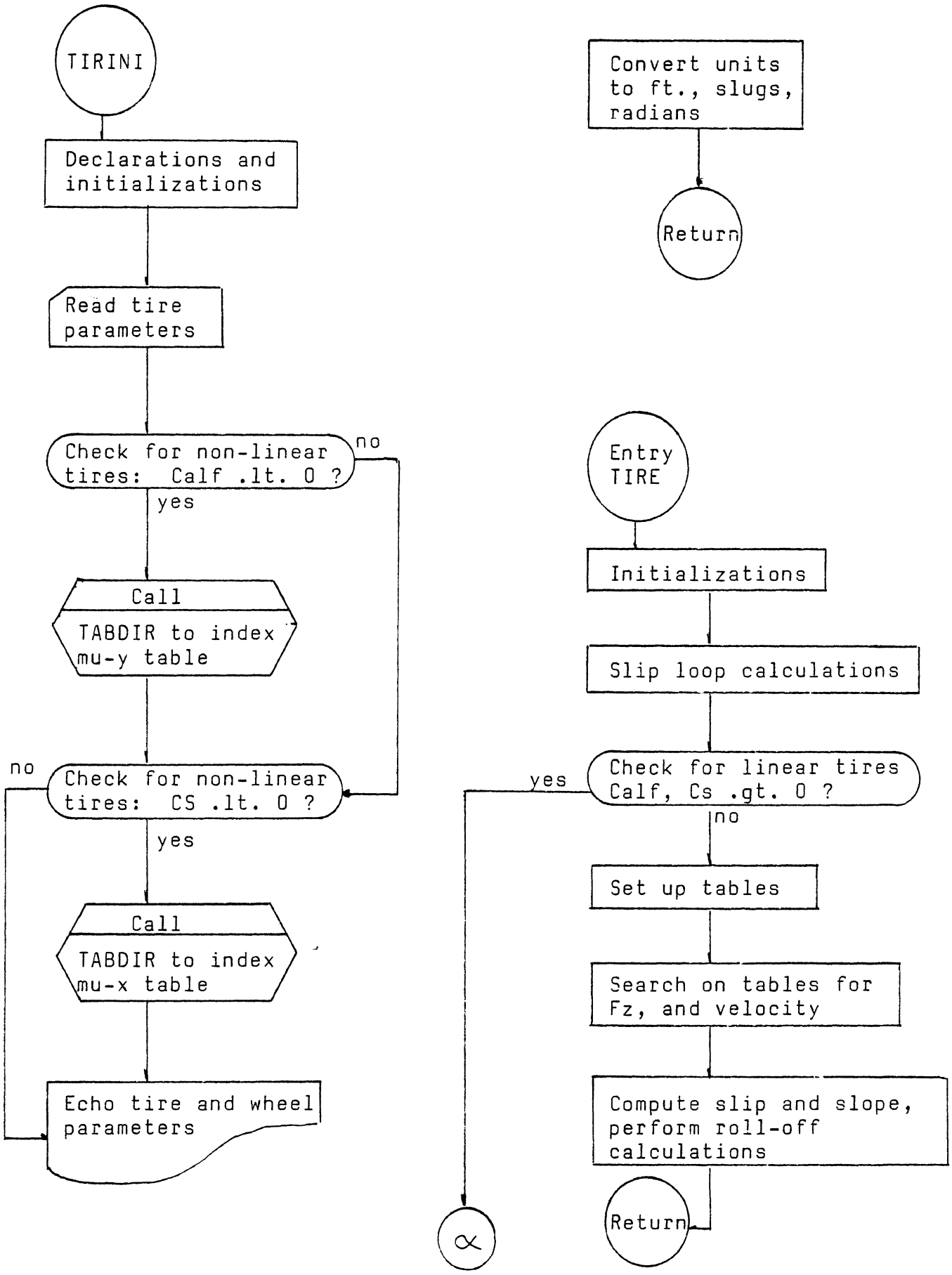


Figure 2.9

Subroutine TIRINI Flowchart (con't)

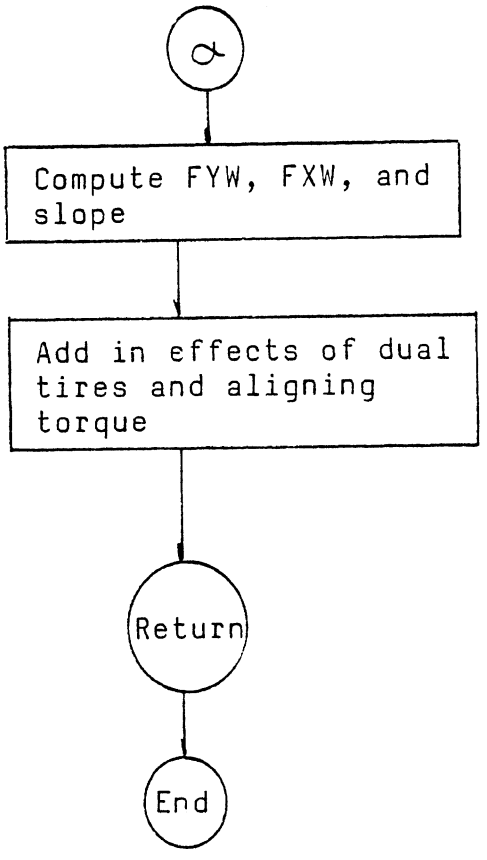


Figure 2.9 (Cont.)

k) Branch to 660 or 670 if linear tire model is used. (V1030010 - V1030030)

l) Initialize dummy variables of table search interpolation.
V1 = longitudinal wheel slip (IXY=1)
= tire sideslip angle (IXY=2)
V2 = vertical tire load
V3 = wheel translational velocity
V4 = tire sideslip angle (IXY=1)
= longitudinal wheel slip (IXY=2)
(V1030040 - V1030170)

m) Search vertical load tables for upper and lower loads enclosing current load. (V103180 - V1030310)

n) Search speed tables for upper and lower speeds enclosing current speed. (V1030320 - V1030450)

o) Determine number of loops required for subsequent calculations. (V1030460 - V1030590)

p) Locate four lower bounds for V1 variable (longitudinal slip/sideslip angle) corresponding to each load-speed combination (V1030600 - V1030950)

q) Locate four upper bounds for V1 variable. (V1030960 - V1031050)

r) Interpolate for V1 variable. Local slopes with respect to V1 variable are also calculated here. (V1031050 - V1031390)

s) Interpolate for V3 table variable (wheel translational velocity) at each load. Slopes with respect to V1 are also interpolated at each load. (V1031400 - V1031530)

t) Interplation for V2 table variable (tire load) and calculation of corresponding friction coefficient, RMU. Final slopes with respect to V1 are also interpolated here. (V1031540 - V131660)

u) Longitudinal roll-off table function look-up for V1 and V4. Final calculation of longitudinal friction coefficient RMU using roll-off table factors ROLLX. Current RMU saved is RMUO for wheel slip calculations. (V1031670 - V1031790)

v) Calculation of longitudinal tire force from tabular data (V1031800)

w) Lateral roll-off table function look-up for values V4,V1. Final calculation of lateral friction coefficient, RMU, using roll-off table factor, ROZY. (V1031810 - V1031870)

x) Calculation of lateral tire force. (V1031880 - V1031900)

y) Calculation of aligning moment. (V1031930 - V1319340)

z) Check performed for dual tires. (V1031960 - V1031970)

aa) Calculation of lateral tire force using linear tire model. Check performed for dual tires. (V1032020 - V1032220)

III. Common Blocks

PAGE, STATIC, SPRING, TURN, ROADD, SLOPES, TIRES, UNSPM, SPMASS, PIN, FCTOUT, KEY, CMACC, WHEEL, WSPD, DUAL, TIRTAB

IV. Library Functions

ABS, ATAN, COS, EXP, SIGN, SIN, SQRT

V. Arguments

TIRINI (IVEH,ISUS)

IVEH - Unit

ISUS- Suspension Location

Entry TIRE (IU,IS,IA,ILR,ISY,T,DT,SRS,XXS,DERY,TALIGN,X)

IU,IS,IA,ILR - Tire Location by Unit, Suspension, Axle and Side

FXY - Mu-x or Mu-y Table

T - Brake Torque

DT - d(t)/dt

XXS,SRS Are Fore/Aft Locations of Each Wheel with Respect to Sprung Mass c.g.

DERY - HPCG Derivatives

TALIGN - Returned Value of Aligning Torque

X - Time

VI. Subroutines References

ROAD, TABIN, TABLXY

VII. Error Messages

System interrupt only

2.3.8 Subroutine BRAKE1.

I. Purpose:

a) Read and echo brake parameter, convert units

b) Interpolate for treadle pressure and brake pressure. If antilock is used, call ANTILOCK routine, return brake torque.

II. Program Flow

a) Declarations (V1032270 - V1032550)

b) Initialization (V1032630 - V1032750)

Subroutine BRAKE1 Flowchart

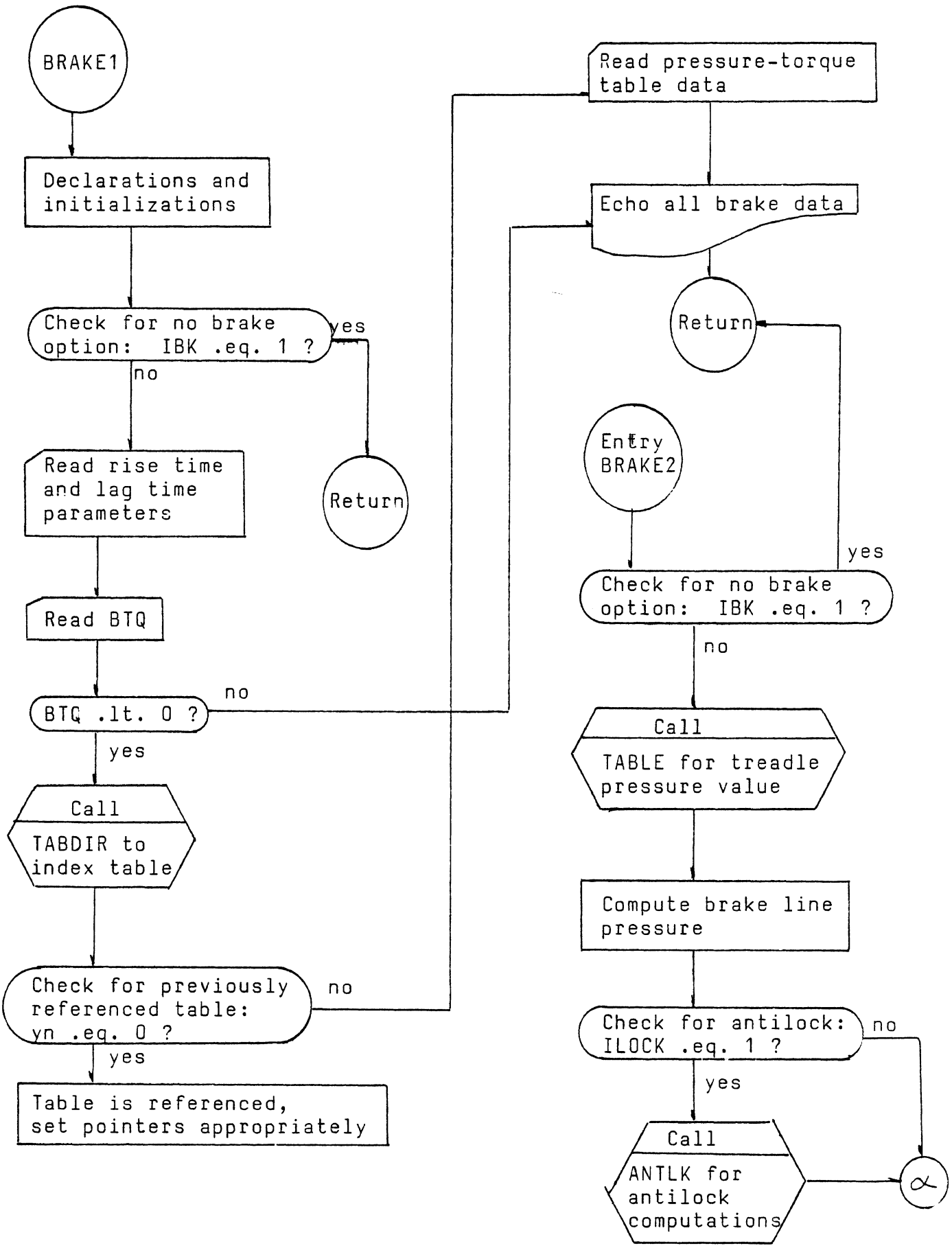


Figure 2.10

Subroutine BRAKE1 Flowchart (con't)

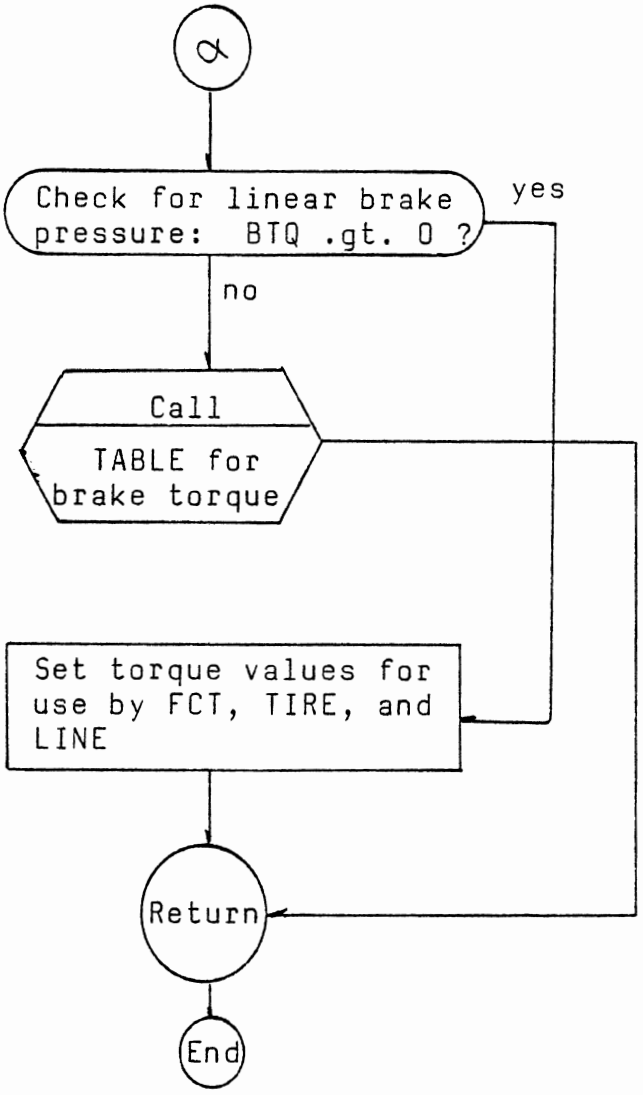


Figure 2.10 (Cont.)

c) Read and echo brake parameters (V1032770 - V1033420)

d) Convert units (V1033430 - V1033520)

e) Formats (V1033530 - V1033850)

f) Find treadle pressure,

g) Find brake pressure, check for antilock (V1033890 - V1034110)

h) Brake torque calculations (V1034170 - V1034380)

III. Common Blocks

PAGE, FCTOUT, CMACC, ANTLK, KEY, WSPD, BRAKE, TIRES, BOUT

IV. Library Functions

EXP

V. Arguments

BRAKE1(IVEH)

IVEH - Vehicle No.

BRAKE2(IU,IS,IA,ILR,XXS,X)

IU - Vehicle No.
IS - Suspension
IA - Axle
ILR - Side
XXS - Location of Axles WRT c.g.
X - Time

2.3.9 Subroutine LINE.

I. Purpose:

To calculate suspension forces (SF) for each side of each axle.

II. Program Flow

a) Declaration (V1034430 - V1034520)

b) Check for spring table (V1034530)

Subroutine LINE Flowchart

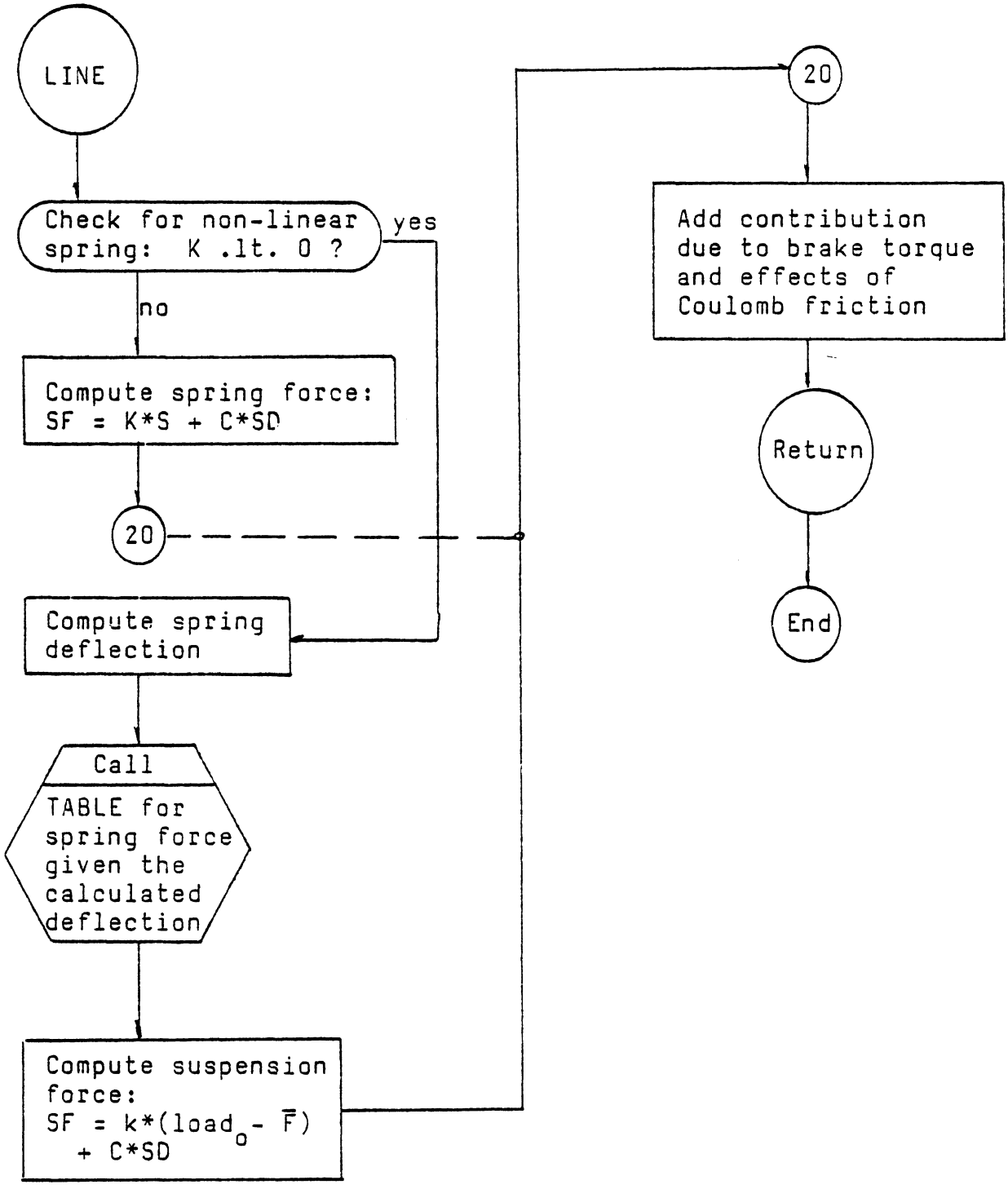


Figure 2.11

c) If linear springs, calculate spring force (V1034540 - V1034560)

d) For nonlinear springs, find spring deflection, interpolate to final force by calling TABLE (V1034570 - V1034650)

e) Add coulomb friction contributions, contribution from brake torque. (V1034660 - V1034810)

III. Common Blocks
BOUT, TAND, KEY, SPRING

IV. Library Functions
ABS

V. Subroutines Referenced
TABLE

VI. Error Messages
System interrupt only

2.3.10 Subroutine TABLE.

I. Purpose:

Given a table with X values and corresponding Y values, the routine will interpolate to find a Y' value for any X' value. If X' is outside the range of X, the last Y value is assigned to X'.

II. Program Flow

a) For a one-dimensional table, set increments (V1034880 - V1034910)

b) For a two-dimensional table, set increments (V1034920 - V1034950)

c) Determine if X' is within range of X. If yes, compute corresponding Y' value and return; if no, return last Y value. (V1034960 - V1035080)

Subroutine TABLE Flowchart

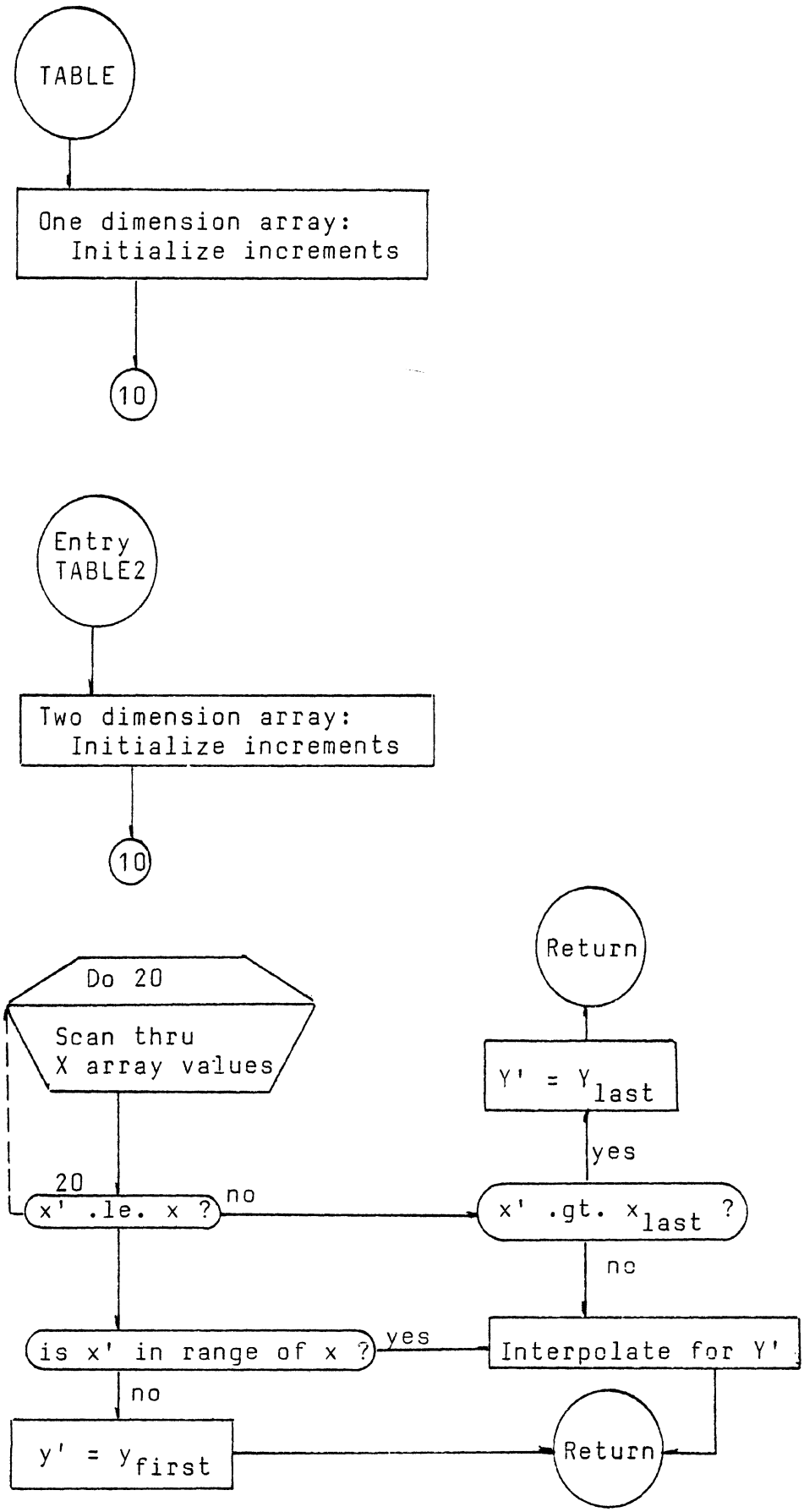


Figure 2.12

III. Common Blocks

KEY

IV. Library Functions

None

V. Arguments

TABLE(M,N,X,Y,Z,Q)

TABLE(M,N,X,Y,Z,Q,IVEH)

M - initial point
N - end point
X - X array
Y - Y array
Z - value input X
Q - returns Y
IVEH - Vehicle No.

2.3.11 Subroutine TABLXY.

I. Purpose:

To return interpolated values from roll-off table given XYROLX and XYROLY as functions of longitudinal and lateral slip.

II. Program Flow

a) Determine if X_1' and X_2' are within range of table. (V1035140 - V1035200)

b) Compute returned values and return. (V1035210 - V1035550)

III. Common Blocks

None

IV. Library Functions

None

V. Subroutines Referenced

None

VI. Error Messages

System interrupt only

Subroutine TABLXY Flowchart

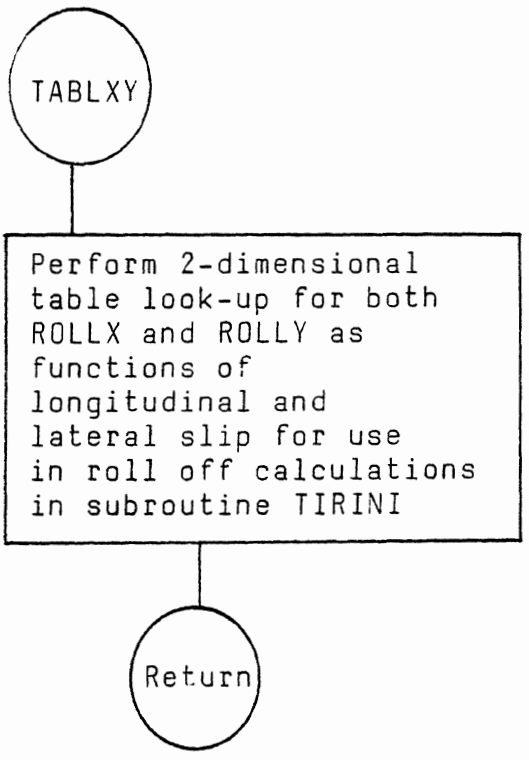


Figure 2.13

2.3.12 Subroutine DRIVE1.

I. Purpose:

a) Read, echo and initialize closed-loop steer parameters.

b) Perform calculations to achieve trajectory as described by closed-loop steer parameters.

II. Program Flow

a) Declarations (V1035590 - V1035900)

b) Initialize variables and calculate simplified interval vehicle model parameters. (V1035910 - V1035960)

c) Read and echo program user input parameters: transport lag, maximum time for preview interval. (V1035970 - V1036090)

d) Initialize parameters. (V1036100 - V1036340)

e) Update current vehicle forward velocity and check for advance in time step. (V1036350 - V1036400)

f) Perform initial x-y path coordinate transformation from incremented "small heading angle" coordinate system to the inertial system. (V1036410 - V1036440)

g) Initialize variables. (V1036450 - V1036560)

h) Calculate interval vehicle model parameters and transition matrices. (V1036570 - V1037260)

i) If vehicle velocity varies by more than 10 ft/sec from interval vehicle model, update interval model and transitional matrices. (V1037270)

j) Update time, error squared measure and "small heading angle" state vector, Yc. (V1037280 - V1037310)

Subroutine DRIVE1 Flowchart

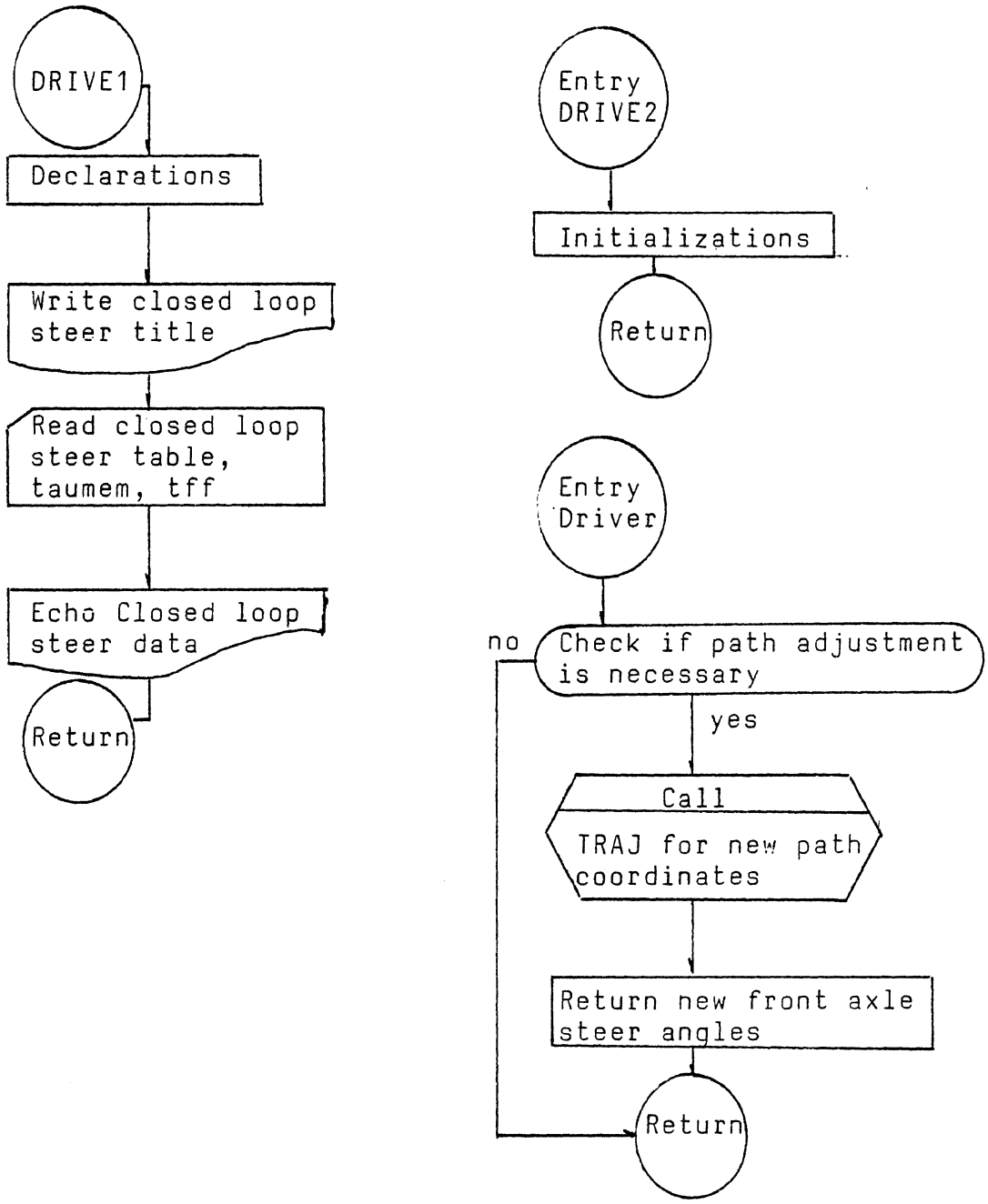


Figure 2.14

k) Update path coordinates in "small heading angle" coordinate system if difference between vehicle heading angle and last "small heading angle" direction update is greater than 0.1 radians. (V1037320 - V1037390)

l) Locate vehicle position in "small heading angle" coordinate system and update corresponding state vector. (V1037400 - V1037420)

m) Initialize variables to zero. (V1037430 - V1037450)

n) Sampling rate check. (V1037470)

o) Calculate preview position errors at NTF points in preview interval and sum. (V1037480 - V1037650)

p) Calculate closed-loop steering angle. Constrain calculated steer to value <DMAX. > -DMAX. (V1037660 - V1037680)

q) Calculate transport lagged steer angle response. If input lag, TAUMEM, is specified too large, an error message will result with program termination. (V1037690 - V1037810)

r) Store current time for time step and sampling rate checks. (V1037820 - V1037860)

III. Common Blocks

PAGE, SLOPES, KEY, SPMASS, TIRES, FCTOUT, STATIC

IV. Library Functions

ABS, COS, SIGN, SIN, SQRT

V. Arguments

DRIVE1(ISTEER)

ISTEER - total number of points in the closed-loop trajectory. (Note: this number will be negative)

Entry DRIVER(X,Y,DFW)

X - current simulation time

Y - a 5-vector containing the vehicle's current lateral position, lateral velocity, yaw rate, heading angle and longitudinal position.

DFW - calculate closed-loop steer angle returned to the calling program.

VI. Subroutines Referenced

TIRE, TRAJ, GMADD*, GMPRD*, SMPY*, LOC*

VII. Error Messages

*****TAUMEM PROBABLY TOO LARGE*****

Caused by user input for driver transport lag being too large.

2.3.13 Subroutine TRAJ.

I. Purpose:

a) Calculate the lateral displacement of the desired path for a given forward distance. The lateral path displacement is used by DRIVE1 subroutine to calculate preview errors between the desired path and future estimates of vehicle position.

II. Program Flow

a) Locate forward distance, X, in XT vector and interpolate to find YPATH. (V1037930 - V1038050)

III. Common Blocks

PAGE

IV. Library Functions

None

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*IBM SSP Subroutines

Subroutine TRAJ Flowchart

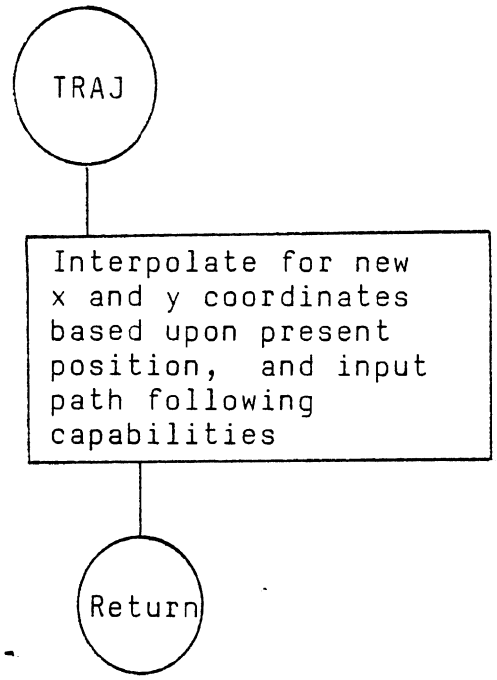

Figure 2.15

V. Arguments

TRAJ(X,XT,YT,YPATH,V)

X - specified forward distance

XT,YT - vector pair of coordinates defining desired path

YPATH - calculated lateral position returned to calling program

V - vehicle forward velocity

VI. Error Messages

System interrupt only

2.3.14 Subroutine TABIN.

I. Purpose:

a) Establish a directory of tables used, by number and type.

b) Set pointers or duplicate tables as needed.

c) Echo table input.

II. Program Flow

a) Declarations and initializations (V1038100 - V1038400)

b) Determine if a table is listed. (V1038570 - V1038610)

c) If table is not listed, list number and update counter. (V1038620 - V1038840)

d) If table is listed, return pointer values. If it is Mu-x or Mu-y table, call TIRDUP. (V1038850 - V1038970)

e) If table is incorrectly categorized, write error message and terminate program. (V1038980 - V1039010)

f) Echo all tables. (V1039040 - V1040970)

III. Common Blocks

PAGE, SPRING, BRAKE, TIRTAB

IV. Library Function

None

Subroutine TABIN Flowchart

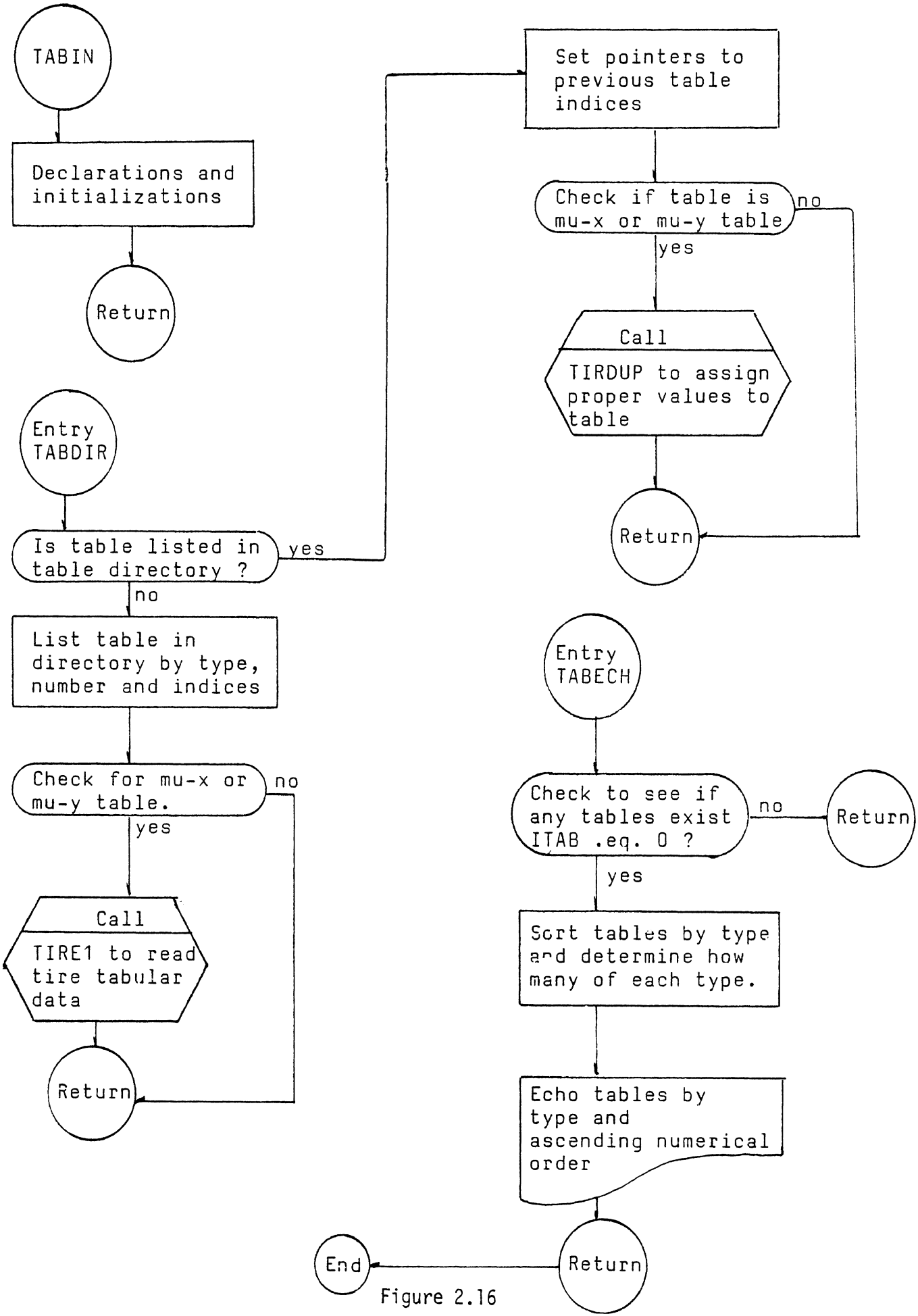

Figure 2.16

V. Arguments

Entry TABDIR(TN,IVEH,JSUS,KAX,LSIDE,IV,IS,KA,LS,YN,ITYPE)

TN - Table No.

IVEH,JSUS,KAX,LSIDE - Vehicle indices passed to TABIN

IU,IS,KA,LS - Vehicle indices returned

YN - Duplicate key returned

ITYPE - Table type

VI. Subroutines Referenced

TIRDUP, TIRE1

VII. Error Messages

*****ERROR RETURN*****

*****ATTEMPT TO ASSIGN PREVIOUS TABLE TYPE XX TO A TYPE YY TABLE*****

Cause: Table number has previously been used for a different type of table.

2.3.15 Subroutine ANTLKR.

I. Purpose:

a) Read and echo antilock parameter data for each wheel or axle.

b) For each time step, perform calulations for modulating brake pressure in response to wheel speed, processed by user-defined antilock control logic and pressure modulator characteristics.

II. Program Flow

a) Declarations (V1040980 - V1041560)

b) Check to see if the desired system is previously referenced. (V1041570 - V1041700)

c) Read antilock data for current wheel. See Appendix C for input stream order. (V1041710 - V1043190)

Subroutine ANTLKR Flowchart

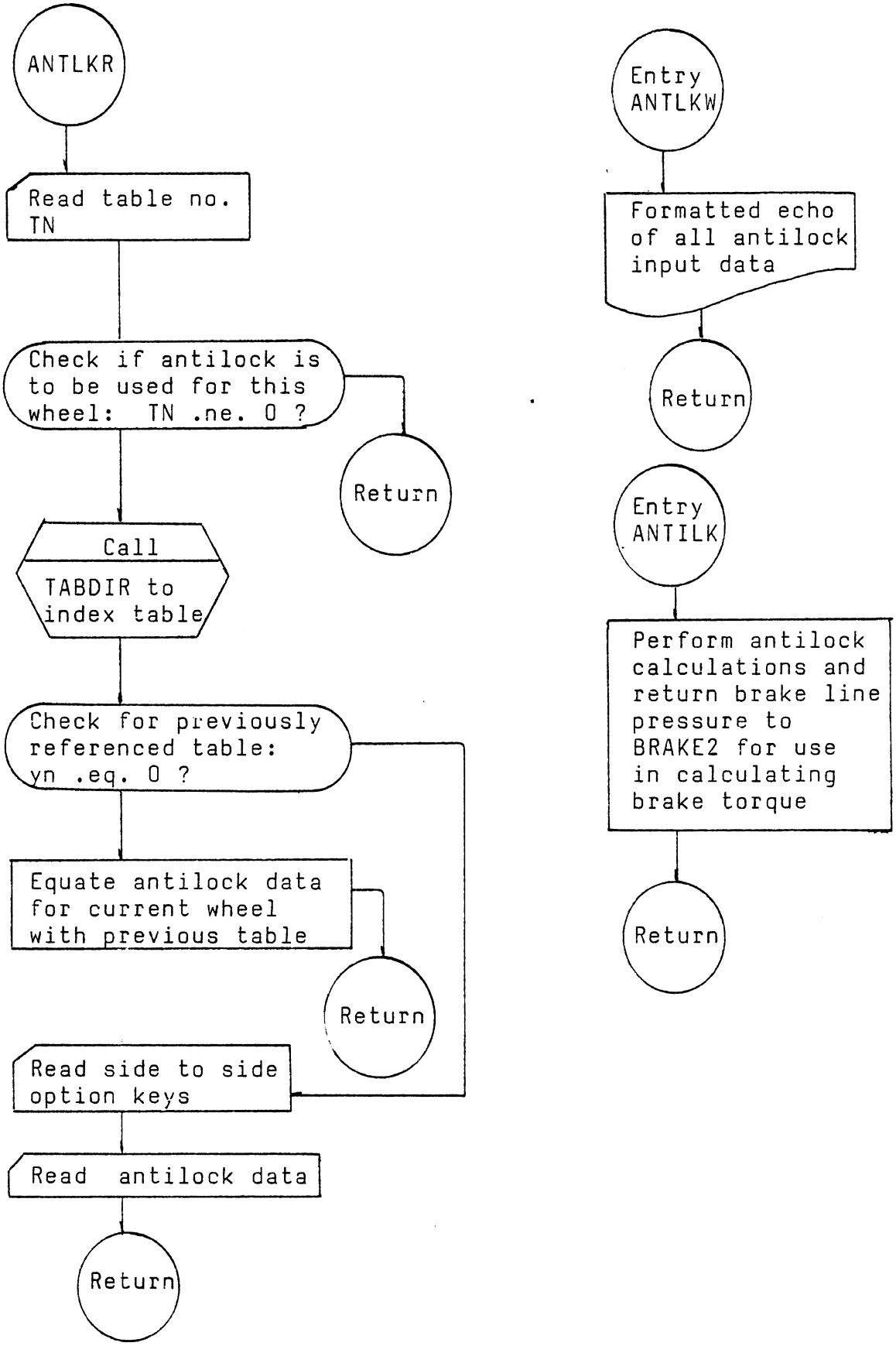

Figure 2.17

d) Check for antilock data duplication. (V1043200 - V1043220)

e) Duplicate current wheel antilock data with data previously read. (V1043230 - V1044350)

f) Variable initialization. (V1044360 - V1044390)

g) Print out antilock dictionary of available variables. Echo table of adaptive antilock variables and rules selected by the program user. Echo table of non-adaptive parameters selected by the program user. (V1044400 - V1047690)

h) Variable initializations and forward time step check. (V1047700 - V1047780)

i) Side-to-side option checks. (V1047790 - V1047960)

j) One-time variable initialization. (V1047970 - V1049130)

k) Update variables each time step. (V 1049140 - V1049890)

l) Permanent return from antilock if demanded treadle pressure is less than 1 psi or vehicle velocity is less than 7 ft/sec. (V1049900 - V1049910)

m) Wheel speed sensor calculations—two cascaded first-order filters and differentiator to derive internal wheel speed and wheel acceleration. (V1049920 - V1049990)

n) Identification of maximum and minimum wheel speed and acceleration values during the last two cycles. (V1050000 - V1050360)

o) Check for logic sampling rate control. (V1050370 - V1050500)

p) Check for pulse-width modulation option. (V1050510 - V1050560)

q) Pulse-width modulation option calculations. (V1050570 - V1051220)

r) Check for "one-shot" option and associated calculations. (V1051230 - V1051600)

s) Check for general purpose counter option and associated GPV evaluations. (V1051610 - V1051730)

t) Check for general purpose variable option and associated GPV evaluations. (V1051740 - V1051900)

u) Update wheel speed and acceleration storage locations and evaluate wheel lock indicator/times. (V1051910 - V1052020)

v) Check for current pressure ON/OFF status and branch. (V1052030 - V1052050)

w) OFFT = 1 => First OFF inequality satisfied. TAU1 is programmed lag in control logic between first and second OFF inequality evaluations. (V1052060)

x) Return to calling program and save current variable calculation in VARIB. (V1052070 - V1052750)

y) Evaluate inequality expressions used in the control logic.

I = 1-4 : Pressure OFF conditions

I = 5-8 : Pressure ON conditions

(V1052760 - V1053050)

z) Check first and second "OFF" inequalities for $\geq$ condition. Store results in logic variables QL1, QL2. (V1053060 - V1053290)

aa) Evaluate 3rd and 4th inequality expressions for $\geq$ condition. Store results in logical variables QL3, QL4. (V1053300 - V1053470)

bb) Evaluate logical expression involving QL1...QL4 to determine value of QOFF. QOFF = TRUE => Release Brake Pressure (GO TO Statement 12)
(V1053480 - V1053690)

cc) Store pressure and wheel spin conditions at initiation of current OFF command. (V1053700 - V1053810)

dd) Check brake pressure release transport lag and number of cycles > 1 condition. (V1053820 - V1053960)

ee) Variable initializations used in pressure calculation. (V1053870 - V1053890)

ff) Evaluate inequality expression associated with exponential pressure fall. (V1053900 - V1054010)

gg) Evaluate inequality expression associated with linear pressure fall. (V1054020 - V1054130)

hh) Evaluate inequality expression associated with treadle pressure modulation option. (V1054140 - V1054250)

ii) Assign exponential decay rate based upon evaluation of exponential inequality expression.
(V1054260 - V1054290)

jj) Assign linear pressure decay rate based upon evaluation of linear pressure fall inequality expression.
(V1054300 - V1054330)

kk) Assign demanded pressure during pressure fall.
(V1054340 - V1054370)

ll) Store time and maximum pressure values from last two cycles at time of a new pressure release.
(V1054380 - V1054430)

mm) Calculate returned brake pressure (release portion of cycle) using exponential and/or linear terms. Limit lower bound of pressure to 0. (V1054440 - V1054450)

nn) Set flags and check control logic delay TAU2. (V1054460 - V1054530)

oo) ONT = 1 => First ON inequality expression satisfied. TAU3 is programmed control logic delay between evaluation of first and second ON inequality expression. (V1054540 - V1054550)

pp) Evaluate first and second control logic ON inequality expressions. Save results in logical variables QL5 and QL6. (V1054560 - V1054800)

qq) Evaluate third and fourth control logic ON inequality expressions. Save results in logical variables QL7 and QL8. (V1054810 - V1054980)

rr) Evaluate complete ON logical expression involving QL5, QL6, QL7, and QL8. Save result in QON. QON = TRUE => Re-apply brake pressure. (V1054990 - V1055330)

ss) Elapsed time < transport lag for ON cycle; continue with pressure release calculation. (V1055340 - V1055350)

tt) Initialize variables for use in pressure rise calculation. (V1055360 - V1055400)

uu) Evaluate inequality expression associated with exponential pressure rise characteristic and assign exponential pressure rise rates. (V10555410 - V1055520)

vv) Evaluate inequality expression associated with linear pressure rise characteristic and assign linear pressure rise rates. (V1055530 - V1055640)

ww) Check treadle pressure modulation option key. If IPDKEY > -1, evaluate expression for treadle pressure modulation and assign as demanded pressure. (V1055650 - V1055770)

xx) Save time and minimum pressure values for last two cycles at initiation of new cycle. (V1055780 - V1055810)

yy) Calculate returned brake pressure (pressure rise portion of antilock cycle) using exponential and/or linear terms. Limit upper bound of pressure to demanded pressure. (V1055820 - V1055830)

zz) Set flags and check control logic programmed delay TAU4. (V1055840 - V1055860)

aaa) Prevent antilock operation for demanded treadle pressure < 1.0 psi or vehicle velocity < 7.0 ft/sec. (V1055900 - V1055960)

bbb) Calculation of all general form arithmetic expressions used by the antilock program except for the eight inequality expressions used in the control logic. Index I > 23 is an error condition. (V1055970 - V1056280)

III. Common Blocks

PAGE, ANTLK

IV. Library Functions

ABS, EXP, IABS, SIGN

V. Arguments

Entry ANTLKR(IU,IS,IA,ILR), Entry ANTLKW(IU,IS,IA,ILR)

IU - Unit No.
IS - Suspension location
IA - Axle position
ILR - Side

Entry ANTILK(WLR,WRR,WV,WVD,DP,PP,PRET,IJK,T)

WLR - Left wheel speed
WRR - Right wheel speed
WV,WVD - Vehicle speed, acceleration
PP - Current brake pressure
PD - Current demanded treadle pressure
PRET - Returned brake pressure
IJK - Single digit integer representation of IU,IS,IA,ILR
T - Simulation time

VI. Subroutines Referenced

PRINT, TABIN

VII. Error Messages

System interrupt only

2.3.16 Subroutine PRINT.

I. Purpose:

a) Echo antilock input variables and their selected coefficients appearing in any antilock arithmetic expression.

II. Program Flow

a) Declarations (V1056330 - V1056500)

b) Detect adaptive coefficients (V1056510 - V1056540)

c) Print descriptive name for each new arithmetic expression. (V1056550 - V1056590)

d) Branch to appropriate code based on number of adaptive variables for a specific coefficient. (V1056600)

e) No adaptive variables. Echo coefficient and variable I.D. code. (V1056610 - V1056650)

f) One adaptive variable. Echo coefficients and variable I.D. codes. (V1056660 - V1056710)

g) Two adaptive variables. Echo coefficients and variable I.D. codes. (V1056720 - 1056760)

h) Set NEW key to 0; return. (V1056770 - V1056780)

III. Common Blocks

PAGE

IV. Library Functions

IABS

Subroutine PRINT Flowchart

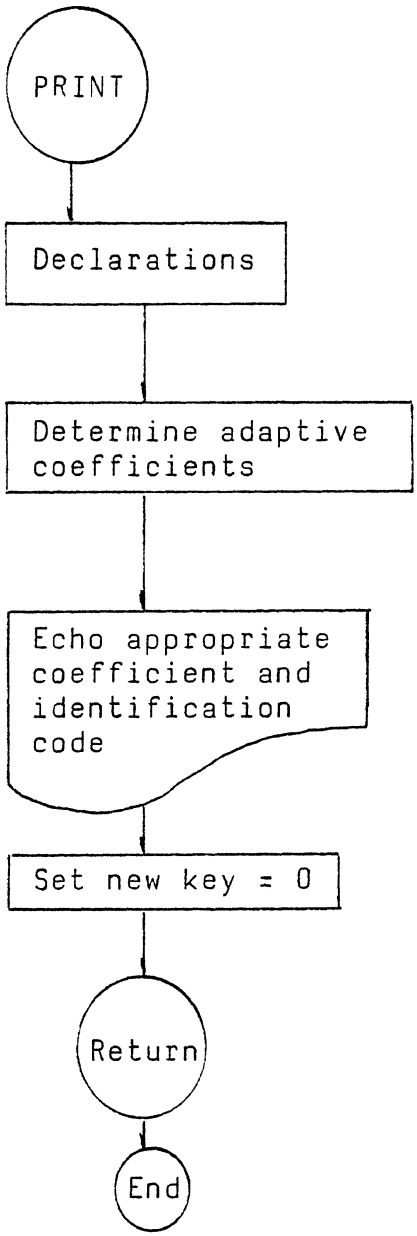

Figure 2.18

V. Arguments

PRINT(BUF,IBF,I,J,NEW)

BUF - buffer with three adaptive coefficients and two break points possible

IBF - variable identification code appearing in user dictionary

I - arithmetic expression index

J - coefficient order index

NEW - new expression flag

VI. Subroutines Referenced

None

VII. Error Messages

System interrupt only

2.3.17 Subroutine ROAD. Subroutine ROAD is a user-written program which permits a road surface, Z, to be specified as a function of X-Y inertial coordinates. ROAD has two entry points: ROAD and ROADDZ. Entry point ROAD calculates the vertical (inertial) elevation of the road surface given an X-Y horizontal location. Entry ROADDZ calculates the cross-slope and down-slope of the specified road surface at a given X-Y horizontal location.

Arguments for ROAD: X, Y, Z, T. X is the inertial "x" (forward) coordinate at time, T, equal to zero; Y is the inertial "y" (lateral) coordinate at T=0; and Z is the calculated inertial "z" (vertical) coordinate of the road normal to the X-Y plane.

Arguments for entry ROADDZ: X, Y, DZDX, DZDY. X, Y are the inertial horizontal coordinates supplied by the calling program; DZDX and DZDY are the calculated slopes of the road surface along the X and Y coordinate directions (inertial).

```
SUBROUTINE ROAD (X,Y,Z,T)
(User-written program calculating Z as a function of X,Y)
RETURN
ENTRY ROADDZ (X,Y,DZDX,DZDY)
```

```
(User-written program calculating the inertial road
slopes dZ/dX and dZ/dY, defined by the user in ROAD.)

RETURN
END
```

2.4 Input/Output Structure

2.4.1 Input. The simulation program has been designed for batch mode operations, requiring only one input device and one output device. The I/O device assignments are set in MAIN. As written, the program uses the device assigned to 5 for Input and 6 for Output.

The following tables of input variables will assist the user in structuring data sets. More explicit information pertaining to I/O structure can be found in the User's Manual [6]. The user is also directed to Appendix B (source list) and Appendix A (variable dictionary). Note that at the end of each subroutine source list a cross-reference index map of all variables referenced in the subroutine is printed.

Table 2.1. Parameter Data Formats.

Variable Name	Subscript Range	Units	Format	
HEAD	(20)		20A4	Simulation Operation Parameters
NVEH			I2	
VEL		ft/sec	F15.3	
ISTEER			I3	
Closed-Loop Option				
XP,YP	(100), (100)	ft	2F10.2	
TAUMEM		sec	F10.4	
TFF		sec	F10.4	
Open-Loop Option				
TURNX,TURNY,TURNY(I+25)	(50), (50)	sec,deg,deg	3F10.2	
NTP	(2,2)		I2	
XTP,YTP	(10), (10)	sec, psi	2F10.2	
TIMF		sec	F15.3	
TINC		sec	F15.3	
Road Option				
IROAD,DZDXO*,DZDYO*		-,%,%	I2,F10.2*	
IOUT	(7)		7I1	
Doubles/Triples				Vehicle Parameters
KDOLLY	(4)		I2	
APHI	(4)	in	F15.3	
BB1	(4)	in	F15.3	
D	(4)	in	F15.3	
WHBS	(4)	in	F15.3	
SNL	(4,2)	in	F15.3	
SNL	(4,2)	in	F15.3	
DELTA	(4)	in	F15.3	
VJ	(4,3)	in-lb-sec^2	F15.3	
PW	(4)	lb	F15.3	
Payload Option				
PX	(4)	in	F15.3	
PZ	(4)	in	F15.3	
PJ	(4,3	in-lb-sec^2	F15.3	

*only if IROAD > 0

Table 2.1. (Cont.)

Variable Name	Subscript Range	Units	Format	
Tractor-Trailer Option				
BB1	(4)	in	F15.3	Vehicle Parameters
D	(4)	in	F15.3	
MC5		in-lb	F15.3	
Doubles/Triples Option				
A3	(4)	in	F15.3	
PH	(4)	in	F15.3	
KEY	(4,2)		I2	Suspension and Axle Parameters
Tandem Axle Option				
TD	(4,2)	in	F15.3	
FSPLIT	(4,2)	%	F15.3	
FSHIFT	(4,2)	%	F15.3	
K*	(4,2,2,2)	lb/in	2F15.3	
Nonlinear Spring Option				
NOSPR	(4,2,2,2,2)		I2	
FORSPR,DEFSPR	(320), (320)	in,lb	2F10.2	
C*	(4,2,2,2)	lb	2F15.3	
CF*	(4,2,2,2)	lb	2F15.3	
JA	(4,2,2)	in-lb-sec^2	F15.3	
RCI	(4,2,2)	in	F15.3	
RST	(4,2,2)	deg/deg	F15.3	
KRS	(4,2,2)	in-lb/deg	F15.3	
SYI	(4,2,2)	in	F15.3	
TRA	(4,2,2)	in	F15.3	
ASW	(4,2,2)	lb	F15.3	

*Side-to-side option - zero or blank entry of right side will assign left side value to right - see Section 2.4.7.

Table 2.1. (Cont.)

Variable Name	Subscript Range	Units	Format	
DTS*	(4,2,2,2)	in	2F15.3	Tire and Wheel Parameters
CALF*	(4,2,2,2)	lb/deg	2F15.3	
MU-Y vs. ALPHA Option				
NTABXY	(4,2,2,2,2,2)		I2	
FZBRK	(4,2,2,2,2,6)	lb	3F10.2	
NTABXY	(4,2,2,2,2,2)		I2	
VBRK	(4,2,2,2,2)	ft/sec	3F10.2	
NMAXU1	(4,2,2,2,6,3)		I2	
V1BRK,UXY	(4,2,2,2,6,3,10) (4,2,2,2,10,6,3)	deg,in	2F10.2	
NIRY			I2	
X1ROLY	(10,4,2,2,2)		2F10.2	
N2RY			I2	
X2ROLY	(10,4,2,2,2)		2F10.2	
XYROLY	(10,10,4,2,2,2)		10F10.2	
CS*	(4,2,2,2)	lb/slip	2F15.3	
MU-X vs. Slip Option				
Same as MU-Y vs. ALPHA				
CAM*	(4,2,2,2)	lb/deg	2F15.3	
CAT*	(4,2,2,2)	lb	2F15.3	
KT*	(4,2,2,2)	lb/in	2F15.3	
SRAD*	(4,2,2,2)	in	2F15.3	
WHEELI*	(4,2,2,2)	in-lb-sec^2		
TQ*	(4,2,2,2,2)	sec	2F10.4	Brake
BTQ*	(4,2,2,2)	in-lb/psi	2F10.2	
Pressure-Torque Table Option				
NUM	(4,2,2,2,2)		I2	
XX,YY	(320), (320)	psi,in-lb	2F10.2	
ILOCK			I2	
Antilock Option				
(See Appendix D, User's Manual)				
NEXT			I2	

2.4.2 Output Structure. (Refer to Section 2.3.3 "Subroutine Output.) To accommodate the minimization of output devices, as the simulation progresses, variables that are to be output are categorically stored in one output buffer. When this buffer is filled (after 41 time increments set by the user), the buffer is printed onto the output device. The program requires a print device to be capable of printing 132 characters per line. If the simulation has not met terminating conditions, the buffer line counter is reinitialized and the simulation continues, again filling the buffer. When the simulation meets terminating conditions, the partially filled buffer is printed to assure that all data generated is output. Should a fatal error occur that causes a system interrupt, the buffer does not print and any collected data will be lost. Under normal simulation conditions, this is, however, unlikely to occur.

For each simulation, the output of interest to the user may vary. Thus, the program has available an output option (see Section 2.5.5) which allows the user to eliminate the printing of unnecessary information.

2.5 Program Options

The T3DRS:V1 program is written in a general form which allows the user many options. By his choice of options, the user can vary the degree of sophistication of the simulation to best suit his needs. The following 13 sections describe each option and the parameters involved in the selection of each option. More detailed information about the parameter format and data flow can be found in Section 2.4.1 and in the User's Manual [6].

2.5.1 Vehicle Configuration. The program has the capability to simulate four different vehicle configurations:

1) straight truck (or bobtail tractor)
2) tractor-semitrailer
3) tractor-semitrailer-full trailer (doubles)
4) tractor-semitrailer-two full trailers (triples)

The vehicle configuration is set by the first numeric input parameter, NVEH. The value of NVEH corresponds to the total number of trailers to be simulated (NVEH = 0 implies a straight truck). If a configuration involving trailers is to be used, additional vehicle parameters must be entered, as well as additional suspension, tire and brake data. Figure 2.19 shows the vehicle parameters necessary to describe a straight truck. Figure 2.20 is the vehicle parameter list of a tractor followed by a semitrailer. Note that additional information describing the fifth wheel must be included for the tractor-trailer. The additional parameters are inserted following the payload parameters. These are:

BB1 - distance of fifth wheel ahead of tractor rear suspension (in)

D - height of fifth wheel above ground (in)

MC5 - fifth wheel stiffness (in-lb/deg)

When a full trailer is used (either for doubles or triples), additional vehicle parameters must be included for the preceding trailer as well as for the full trailer. The parameters to be added to the preceding trailer (Figures 2.21, 2.22) describe the pintle hook location. They are inserted following the payload description parameters:

A3 - distance from pintle hook to rear suspension (in)

PH - height of pintle hook above ground (in)

For a full trailer, the following parameters describing the dolly must be inserted before the wheelbase (Figure 2.23).

KDOLLY - dolly type: 1 for converter dolly, 2 for fixed dolly

APHI - distance from pintle hook to turntable center (in)

BB1 - turntable offset ahead of dolly suspension (in)

D - height of turntable above ground (in)

2.5.2 Steer Mode. The simulation can operate in either open-loop or closed-loop steering modes by inputting either (1) an open-loop, time versus front-wheel steer angle table or (2) a closed-loop X-Y path-follower table. The choice of open- or closed-loop steering is determined by the value of input variable ISTEER which is the steer

TRUCK PARAMETERS

WHEELBASE - DISTANCE FROM FRONT AXLE TO CENTER OF REAR SUSPENSION (IN)	142.00
BASE VEHICLE CURB WEIGHT ON FRONT SUSPENSION (LB)	9073.80
BASE VEHICLE CURB WEIGHT ON REAR SUSPENSION (LB)	10519.20
SPRUNG MASS CG HEIGHT (IN, ABOVE GROUND)	47.90
SPRUNG MASS ROLL MOMENT OF INERTIA (IN-LB-SEC**2)	33852.00
SPRUNG MASS PITCH MOMENT OF INERTIA (IN-LB-SEC**2)	120000.00
SPRUNG MASS YAW MOMENT OF INERTIA (IN-LB-SEC**2)	120000.00
PAYLOAD WEIGHT (LB)	24907.00
PAYLOAD DISTANCE AHEAD OF REAR SUSPENSION CENTER(IN)	6.00
PAYLOAD CG HEIGHT (IN, ABOVE GROUND)	70.25
PAYLOAD ROLL MOMENT OF INERTIA(IN-LB-SEC**2)	7485.00
PAYLOAD PITCH MOMENT OF INERTIA(IN-LB-SEC**2)	50896.00
PAYLOAD YAW MOMENT OF INERTIA(IN-LB-SEC**2)	54422.00

Figure 2.19

TRACTOR PARAMETERS

WHEELBASE - DISTANCE FROM FRONT AXLE TO CENTER OF REAR SUSPENSION (IN)	142.00
BASE VEHICLE CURB WEIGHT ON FRONT SUSPENSION (LB)	8900.00
BASE VEHICLE CURB WEIGHT ON REAR SUSPENSION (LB)	7116.00
SPRUNG MASS CG HEIGHT (IN, ABOVE GROUND)	39.70
SPRUNG MASS ROLL MOMENT OF INERTIA (IN-LB-SEC**2)	18166.00
SPRUNG MASS PITCH MOMENT OF INERTIA (IN-LB-SEC**2)	69555.00
SPRUNG MASS YAW MOMENT OF INERTIA (IN-LB-SEC**2)	69555.00
PAYLOAD WEIGHT (LB)	40600.00
PAYLOAD DISTANCE AHEAD OF REAR SUSPENSION CENTER(IN)	50.00
PAYLOAD CG HEIGHT (IN, ABOVE GROUND)	64.50
PAYLOAD ROLL MOMENT OF INERTIA(IN-LB-SEC**2)	375000.00
PAYLOAD PITCH MOMENT OF INERTIA(IN-LB-SEC**2)	1727000.00
PAYLOAD YAW MOMENT OF INERTIA(IN-LB-SEC**2)	1727000.00
FIFTH WHEEL LOCATION (IN, AHEAD OF REAR SUSP. CENTER)	0.0
FIFTH WHEEL HEIGHT ABOVE GROUND (IN)	47.50
5TH WHEEL STIFFNESS (IN-LB/DEG)	2500000.00

Figure 2.20

```
TRAILER NO. 1 PARAMETERS
------------------------
     WHEELBASE - DISTANCE FROM KINGPIN TO CENTER OF REAR SUSPENSION (IN)          383.00
     BASE VEHICLE KINGPIN STATIC LOAD (LB)                                       2815.00
     BASE VEHICLE CURB WEIGHT ON REAR SUSPENSION (LB)                            8650.00
     SPRUNG MASS CG HEIGHT (IN. ABOVE GROUND)                                      74.80
     SPRUNG MASS ROLL MOMENT OF INERTIA (IN-LB-SEC**2)                          66224.00
     SPRUNG MASS PITCH MOMENT OF INERTIA (IN-LB-SEC**2)                       5424866.00
     SPRUNG MASS YAW MOMENT OF INERTIA (IN-LB-SEC**2)                         6444883.00
     PAYLOAD WEIGHT (LB)                                                        46800.00
          PAYLOAD DISTANCE AHEAD OF REAR SUSPENSION CENTER(IN)                    183.00
          PAYLOAD CG HEIGHT (IN. ABOVE GROUND)                                     60.00
          PAYLOAD ROLL MOMENT OF INERTIA(IN-LB-SEC**2)                          13000.00
          PAYLOAD PITCH MOMENT OF INERTIA(IN-LB-SEC**2)                       2400000.00
          PAYLOAD YAW MOMENT OF INERTIA(IN-LB-SEC**2)                         2400000.00
```

Figure 2.21


```
TRAILER NO. 1 PARAMETERS
------------------------
     WHEELBASE - DISTANCE FROM KINGPIN TO CENTER OF REAR SUSPENSION (IN)
     BASE VEHICLE KINGPIN STATIC LOAD (LB)                                       383.00
     BASE VEHICLE CURB WEIGHT ON REAR SUSPENSION (LB)                           2815.00
     SPRUNG MASS CG HEIGHT (IN. ABOVE GROUND)                                   8650.00
     SPRUNG MASS ROLL MOMENT OF INERTIA (IN-LB-SEC**2)                            74.80
     SPRUNG MASS PITCH MOMENT OF INERTIA (IN-LB-SEC**2)                        66224.00
     SPRUNG MASS YAW MOMENT OF INERTIA (IN-LB-SEC**2)                        5424866.00
     PAYLOAD WEIGHT (LB)                                                     6444883.00
          PAYLOAD DISTANCE AHEAD OF REAR SUSPENSION CENTER(IN)                46800.00
          PAYLOAD CG HEIGHT (IN. ABOVE GROUND)                                  183.00
          PAYLOAD ROLL MOMENT OF INERTIA(IN-LB-SEC**2)                           60.00
          PAYLOAD PITCH MOMENT OF INERTIA(IN-LB-SEC**2)                       13000.00
          PAYLOAD YAW MOMENT OF INERTIA(IN-LB-SEC**2)                       2400000.00
     LOCATION OF PINTLE HOOK (IN BEHIND REAR SUSP. CENTER)                  2400000.00
     HEIGHT OF PINTLE HOOK (IN ABOVE GROUND)                                    48.00
                                                                                40.00
```

Figure 2.22

TRAILER NO. 2 PARAMETERS

DOLLY KEY: 1 = CONVERTER DOLLY, 2 = FIXED DOLLY	1
DISTANCE FROM TURNTABLE CENTER TO PINTLE HOOK (IN)	60.00
TURNTABLE LOCATION (IN AHEAD OF SUSP. CENTER)	0.0
TURNTABLE HEIGHT ABOVE GROUND (IN)	52.00
WHEELBASE - DISTANCE FROM CENTER OF FRONT SUSP. TO CENTER OF REAR SUSP. (IN)	300.00
BASE VEHICLE CURB WEIGHT ON FRONT SUSPENSION (LB)	8650.00
BASE VEHICLE CURB WEIGHT ON REAR SUSPENSION (LB)	8650.00
SPRUNG MASS CG HEIGHT (IN. ABOVE GROUND)	74.80
SPRUNG MASS ROLL MOMENT OF INERTIA (IN-LB-SEC**2)	66224.00
SPRUNG MASS PITCH MOMENT OF INERTIA (IN-LB-SEC**2)	542486.00
SPRUNG MASS YAW MOMENT OF INERTIA (IN-LB-SEC**2)	644483.00
PAYLOAD WEIGHT (LB)	0.0
*** ZERO ENTRY INDICATES NO PAYLOAD ***	
*** FIVE PAYLOAD DESCRIPTION PARAMETERS ARE NOT ENTERED ***	
LOCATION OF PINTLE HOOK (IN BEHIND REAR SUSP. CENTER)	48.00
HEIGHT OF PINTLE HOOK (IN ABOVE GROUND)	40.00

Figure 2.23

table. If closed-loop steering is desired, the value of ISTEER should be negative. In addition, two parameters to describe the driver transport lag and the end of preview interval (TPP) must be entered following the end of the table data. By setting the value of ISTEER to zero, no further steer table data need be entered and the program will internally generate a straight-line steer table. (See Figures 2.24, 2.25.)

2.5.3 Brake Option. Following the steer tables, a time versus treadle pressure table is entered (Figure 2.26). The option is available to enter a zero for the number of table entries, implying that no braking is to be done, and no further table data or brake description parameters are entered for any axle. The parameters that describe the brakes are:

TQ(I,J,K,L,1) - lag time

TQ(I,J,K,L,2) - rise time

BTQ(I,J,K,L) - brake torque

2.5.4 Road Option. The program allows three options for the user to describe the road upon which the simulation takes place. The option selected is determined by the road key, IROAD. The three conditions are:

IROAD = 0 implies a flat road

IROAD = 1 requires the user to include two additional parameters—one describing the percent grade and one to describe the percent cross-slope of the road

IROAD = -1 indicates that the user will give the road description by using subroutine ROAD. (See Section 2.3.17 and Appendix H of the User's Manual.)

STEER TABLE (NUMBER OF LINES): POSITIVE -STEER ANGLE TABLE, NEGATIVE - PATH FOLLOWER TABLE 3
TABLE ENTRIES:

TIME (SEC)	LEFT WHEEL (DEG)	RIGHT WHEEL (DEG)
0.0	0.0	0.0
0.10	8.00	8.00
8.00	8.00	8.00

Figure 2.24

STEER TABLE (NUMBER OF LINES): POSITIVE -STEER ANGLE TABLE, NEGATIVE - PATH FOLLOWER TABLE -14

CLOSED-LOOP PATH FOLLOWING MODE

X-Y PATH COORDINATES :

X (FEET)	Y (FEET)
0.0	0.0
100.00	-10.10
200.00	-41.70
300.00	-100.00
350.00	-143.00
375.00	-169.00
400.00	-200.00
425.00	-237.00
450.00	-282.00
460.00	-304.00
480.00	-360.00
490.00	-400.00
500.00	-500.00
505.00	-900.00

Figure 2.25

TREADLE PRESSURE TABLE (NUMBER OF LINES) 2
TABLE ENTRIES:

TIME (SEC)	PRESSURE (PSI)
0.0	0.0
1.00	0.0

Figure 2.26

2.5.5 Output Page Selection. As explained in Section 2.4.2, the program collects output variables in a buffer. When the buffer is filled, or when terminating conditions are met, the buffer is then printed. However, the user may not have interest in all of the output generated. Thus, the program allows the user to select categorically those output pages which contain the data of interest. The output selection key IOUT is a seven digit code which is set to suppress the print of the following seven categories of output (1 allows print, 0 suppresses). (See Figure 2.27.)

1) Vehicle positions
2) Vehicle velocities
3) Vehicle accelerations
4) Vehicle tire forces and moments
5) Vehicle brake summary
6) Vehicle lateral tire forces
7) Vehicle suspension summary

2.5.6 Payload. Each unit is capable of carrying a payload. If a payload is used, the following payload description parameters must be entered. (If payload is not used, set PW=0 and no further payload information is entered.)

PW - payload weight (lb)

PX - location of payload c.g. forward rear suspension (in)

PZ - location of paylaod c.g. above ground (in)

PJ(I,1) - payload roll moment of inertia (in-lb/sec^2)

PJ(I,2) - payload pitch moment of inertia (in-lb/sec^2)

PJ(I,3) - payload yaw moment of inertia (in-lb/sec^2)

Figures 2.28 and 2.29 show the use of the payload option.

```
OUTPUT PAGE OPTION KEYS:  0 DELETES PAGES
-----------------------------------------

  SPRUNG MASS     SPRUNG MASS     SPRUNG MASS     TIRE FORCES     BRAKE SUMMARY     LATERAL        UNSPRUNG MASS
  POSITION        VELOCITY        ACCELERATION    PAGES           PAGES             PAGES          PAGES
     1               1               1               1               1                 1              1
```

Figure 2.27

```
TRAILER NO. 3 PARAMETERS
------------------------

     DOLLY KEY: 1 = CONVERTER DOLLY, 2 = FIXED DOLLY                                          2
     DISTANCE FROM TURNTABLE CENTER TO PINTLE HOOK (IN)                                    60.00
     TURNTABLE LOCATION (IN AHEAD OF SUSP. CENTER)                                          0.0
     TURNTABLE HEIGHT ABOVE GROUND (IN)                                                    52.00
     WHEELBASE - DISTANCE FROM CENTER OF FRONT SUSP. TO CENTER OF REAR SUSP. (IN)          300.00
     BASE VEHICLE CURB WEIGHT ON FRONT SUSPENSION (LB)                                  8650.00
     BASE VEHICLE CURB WEIGHT ON REAR SUSPENSION (LB)                                   8650.00
     SPRUNG MASS CG HEIGHT (IN. ABOVE GROUND)                                             74.80
     SPRUNG MASS ROLL MOMENT OF INERTIA (IN-LB-SEC**2)                                 66224.00
     SPRUNG MASS PITCH MOMENT OF INERTIA (IN-LB-SEC**2)                               542486.00
     SPRUNG MASS YAW MOMENT OF INERTIA (IN-LB-SEC**2)                                 644483.00
     PAYLOAD WEIGHT (LB)                                                                   0.0
          *** ZERO ENTRY INDICATES NO PAYLOAD ***
          *** FIVE PAYLOAD DESCRIPTION PARAMETERS ARE NOT ENTERED ***
```

Figure 2.28

```
TRAILER NO. 1 PARAMETERS
------------------------

     WHEELBASE - DISTANCE FROM KINGPIN TO CENTER OF REAR SUSPENSION (IN)                   383.00
     BASE VEHICLE KINGPIN STATIC LOAD (LB)                                              2815.00
     BASE VEHICLE CURB WEIGHT ON REAR SUSPENSION (LB)                                   8650.00
     SPRUNG MASS CG HEIGHT (IN. ABOVE GROUND)                                             74.80
     SPRUNG MASS ROLL MOMENT OF INERTIA (IN-LB-SEC**2)                                 66224.00
     SPRUNG MASS PITCH MOMENT OF INERTIA (IN-LB-SEC**2)                               542486.00
     SPRUNG MASS YAW MOMENT OF INERTIA (IN-LB-SEC**2)                                 644483.00
     PAYLOAD WEIGHT (LB)                                                              46800.00
          PAYLOAD DISTANCE AHEAD OF REAR SUSPENSION CENTER(IN)                          183.00
          PAYLOAD CG HEIGHT (IN. ABOVE GROUND)                                           60.00
          PAYLOAD ROLL MOMENT OF INERTIA(IN-LB-SEC**2)                                13000.00
          PAYLOAD PITCH MOMENT OF INERTIA(IN-LB-SEC**2)                              240000.00
          PAYLOAD YAW MOMENT OF INERTIA(IN-LB-SEC**2)                                240000.00
     LOCATION OF PINTLE HOOK (IN BEHIND REAR SUSP. CENTER)                                48.00
     HEIGHT OF PINTLE HOOK (IN ABOVE GROUND)                                              40.00
```

Figure 2.29

2.5.7 Side-to-Side Options. To further extend the capabilities of simulating actual conditions, side-to-side variation of certain suspension, tire and brake parameters is allowed. This option is available on the following parameters:

K - spring rate

C - viscous damping

CF - coulomb friction

DTS - dual tire separation

CALF - lateral stiffness

CS - longitudinal stiffness

CAT - aligning torque coefficient

CAM - camber coefficient

SRAD - static radius of tire

WHEELI - wheel polar moment of inertia

TQ - brake rise and lag time

BTQ - brake torque

If this option is not used, zero or blank entry of the right-side data will result in the internal assignment of the left-side parameter values to the right side.

2.5.8 Tandem Axle Options. The program allows the user to select tandem axles or single axles for all rear suspensions and for the front suspensions of full-trailers (dolly suspensions). Tandem axle selection is made by setting the appropriate suspension key KEY(I,J) to 1.

If tandem axles are used, three additional parameters must be entered immediately following KEY to describe the tandem axle suspensions.

TAND(I,J) - separation between the leading and trailing axles

FSPLIT(I,J) - percent of static suspension load on leading axle

FSHIFT(I,J) - percent of brake torque reaction acting to transfer load to leading axle.

By varying FSPLIT and FSHIFT, the behavior of various tandem suspensions (walking beam, four spring, long load leveler, etc.) can be simulated. References [3] and [6] provide a more detailed discussion of the use of these parameters. When tandem axles are used, additional tire and brake data need be entered. All tandem axle data should be entered leading axle data followed by trailing axle data (see Figures 2.30 and 3.21).

2.5.9 Nonlinear Spring Option. Each axle simulated has the capacity for nonlinear spring rates. To use this option, K(I,J,K,L) should be given a negative whole number value. If it is the first time nonlinear spring tables are used, or if the table differs from a previous one, immediately following K(I,J,K,L) should be entered NOSPR(I,J,K,L,2), the number of data points (maximum of 10) and the pairs of data points (DEFSPR,FORSPR) that describe the spring rate. Figure 2.32 shows a sample data structure for this option.

2.5.10 Cornering Stiffness (MU-Y) Table Option. Tabular cornering (lateral) force tire data called by a negative CORNERING STIFFNESS value is entered in terms of a normalized lateral traction coefficient, MU-Y, as a function of tire sideslip angle, ALPHA, for at least one, and as many as three, different vertical tire loads and velocities. MU-Y is defined as the nondimensional ratio of tire lateral force to the prevailing vertical load at zero longitudinal slip (free rolling). Two-way linear interpolation is used by the program between entered table points. The format required for entering MU-Y tabular data is as follows (see User's Manual Appendix A for examples):

(Define number of loads and velocities)

Number of vertical loads, NL (3 max.)	(I2 format)
Vertical load values	(3F10.2 format)
Number of velocities, NV (3 max.)	(I2 format)
Velocity values	(3F10.2 format)

(First load/first velocity table)

Number of tire sideslip angles, N11, in first ALPHA versus MU-Y table (max. of 10)	(I2 format)
N11 lines of ALPHA (deg), MU-Y pairs comprising the first table	(2F10.2 format, each line)

TRAILER NO. 2 FRONT SUSPENSION AND AXLE PARAMETERS		LEFT SIDE		RIGHT SIDE
SUSPENSION KEY - 0 INDICATES SINGLE AXLE, 1 INDICATES TANDEM AXLES			0	
SUSPENSION SPRING RATE (LB/IN/SIDE/AXLE)		7818.00		7818.00
SUSPENSION VISCOUS DAMPING (LB-SEC/IN/SIDE/AXLE)		50.00		50.00
COULOMB FRICTION (LB/SIDE/AXLE)		2600.00		2600.00
AXLE ROLL MOMENT OF INERTIA (IN-LB-SEC**2)			4746.00	
ROLL CENTER HEIGHT (IN. ABOVE GROUND)			29.60	
ROLL STEER COEFFICIENT (DEG. STEER/DEG. ROLL)			-0.00	
AUXILIARY ROLL STIFFNESS (IN-LB/DEG/AXLE)			35490.00	
LATERAL DISTANCE BETWEEN SUSPENSION SPRINGS (IN)			38.00	
TRACK WIDTH (IN)			71.25	
UNSPRUNG WEIGHT (LB)			1530.00	

TRAILER NO. 2 FRONT TIRES AND WHEELS	LEFT SIDE	RIGHT SIDE
DUAL TIRE SEPARATION (IN)	12.40	12.40
CORNERING STIFFNESS (LB/DEG/TIRE)	600.00	600.00
LONGITUDINAL STIFFNESS (LB/SLIP/TIRE)	21000.00	21000.00
CAMBER STIFFNESS (LB/DEG/TIRE)	0.0	0.0
ALIGNING MOMENT (IN-LB/DEG/TIRE)	0.0	0.0
TIRE SPRING RATE (LB/IN/TIRE)	4500.00	4500.00
TIRE LOADED RADIUS (IN)	20.20	20.20
POLAR MOMENT OF INERTIA (IN-LB-SEC**2/WHEEL)	212.00	212.00

Figure 2.30

TRAILER NO. 3 FRONT SUSPENSION AND AXLE PARAMETERS

	LEADING TANDEM AXLE		TRAILING TANDEM AXLE	
	LEFT SIDE	RIGHT SIDE	LEFT SIDE	RIGHT SIDE
SUSPENSION KEY - 0 INDICATES SINGLE AXLE, 1 INDICATES TANDEM AXLES	1			
TANDEM AXLE SEPARATION (IN BETWEEN LEADING AND TRAILING AXLES)	48.00			
STATIC LOAD TRANSFER (PERCENT LOAD ON LEAD AXLE)	50.00			
DYNAMIC LOAD TRANSFER (PERCENT OF BRAKE TORQUE TRANSFERRED ONTO LEADING AXLE)	10.00			
SUSPENSION SPRING RATE (LB/IN/SIDE/AXLE)	7818.00	7818.00	7818.00	7818.00
SUSPENSION VISCOUS DAMPING (LB-SEC/IN/SIDE/AXLE)	50.00	50.00	50.00	50.00
COULOMB FRICTION (LB/SIDE/AXLE)	2600.00	2600.00	2600.00	2600.00
AXLE ROLL MOMENT OF INERTIA (IN-LB-SEC**2)	4746.00			4746.00
ROLL CENTER HEIGHT (IN. ABOVE GROUND)	29.60			29.60
ROLL STEER COEFFICIENT (DEG. STEER/DEG. ROLL)	-0.00			-0.00
AUXILIARY ROLL STIFFNESS (IN-LB/DEG/AXLE)	35490.00			35490.00
LATERAL DISTANCE BETWEEN SUSPENSION SPRINGS (IN)	38.00			38.00
TRACK WIDTH (IN)	71.25			71.25
UNSPRUNG WEIGHT (LB)	1530.00			1530.00

TRAILER NO. 3 FRONT TIRES AND WHEELS

	LEADING TANDEM AXLE		TRAILING TANDEM AXLE	
	LEFT SIDE	RIGHT SIDE	LEFT SIDE	RIGHT SIDE
DUAL TIRE SEPARATION (IN)	12.40	12.40	12.40	12.40
CORNERING STIFFNESS (LB/DEG/TIRE)	600.00	600.00	600.00	600.00
LONGITUDINAL STIFFNESS (LB/SLIP/TIRE)	21000.00	21000.00	21000.00	21000.00
CAMBER STIFFNESS (LB/DEG/TIRE)	0.0	0.0	0.0	0.0
ALIGNING MOMENT (IN-LB/DEG/TIRE)	0.0	0.0	0.0	0.0
TIRE SPRING RATE (LB/IN/TIRE)	4500.00	4500.00	4500.00	4500.00
TIRE LOADED RADIUS (IN)	20.20	20.20	20.20	20.20
POLAR MOMENT OF INERTIA (IN-LB-SEC**2/WHEEL)	212.00	212.00	212.00	212.00

Figure 2.31

HSRI

FORTRAN Coding Form

HSRI Form 31

PROGRAM T3DRS:V1 | PROGRAMMER | DATE | EXAMPLE OF NON-LINEAR SPRING OPTION DATA STRUCTURE | PAGE ____ OF ____

STATEMENT NUMBER	CONT	FORTRAN STATEMENT	IDENTIFICATION SEQUENCE
		-1.000 -1.000 ENTRY OF NEGATIVE NO. INDICATES SPRING TABLE *	
04		NO. OF POINTS IN TABLE	
		0.00 0.00 TABLE ENTRIES: DEFLECTION (IN) AND	
		2.00 2000.00 CORRESPONDING FORCE (LB)	
		4.00 6000.00	
		6.00 12000.00	
		15.000 15.000 VISCOUS DAMPING	
		500.000 500.000 COULOMB FRICTION	
		3719.000 AXLE ROLL MOMENT OF INERTIA	
		24.550 ROLL CENTER HEIGHT	
		.	
		.	
		.	
		.	
		.	
		.	
		* NOTE: SINCE -1 IS ENTERED FOR BOTH LEFT AND	
		RIGHT SIDE VALUES, ONLY ONE TABLE NEED	
		BE ENTERED FOR SUBSEQUENT SPRING TABLES,	
		IF THE SAME TABLE IS USED, ONLY THE	
		TABLE NO (-1.) NEED BE ENTERED. HAD THE	
		RIGHT SIDE BEEN ASSIGNED A DIFFERENT	
		TABLE NO, THE TABLE VALUES WOULD BE	
		ENTERED IMMEDIATELY FOLLOWING THE	
		FIRST TABLE.	

Figure 2.32

(First load/second velocity table)

- Number of tire sideslip angles, NI2, in second ALPHA versus MU-Y table (max. of 10) (I2 format
- NI2 lines of ALPHA (deg), MU-Y pairs comprising the second table. (2F10.2 format, each line)

(First load/third velocity table)

- Number of tire sideslip angles, NI3, in third ALPHA versus MU-Y table (max. of 10) (I2 format)
- NI3 lines of ALPHA (deg), MU-Y pairs comprising the third table. (2F10.2 format)

(Repeat for second load condition)

(Repeat for third load condition)

Note: The total number of ALPHA versus MU-Y tables is equal to the product of NV × NL. Hence, a maximum of nine (9) such tables are permitted (NV = NL = 3) and a minimum of one (1) table (NV = NL = 1) is required.

Immediately following the ALPHA versus MU-Y tables, a "roll-off" tabular function which allows for reduction of the free-rolling tire lateral forces under longitudinal (braking) slip conditions is required. In the event no braking occurs, a simple one-point table may be used. The "roll-off" table is a two-way table of the parameter, ROLLY, as a function of longitudinal slip (SLIP) and sideslip (ALPHA) of the tire. ROLLY is simply a multiplication factor for MU-Y defined at the selected SLIP and ALPHA values in the table and interpolated elsewhere. ROLLY values of 1.0 simply return the free-rolling MU-Y value. Likewise, a ROLLY value of 0.75 would diminish the value of MU-Y by 25 percent at the specified longitudinal/sideslip point in the "roll-off" table.

The following format is used for entering lateral "roll-off" function tabular data:

(Define arguments of the table)

- Number of longitudinal slip (SLIP) points, NS, in the "roll-off" table (10 max.) (I2 format)
- NS lines of longitudinal slip (SLIP) values (F10.2 format, each line)
- Number of sideslip (ALPHA) points, NSS, in the "roll-off" table (10 max.) (I2 format)

NSS lines of sideslip (ALPHA) values (F10.2 format, each line)

NSS × NS matrix of ROLLY values defining the "roll-off" tabular function. NSS lines containing NS ROLLY values/line as shown below. (10F8.2 format)

	$Slip_1$	$Slip_2$	etc.
$Alpha_1$	$ROLLY_{11}$	$ROLLY_{12}$	.....
$Alpha_2$	$ROLLY_{21}$	$ROLLY_{22}$	.....
etc.	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	
	.	.	

ROLLY TABLE

Note: The maximum size of the ROLLY table is 10 × 10 (NSS = NS = 10). Minimum size is 1 × 1 (NSS = NS = 1).

2.5.11 Longitudinal Stiffness (MU-X) Tables. Tabular braking (longitudinal) force tire data is entered in exactly the same format as used for cornering data. This data must follow immediately after the negative LONGITUDINAL STIFFNESS entry. MU-X, a normalized longitudinal traction coefficient, now replaces MU-Y as the dependent table variable and longitudinal slip, SLIP, replaces ALPHA as the independent table variable. MU-X is defined as the nondimensional ratio of longitudinal tire force to the prevailing vertical load at a zero tire sideslip angle. Like the lateral force table data, up to three vertical loads and speeds may be specified.

A longitudinal "roll-off" function is likewise required in the case of MU-X tabular data. ROLLX, a multiplicative factor analogous to ROLLY for cornering data, is specified in a two-way table of longitudinal slip (SLIP) versus sideslip (ALPHA) identical to that format used for the lateral "roll-off" table.

Sources of lateral and longitudinal tire force data for heavy trucks that are largely compatible with the T3DRS:V1 program, are contained in References [2, 7, 8, 9, 10, 11].

2.5.12 Brake Torque Option. For simulating a braking maneuver, the user has the choice of a constant brake torque value per psi of treadle pressure or a pressure versus torque table. To use the pressure versus torque table option, the value of BTQ(I,J,K,L) should be a negative whole number. If it is the first time that pressure torque tables are referenced, or if the table differs from previously defined tables, immediately following BTQ(I,J,K,L) should be entered NUM(I,J,K,L,2), the number of data points of the table (maximum of 10) and the pairs of pressure (psi) versus torque (in-lb/psi).

2.5.13 Antilock Option. If the user wishes to simulate a braking maneuver with an antilock system, following the last vehicle is a key which, when set to 01, will call for antilock input data to be read. The antilock routine allows for a number of modes to be simulated in varying degrees of complexity and sophistication. A detailed explanation of this option can be found in Appendix D of the User's Manual.

3.0 OPERATING ENVIRONMENT

3.1 MTS

The simulation program was developed on The University of Michigan computer, an Amdahl 470V/7, whose overall system control is known as the Michigan Terminal System (MTS).

The Amdahl 470V/7 is compatible with the IBM System/370 series of computers. The major hardware components include the central processor, 16 I/O channels and 6 million bytes of main storage. Support hardware includes two IBM 2305 Model 2 fixed head file units, each with a capacity of about 2301 pages of 4096 bytes and a disk storage system with a total capacity of about 4.8 billion bytes. Both 9- and 7-track tape drive mounts are available (800-6250 BPI) with capability of using both EBCDIC and ASCII code. Plotting facilities include software and interfacing with Tektronics graphic terminals and a Calcomp Model 936 drum plotter.

Conversation usage of MTS is accommodated by over 300 terminal lines capable of interfacing with a multitude of commercially available terminals and CRT units.

The MTS control system was developed at The University of Michigan for both batch and interactive processing utilizing virtual memory and multilash techniques. Extensive file-editing facilities are available as are state-of-the-art symbolic debugging capabilities for FORTRAN IV, assembly language and PL/I.

3.2 Computer Requirements for T3DRS:V1

3.2.1 Hardware Requirements. The program is a digital computer-based simulation model requiring a digital computer with at least one input and one output device. If the output device is a line printer, the line needs to be capable of printing 132 characters. The program is written for batch mode operations. It will accept input from any device assigned to five (tape drive, disk file, card reader, etc.). It is conceivable that a user could input variables interactively, although conversational prompting does not occur.

3.2.2 Software and Core Requirements. The core requirements for loading the program on MTS are approximately 620,000 bytes. In addition, the program requires (from the resident system library) a number of common trigonometric functions (SIN, COS, TAN, etc.) as well as five subroutines from the IBM Scientific Subroutine Package (Sections 2.3.1, 2.3.17 and Appendix B list all library functions required for each subroutine).

The T3DRS:V1 program is written in FORTRAN IV Level G, and has been compiled on MTS both with a Level G and Level H compiler.

4.0 MAINTENANCE PROCEDURE

4.1 Programming Conventions

4.1.1 Common Blocks. Throughout the program, the most important variables, both input and computed, are passed from one subroutine to another by common blocks. This was done to minimize errors in addressing and allocation as sometimes occurs when numerous arguments are passed in call statements. Appendix D lists these variables by block and contains a description of each one's function. A complete cross-reference index of variables may be found at the end of each subroutine source list in Appendix B.

4.1.2 Subscripts. One of the major objectives of this program is to accommodate a number of general configurations of vehicles. As such, many of the calculations for a multi-unit vehicle can be achieved by reiteration of the same calculation for each unit. Thus, numerous important variables are multi-subscripted to allow for the most general configuration. The subscripting holds to the following convention:

Variable (IVEH,JSUS,KAX,LSIDE,NO1,NO2,...NO.N)

where

Variable is the variable name

IVEH is the unit No. $1 \leq$ IVEH $\leq$ no. of units

JSUS is the suspension (1 = front, 2 = rear)

KAX is the axle number on the suspension (1 = leading tandem or single, 2 = trailing tandem)

LSIDE is the side of the axle (1 = left side, 2 = right side)

No.1...No.N are numbers relative to the variable requirements.

In general, subscripted variables will be of the following form:

1) Variable (IVEH) — Example: Input parameters pertaining to vehicle; VW(IVEH), PW(IVEH), WHBS(IVEH)

2)	Variable (IVEH,JSUS)	Example: Axle parameters KEY(IVEH,JSUS), FSPLIT(IVEH,JSUS)
3)	Variable (IVEH,JSUS,KAX)	Example: Suspension parameters PSW(IVEH,JSUS,KAX)
4)	Variable (IVEH,BUS,KAX, LSIDE)	Example: Tire parameters KT(IVEH,JSUS,KAX,LSIDE), or tire forces FXW(IVEH,BUS,KAX,LSIDE)
5)	Variable (IVEH,JSUS,KAX, LSIDE,IJ)	Example: Brake parameters TQ(I,J,K,L,IJ) or table indices

As much as possible, the variables IVEH, JSUS, KAX, LSIDE are used as indices for do-loop iterations.

4.2 Program Error Messages

There are two types of error messages that the program can produce:

1) User input error messages

2) Error return from HPCG

4.2.1 Input Errors. There are two error messages that may occur during the input operation. If either error message is printed, the program will terminate at that point. The first possible input error message is:

*****TAUMEM PROBABLY TOO LARGE*****

This may occur during a closed-loop path-follower simulation. It is caused by the value of TAUMEM being too large to allow the path-follower to converge on the specified trajectory. User should consult the User's Manual for more detail about the closed-loop steer mode.

The second input error message which may occur is:

*****ERROR RETURN*****
*****ATTEMPT TO ASSIGN PREVIOUS TABLE TYPE XX TO A TYPE XX TABLE*****

This message occurs when using table look-up options (see Sections 2.5.9-2.5.12 and the User's Manual). Each table type must be assigned a unique number.

The user should note that if these messages do not occur, the program will simulate the vehicle that is described by the input parameters. However, this does not mean that all input parameters are necessarily correct. The user should carefully check the input echo to verify that the maneuver and vehicle described comprise the desired simulation.

4.2.2 HPCG Error Rerun Codes. Once the simulation has begun, there are two types of interrupts that one might experience:

1) System Interrupts - Usually indicate that input data is incorrect—i.e., the maneuver or vehicle described cannot be simulated. The usual cause for this is too large values for moments of inertia, too large brake torques, incorrect tire data, etc.

2) HPCG Interrupt - If this occurs, the error message "IHLF = N" will be printed and execution terminated. If IHLF = 12, the final maximum real time for simulation was initialized to zero. If IHLF = 13, the final maximum real time for simulation was initialized to a negative number. If IHLF = 11, it indicates that the integration could not meet the set tolerances. This usually occurs at the end of a limit maneuver, or when wheel lift-off occurs.

Although every effort has been made to minimize the possibility of error, should the user incur repeated interrupts or errors, please contact the Highway Safety Research Institute, Physical Factors Division for assistance.

APPENDICES

APPENDIX A

VARIABLE DICTIONARY

This appendix consists of an alphabetical list of all common blocks, subroutines in which each one is referenced, and a brief description of type and function of each variable in the argument list. A more comprehensive cross-index of variables may be found in Appendix B following each subroutine source list, and more detailed descriptions of the input variables may be found in Section 2.4.1 and in the User's Manual [6].

COMMON BLOCKS:

I. COMMON/ANTLK/IALOPT (32), IOP (32), ILOCK

Referenced In: ANTLKR, INPUT, BRAKE1

Variable	Type	Description
IALOPT	Integer - Input in ANTLKR	Independent wheel system keys
IOP	Integer - Set in ANTLKR	Indicator key - systems ON/OFF
ILOCK	Integer - Input in INPUT	GLOBAL key

II. COMMON/BOUT/P (4,2,2,2), PO (4,2,2,2), TCST (4,2,2,2), T (4,2,2,2), PTRD

Referenced In: FCT1, OUTPUT, TANDEM, BRAKE1, LINE

Variable	Type	Description
P(I,J,K,L)	Real - Set in BRAKE1	Brake line pressure for tire (I,J,K,L)
PO(I,J,K,L)	Real - Set in BRAKE1	Previous brake line pressure at time X - ΔX
TLST(I,J,K,L)	Real - Set in BRAKE1	Previous brake torque at time X - ΔX
T(I,J,K,L)	Real - Set in BRAKE1	Brake torque at tire (I,J,K,L)
PTRD	Real - Set in BRAKE1	Treadle pressure at time X

III. COMMON/BRAKE/BTQ (4,2,2,2), TQ (4,2,2,2,2), NUM (4,2,2,2,2), XX (4,320), YY (4,320), NTP (1,2), XTP (10), YTP (10), IBK

Referenced In: FCT1, OUTPUT, INPUT, BRAKE1, TABIN

Variable	Type	Description
BTQ(4,2,2,2)	Real - Input variable	Brake torque per wheel. If tables are to be used, value is negative (in-lb/psi)
TQ(4,2,2,2,2)	Real - Input variable	TQ(I,J,K,L,1) = Rise Time TQ(I,J,K,L,2) = Lag Time (sec)
NUM(4,2,2,2,2)	Integer - Input variable	For brake tables only - pointers for data array
XX(4,320)	Real	Brake table data array for pressure (psi)
YY(4,320)	Real	Brake table data array for torque (in-lb/psi)
NTP(1,2)	Integer	Pointers for time vs. treadle pressure table. If 0 no brake data need be entered
XTP(10)	Real - Input variable	X-array for time vs. pressure table - time in sec.
YTP(10)	Real - Input variable	Y-array for time vs. pressure table - pressure in psi
IBK	Integer - Initialized in input	Brake key - 1 indicates no brakes. 0 indicates brakes used

IV. COMMON/CGLOC/A1 (4,2,2), BX (4,2,2), ZZJ (4)

Referenced In: FCT1, OUTPUT, INPUT, TANDEM

Variable	Type	Description
A1(I,J,K)	Real - Computed in input	Location of sprung mass c.g. to the K^{th} axle of the J^{th} suspension on the I^{th} vehicle (ft)
BX(I,J,K)	Real - Computed in input	Location of the total mass c.g. to the K^{th} axle of the J^{th} suspension on the I^{th} vehicle (ft)
ZZJ(I)	Real - Computed in input	Total yaw moment of inertia (ft-lb-sec**2)

V. COMMON/CMACC/XDDCM (4), YDDCM (4), PSIDD (4), DBX (4), DBY (4)

Referenced In: FCT1, OUTPUT, BRAKE1, TIRINI

Variable	Type	Description
XDDCM(I)	Real - Set in OUTPUT	Mass center longitudinal acceleration used for constraint estimates
YDDCM(I)	Real - Set in OUTPUT	Mass center lateral acceleration used for constraint estimates
PSIDD(I)	Real - Set in OUTPUT	Mass center pitch acceleration used for constraint estimates
DBX(I)	Real - Set in OUTPUT	Dolly longitudinal acceleration in body axis systems
DBY(I)	Real - Set in OUTPUT	Dolly lateral acceleration in dolly axis system

VI. COMMON/DRIVE/ISTEER

Referenced In: OUTPUT, INPUT

Variable	Type	Description
ISTEER	Integer - Input variable	Closed-loop steer key

VII. COMMON/DUAL/DUALTQ (4,2,2,2)

Referenced In: FCT1, TIRINI

Variable	Type	Description
DUAL(4,2,2,2)	Real - Computed in TIRINI	Dual tire contribution to axle forces and moments

VIII. COMMON/FCTOUT/XBAR (4,3), PHIBAR (4,3), UBAR (4,3), PBAR (4,3)

Referenced In: FCT1, OUTPUT, DRIVE1, BRAKE1, TIRINI

Variable	Type	Description
XBAR(I,3)	Real - Set in FCT1	Inertial locations of sprung mass c.g.: XBAR(I,1)=X, XBAR(I,2)=Y, XBAR(I,3)=Z
PHIBAR(I,3)	Real - Set in FCT1	Sprung mass Euler angles. PHIBAR(I,1)=PHI, PHIBAR(I,2)=THETA, PHIBAR(I,3)=PSI

Variable	Type	Description
UBAR(I,3)	Real - Set in FCT1	Sprung mass velocities in body coordinates UBAR(I,1)=U, UBAR(I,2)=V, UBAR(I,3)=W
PBAR(I,3)	Real - Set in FCT1	Sprung mass rotation rates about body X,Y,Z PBAR(I,1)=P, PBAR(I,2)=0, PBAR(I,3)=R

IX. COMMON/INOUT/TINC, IOUT (7)

Referenced In: OUTPUT, INPUT

Variable	Type	Description
TINC	Real - Input variable	Time increment of output buffer (sec)
IOUT(7)	Integer - Input variables	Output page option key

X. COMMON/KEY/MVEH, KEY (4,2), KDOLLY (4)

Referenced In: FCT1, OUTPUT, TABLE, DRIVE1, INPUT, TANDEM, BRAKE1, TIRE1, TIRINI, LINE

Variable	Type	Description
MVEH	Integer - Initialized	Value is total number of vehicle units (NVEH + 1)
KEY(I,J)	Integer - Input variable	Description of the J^{th} suspension on the I^{th} vehicle. 0 = single axle, 1 = tandem KEY(1,1) = 0 by default KEY(2,1) Undefined by definition
KDOLLY(I)	Integer - Input variable	Description of the dolly on the I^{th} vehicle. 2 = fixed, 1 = converter KDOLLY(1),(2) Undefined by definition

XI. COMMON/PAGE/NP, HEAD(20), R, W

Referenced In: MAIN, OUTPUT, ANTLKR, PRINT, DRIVE1, INPUT, TANDEM BRAKE1, TIRINI, TABIN, TRAJ

Variable	Type	Description
NP	Integer - Initialized in input	Page counter for headings
HEAD	20A4 - Input variable	Title header

Variable	Type	Description
R	Integer - Initialized in MAIN	Input device number
W	Integer - Initialized in MAIN	Output device number

XII. COMMON/PIN/FPINX (4), FPINY (4), FPIN (3), XMOM, DELPIN, PSIDOL (4), TFORAX (4), TFORBX (4), TFORAY (4), TFORBY (4), TFORAZ, TFORBZ

Referenced In: FCT1, OUTPUT, TIRINI

Variable	Type	Description
FPINX(4)	Real - Computed in FCT	Pin forces in X direction
FPINY(4)	Real - Computed in FCT	Pin forces in Y direction
FPIN(3)	Real - Computed in FCT	Pin forces on tractor (1=X, 2=Y, 3=Z direction)
XMOM	Real - Computed in FCT	Cross moment at fifth wheel
DELPIN	Real - Computed in FCT	Deflection of kingpin
PSIDOL(4)	Real - Computed in FCT	Steer angle of dolly
TFORAX(4)	Real - Computed in FCT	Tongue forces on lead trailer - X direction
TFORBX(4)	Real - Computed in FCT	Tongue forces on trailing trailer - X direction
TFORAY(4)	Real - Computed in FCT	Tongue forces, Y direction, on leading trailer
TFORBY(4)	Real - Computed in FCT	Tongue forces, Y direction, on trailing trailer
TFORAZ	Real - Computed in FCT	Vertical force on pintle hook
TFORBZ	Real - Computed in FCT	Vertical force on turntable

XIII. COMMON/ROADD/DZDXO, DZDYO, IROAD, XFRONT(4), XBACK(4)

Referenced In: MAIN, INPUT, OUTPUT, FCT1, TIRINI

Variable	Type	Description
DZDXO	Real*	Percent grade of road
DZDYO	Real*	Percent cross-slope of road
IROAD	Integer	Road key
XFRONT(4)	Real - Computed in FCT1	C.G. location with respect to articulation connections
XBACK(4)	Real - Computed in FCT1	C.G. location with respect to articulation connections

*Input Variable

XIV. COMMON/SLOPES/SLOPEY (4,2,2,2)

Referenced In: DRIVE1, TIRE1, TIRINI

Variable	Type	Description
SLOPEY(I,J,K,L)	Real - Set in TIRINI	$dmu/d\alpha$

XV. COMMON/SPMASS/WHBS(4), BB1(4), A3(4), APHI(4), DELTA(4), VW(4), VJ(4,3), PW(4), PX(4), PZ(4), PJ(4,3), SNL(4,2), D(4), PH(4), TOL(4), MC5

Referenced In: FCT1, DRIVE1, INPUT, TANDEM, OUTPUT, TIRINI

Variable	Type	Description
*WHBS(I)	Real	Wheelbase (in.)
*BB1(I)	Real	Kingpin/turntable offset (in.)
*A3(I)	Real	Pintle hook location (in.)
*APHI(I)	Real	Distance from pintle hook to trailer front suspension (in.)
*DELTA(I)	Real	Sprung mass c.g. height above ground (in.)
VW(I)	Real - Calculated in input	Sprung weight (lb)
*VJ(I,3)	Real	Moments of inertia of sprung mass: (I,1)=roll (in-lb/sec**2) (I,2)=pitch (in-lb/sec**2) (I,3)=yaw (in-lb/sec**2)

Variable	Type	Description
*PW(I)	Real	Payload weight (lb)
*PX(I)	Real	Payload c.g. location, forward of suspension centerline (in.)
*PZ(I)	Real	Payload c.g. height above ground (in.)
*PJ(I,3)	Real	Payload moments of inertia (in-lb/sec**2) (I,1) = roll (I,2) = pitch (I,3) = yaw
*SNL(I,2)	Real	Base weights of each vehicle suspension, (2,1) = static kingpin weight (lb)
*D(I)	Real	Height of fifth wheel/turntable above ground (in.)
*DH(I)	Real	Height of pintle hook above ground (in.)
TOL(1)	Real - Initialized in input	Unstretched tongue length (in.)
*MC5	Real	Fifth wheel cross moment (in-lb/deg)

(See Figures A-1, A-2)

*Denotes input variable

XVI. COMMON/SPRING/S (4,2,2,2), SD (4,2,2,2), THETAX (4,2,2) DTHAX (4,2,2,2), ZAXLE (4,2,2), DZAXLE (4,2,2), DV (4,2,2,2), NOSPR (4,2,2,2,2), DEFSPR (320), FORSPR (320), ZO (4,2,2,2), XLOAD (4,2,2,2)

Referenced In: FCT1, LINE, OUTPUT, INPUT, TANDEM, TABIN, TIRINI

Variable	Type	Description
S(I,J,K,L)	Real - Set in TANDEM	Vertical displacement of axle relative to sprung mass
SD(I,J,K,L)	Real - Set in TANDEM	Rate of change in vertical displacement relative to sprung mass
THETAX(I,J,K,L)	Real - Set in FCT1	Roll angle of axle
DTHAX(I,J,K,L)	Real - Set in FCT1	D/DT (THETAX)
ZAXLE(I,J,K)	Real	Vertical position of axle
DZAXLE(I,J,K)	Real - Set in FCT1	D/DT (ZAXLE)

Denotes sprung mass c.g.

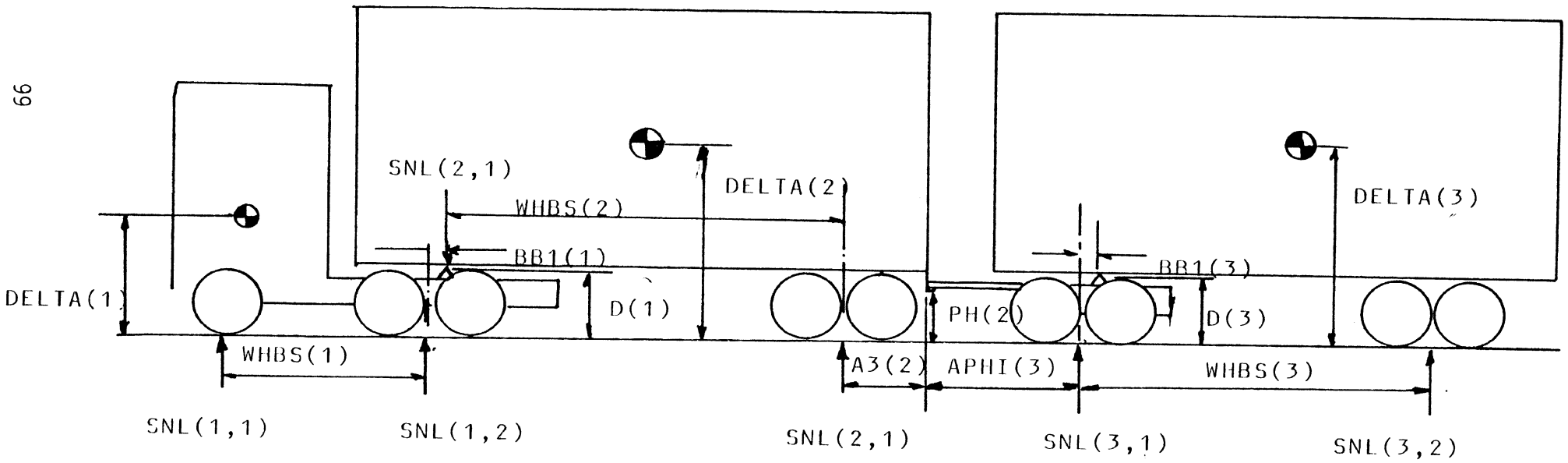

Figure A.1 - Base Vehicle Input Parameters

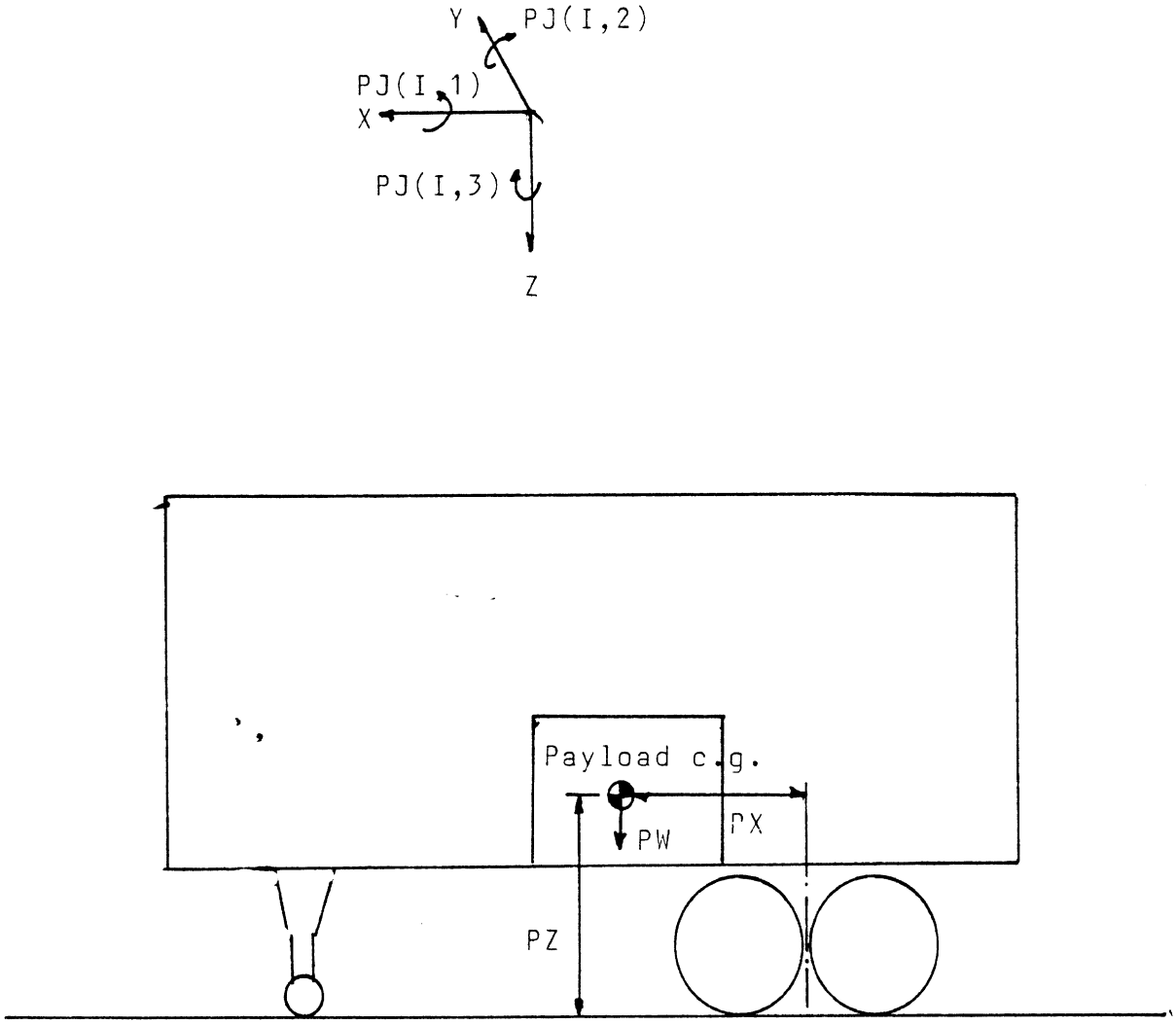

Figure A.2 - Payload Description Parameters

Variable	Type	Description
DV(4,2,2,2)	Real - Set in FCT1	Coulomb friction "break point"
NOSPR(4,2,2,2,2)	Integer - Input variable	Used for spring tables - array pointers
DEFSPR(320)	Real - Input variable	Deflection values of spring tables
FORSPR(320)	Real - Input variable	Force values of spring tables
ZO(I,J,K,L)	Real - Set in INPUT	Initial spring displacement (non-linear springs only)
XLOAD(I,J,K,L)	Real - Set in INPUT	Initial spring load

XVII. COMMON/STATIC/NS (4,2,2), FT(4), SF (4,2,2,2)

Referenced In: FCT1, OUTPUT, DRIVE1, INPUT, TANDEM, TIRINI

Variable	Type	Description
NS(I,J,K)	Real - Computed in input	Normal static load on the K^{th} axle of the J^{th} suspension on the I^{th} vehicle (lb)
FT(4)	Real - Computed in input	Force of the tongue of the I^{th} vehicle (lb)
SF(I,J,K,L)	Real - Computed in line	Suspension force of the L^{th} side, K^{th} axle, J^{th} suspension, I^{th} vehicle (lb)

XVIII. COMMON/TAND/FSPLIT (4,2), FSHIFT (4,2), TD (4,2)

Referenced In: FCT1, OUTPUT, INPUT, TANDEM, LINE

Variable	Type	Description
FSPLIT(I,J)	Real - Input variable	Value is percent of total suspension static normal load on leading axle of the J^{th} suspension, I^{th} vehicle. FSPLIT(1,1) = 100, FSPLIT(2,1) is undefined by default. If there are no tandems, FSPLIT(I,1) = 100, FSPLIT(I,2) is undefined.
FSHIFT(I,J)	Real - Input variable	Value is percent load transferred onto leading tandem of the J^{th} suspension, I^{th} vehicle during brakin
TD(I,J)	Real - Input variable	Separation of leading and trailing axles, J^{th} suspension, I^{th} vehicle

(See Figure A-3)

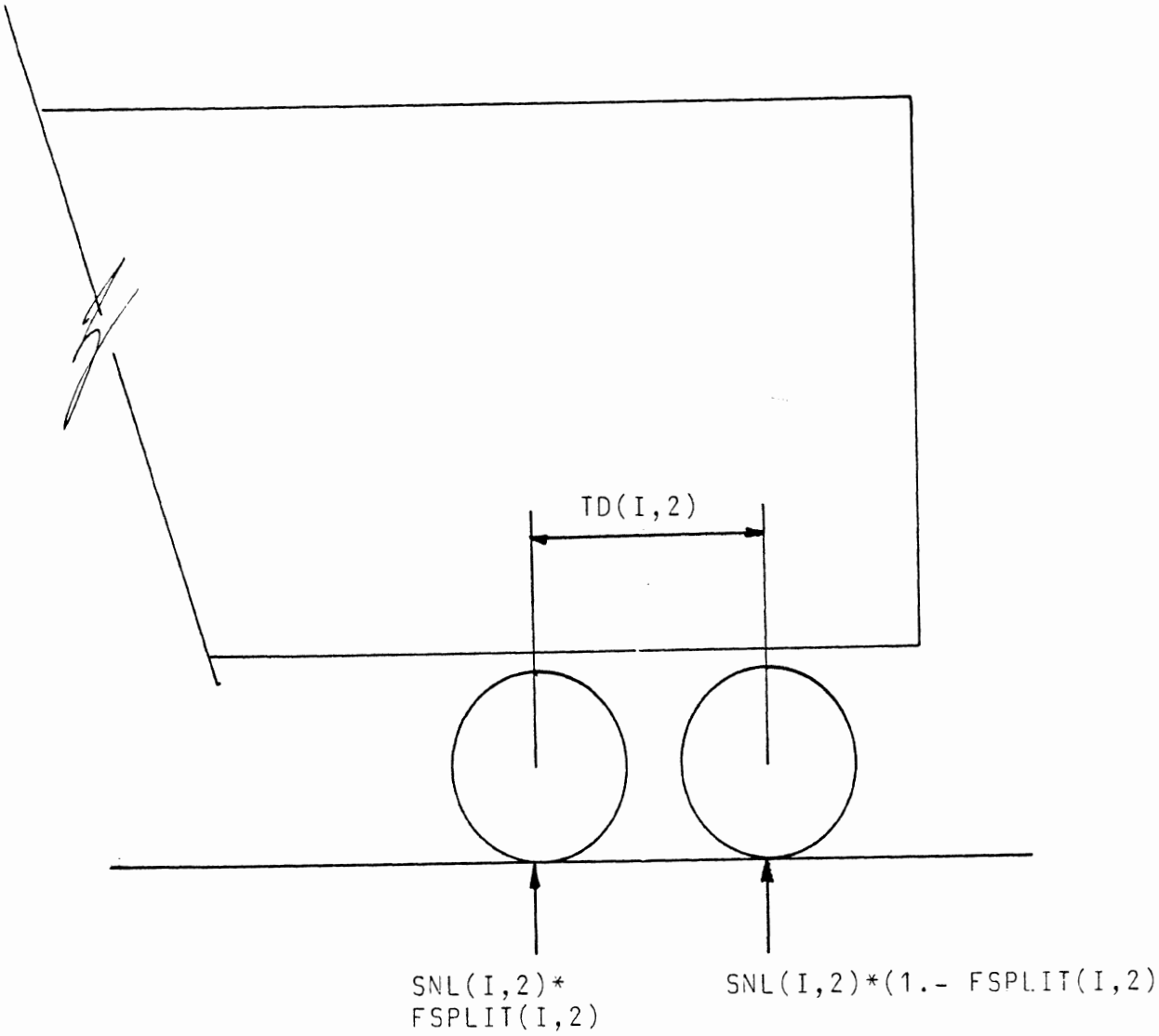

Figure A.3 - Tandem Axle Description

XIX. COMMON/TIRES/SRAD (4,2,2,2), CALF (4,2,2,2) DTS (4,2,2,2), KT (4,2,2,2), CS (4,2,2,2), N (4,2,2,2), CAT (4,2,2,2), YT (4,2,2,2), YTD (4,2,2,2), TSUM (4,3), XAXFOR (4,2,2), YAXFOR (4,2,2), FYI (4,2,2,2), FXI (4,2,2,2), FXW (4,2,2,2), FYW (4,2,2,2), ALFPRM (4,2,2,2), SLIP (4,2,2,2)

Referenced In: FCT1, OUTPUT, DRIVE1, INPUT, TANDEM, BRAKE1, TIRE1, TIRINI

Variable	Type	Description
*SRAD(I,J,K,L)	Real	Static radius of the tire on the L^{th} side, K^{th} axle, J^{th} suspension, I^{th} vehicle
*CALF(I,J,K,L)	Real	Lateral force of the tire on the L^{th} side, K^{th} axle, J^{th} suspension, I^{th} vehicle. If CALF(I,J,K,L) is negative, Mu-Y ALPHA tables are used
*DTS(I,J,K,L)	Real	Dual tire separation of tire (I,J,K,L. DTS(1,1,1,1), (1,1,1,2) Default=0
*KT(I,J,K,L)	Real	Tire spring rate of tire (I,J,K,L)
*CS(I,J,K,L)	Real	Longitudinal force of tire (I,J,K,L). If negative, Mu-X V slip tables are used
N(I,J,K,L)	Real - Computed in TIRE1	Normal load on tire (I,J,K,L) (lb)
*CAT(I,J,K,L)	Real	Coefficient of aligning torque (ft-lb-deg)
YT(I,J,K,L)	Real - Computed in FCT1	Vertical position of tire (I,J,K,L)
YTD(I,J,K,L)	Real - Computed in FCT1	Vertical velocity of tire (I,J,K,L)
TSUM(I,3)	Real - Computed in FCT1, TANDEM	Sum of moments about axle 1=X, 2=Y, 3=Z
XAXFOR(I,J,K)	Real - Computed in FCT1	Axle constraint force in body X direction
YAXFOR(I,J,K)	Real - Computed in FCT1	Axle constraint force in body Y direction
FYI(I,J,K,L)	Real - Computed in FCT1	Tire forces in Y direction in inertial coordinate system
FXI(I,J,K,L)	Real - Computed in FCT1	Tire forces in X direction in inertial coordinate system
FXW(I,J,K,L)	Real - Computed in TIRE1	Tire forces in X direction in wheel plane
FYW(I,J,K,L)	Real - Computed in TIRE1	Tire forces in Y direction in wheel plane

Variable	Type	Description
ALFPRM(I,J,K,L)	Real - Computed in TIRE1	Tire sideslip angle
SLIP(I,J,K,L)	Real - Computed in TIRE1	Longitudinal slip

*Input variable

XX. COMMON/TIRTAB/UXY (4,3,2,2,10,6,3), V1BRK (4,3,2,2,6,3,10), VBRK (4,3,2,2,6), FZBRK (4,3,2,2,6), XiROLX (10,4,3,2,2), X1ROLY (10,4,3,2,2), X2ROLX (10,4,3,2,2), X2ROLY (10,4,3,2,2), XYROLX (10,10,4,3,2,2), XYROLY (10,10,4,3,2,2), NMAXV1 (4,3,2,2,6,3), NTABXY (4,3,2,2,2,2), N1ROLX (4,3,2,2), N1ROLY (4,3,2,2), N2ROLX (4,3,3,3), N2ROLY (4,3,2,2)

Referenced In: TABIN, TIRE1, TIRINI

Variable	Type	Description
VXY(4,3,2,2,10, 6,3)	Real*	
V1BRK(4,3,2,2, 6,3,10)	Real*	
VBRK(4,3,2,2,6)	Real*	
FZBRK(4,3,2,2,6)	Real*	
X1ROLX(10,4,3, 2,2)	Real*	Arrays for tire table data
X1ROLY(10,4,3, 2,2)	Real*	
X2ROLX(10,4,3, 2,2)	Real*	
X2ROLY(10,4,3, 2,2)	Real*	
XYROLX(10,10,4, 3,2,2)	Real*	
XYROLY(10,10,4, 3,2,2)	Real*	
NMAXV1(4,3,2,2, 6,3)	Integer*	
NTABXY(4,3,2,2, 2,2)	Integer*	Indices for tire tables
N1ROLX(4,3,2,2)	Integer*	
N1ROLY(4,3,2,2)	Integer*	
N2ROLX(4,3,2,2)	Integer*	
N2ROLY(4,3,2,2)	Integer*	

*Input variables - see Sections 2.5.11, 2.5.12

XXI. COMMON/TOUT/TALIGN (4,2,2,2)

Referenced In: FCT1, OUTPUT

Variable	Type	Description
TALIGN(4,2,2,2)	Real - Computed in TIRINI	Aligning moment of each tire

XXII. COMMON/TRANS/CPSI (4), SPSI (4), A (4,3,3), BZ (4,3,3)

Referenced In: FCT1, OUTPUT

Variable	Type	Description
CPSI(I)	Real - Set in OUTPUT	COS (PSI(I))
SPSI(I)	Real - Set in OUTPUT	SIN (PSI(I))
A(I,3,3)	Real - Set in OUTPUT	Transformation matrix - sprung mass to inertial coordinates
BZ(I,3,3)	Real - Set in OUTPUT	Transformation matrix - unsprung mass to sprung mass coordinates

XXIII. COMMON/TURN/NOTURN (2,2), TURNX (50), TURNY (50), DELT (4,2,2,2)

Referenced In: FCT1, OUTPUT, INPUT, TANDEM, TIRINI

Variable	Type	Description
NOTURN(2,2)	Integer - Input variable	Array pointers for steer table
TURNX(50)	Real - Input variable	Time array for steer table (sec)
TURNY(50)	Real - Input variable	Tractor front wheels steer array for steer table (deg). TURNY(1-25) = left wheel, TURNY(26-50) = right wheel.
DELT(4,2,2,2)	Real	Steer angles of each wheel (rad)

XXIV. COMMON/UNSPM/K (4,2,2,2), C (4,2,2,2), JA (4,2,2), RCI (4,2,2), SYI (4,2,2), TRA (4,2,2), ASW (4,2,2), ASM (4,2,2), AXDELT (4,2,2), RST (4,2,2), KRS (4,2,2), AUXROL (4,2,2), CF (4,2,2,2)

Referenced In: FCT1, OUTPUT, INPUT, TANDEM, TIRINI

Variable	Type	Description
*K(I,J,K,L)	Real	Suspension spring rate for L^{th} side, K^{th} axle, J^{th} suspension, I^{th} vehicle. If < 0, table is used (lb/in)
*C(I,J,K,L)	Real	Viscous damping per side of axle (lb)
*JA(I,J,K)	Real	Polar moment of inertia of axle (in-lb-sec**2)
*RCI(I,J,K)	Real	Roll center height of axle (in)
*SYI(I,J,K)	Real	Spring separation (in)
*TRA(I,J,K)	Real	Track width (in)
*ASW(I,J,K)	Real	Unsprung weight (lb)
ASM(I,J,K)	Real - Computed in TANDEM	Unsprung mass (slugs)
AXDELT(I,J,K)	Real - Computed in INPUT	Sprung mass c.g. height above axle (ft)
*RST(I,J,K)	Real	Roll steer coefficient (deg/deg)
*KRS(I,J,K)	Real	Auxiliary roll stiffness (lb/deg)
AUXROL(I,J,K)	Real - Computed in FCT1	Auxiliary roll moment (ft-lb)
*CF(4,2,2,2)	Real	Coulomb friction (lb)

(See Figure A-4)

*Input variable

XXV. COMMON/WSPD/UW (4,2,2,2)

Referenced In: OUTPUT, TIRINI, BRAKE1

Variable	Type	Description
UW(I,J,K,L)	Real - Set in TIRINI	Wheel speed

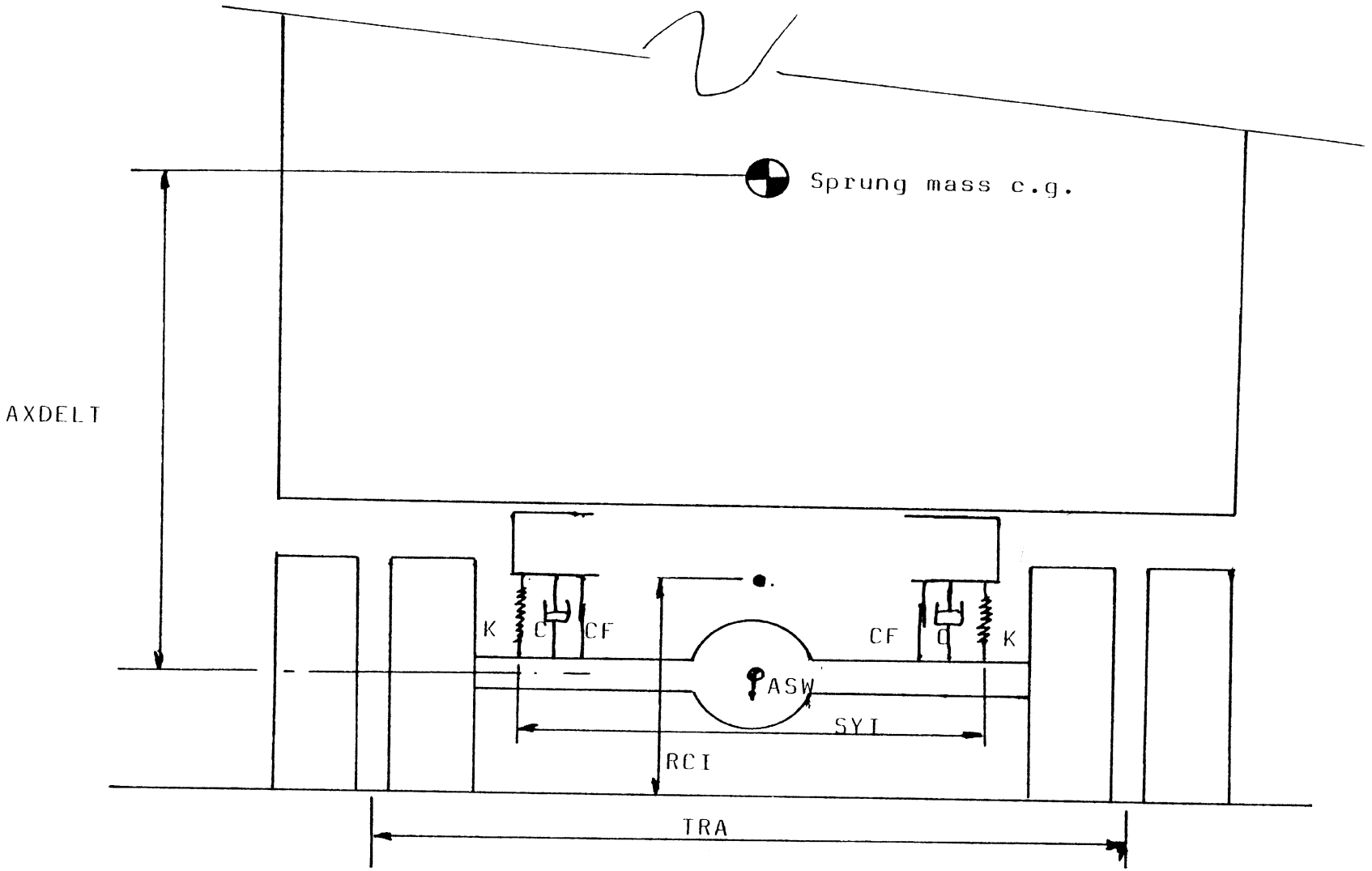

Figure A.4 Unsprung Mass Parameters

XXVI. COMMON/WHEEL/WHEELI (4,2,2,2)

Referenced In: INPUT, TIRINI, TIRE1

Variable	Type	Description
WHEELI(I,J,K,L)	Real - Input variable	Wheel inertia

APPENDIX B

SOURCE LIST

OVERRIDING PAR=C=IBM

FINTIDY OPTIONS: SOURCE FORMAT=IBM NOBCD ISN XREF NOLBLXREF LINECNT=60 ERRMAX=25

SCARDS=SJLZ:HUL.FUWA.S

SPRINT=*PRINT*

MTS LINE NO. | INTERNAL STMT NO. | **** F I N T I D Y **** INPUT LISTING

```
                      C                                                                 V1000010
                      C   *** MAIN CALLING PROGRAM ***                                  V1000020
                      C                                                                 V1000030
                            INTEGER R, W                                                V1000040
                            EXTERNAL FCT, OUTP                                          V1000050
                            COMMON /PAGE/ NP, HEAD(20), R, W                            V1000060
                            COMMON /CGLOC/ AI(4,2,2), BX(4,2,2), ZZJ(4)                 V1000070
                            COMMON /ROADD/ DZDXC, DZDYC, IROAD, XERCNT(4), XPACK(4)     V1000080
                            DIMENSION PRMT(5), Y(112), DERY(112), AUX(16,112)           V1000090
                            R = 5                                                       V1000100
                            W = 6                                                       V1000110
                         10 CONTINUE                                                    V1000120
                      C                                                                 V1000130
                      C   INITIALIZE FUNCTIONS AND DEGG VARIABLES                       V1000140
                      C                                                                 V1000150
                            DO 20 I = 1, 112                                            V1000160
                              Y(I) = 0.                                                 V1000170
                              DERY(I) = 0.                                              V1000180
                         20 CONTINUE                                                    V1000190
                            PRMT(1) = 0.                                                V1000200
                            PRMT(3) = 0.0025                                            V1000210
                            PRMT(4) = 0.01                                              V1000220
                      C                                                                 V1000230
                      C   CALL INPUT TO READ VEHICLE PARAMETERS                        V1000240
                      C                                                                 V1000250
                            CALL INPUT(Y(7), PRMT(2))                                   V1000260
                      C                                                                 V1000270
                      C   INITIALIZE VELOCITIES                                        V1000280
                      C                                                                 V1000290
                            DO 30 I = 2, 4                                              V1000300
                              Y((I - 1)*28 + 7) = Y(7)                                  V1000310
                         30 CONTINUE                                                    V1000320
                            DERY(7) = 1.0                                               V1000330
                      C                                                                 V1000340
                      C   SET INITIAL CONDITIONS CAUSED BY ROAD                        V1000350
                      C                                                                 V1000360
                            IF (IROAD .LE. 0) GO TO 50                                  V1000370
                            DO 40 I = 1, 4                                              V1000380
                              Y((I - 1)*28 + 5) = -DZDX0                                V1000390
                              Y((I - 1)*28 + 4) = DZDY0                                 V1000400
                              Y((I - 1)*28 + 15) = DZDY0                                V1000410
                              Y((I - 1)*28 + 19) = DZDY0                                V1000420
                              Y((I - 1)*28 + 23) = DZDY0                                V1000430
                              Y((I - 1)*28 + 13) = AI(I,1,1) * DZDX0                    V1000440
                              Y((I - 1)*28 + 17) = AI(I,1,2) * DZDXC                    V1000450
                              Y((I - 1)*28 + 21) = -AI(I,2,1) * DZDX0                   V1000460
                              Y((I - 1)*28 + 25) = -AI(I,2,2) * DZDX0                   V1000470
                              Y((I - 1)*28 + 14) = Y(7) * DZDX0                         V1000480
                              Y((I - 1)*28 + 18) = Y(7) * DZDXC                         V1000490
                              Y((I - 1)*28 + 22) = Y(7) * DZDY0                         V1000500
                              Y((I - 1)*28 + 26) = Y(7) * DZDX0                         V1000510
                         40 Y((I - 1)*28 + 27) = DZDY0                                  V1000520
                         50 CONTINUE                                                    V1000530
                      C                                                                 V1000540
                      C   CALL TO FCT TO INITIALIZE VARIABLES IN FCT                    V1000550
```

```
   MTS                INTERNAL          ****  P R N T I D Y ****
LINE NO.              STMT NO.          INPUT LISTING

   56.                                C                                                                V1000560
   57.                     39             CALL ECT1(Y)                                                 V1000570
   58.                                C                                                                V1000580
   59.                                C    CALL TO OUTPUT TO INITAILIZE VARIABLES IN OUTP              V1000590
   60.                                C                                                                V1000600
   61.                     40             CALL OUTPUT(Y, DERY)                                         V1000610
   62.                                C                                                                V1000620
   63.                                C    TURN CONTROL TO HPCG                                        V1000630
   64.                                C                                                                V1000640
   65.                     41             CALL HPCG(PRMT, Y, DERY, 112, IHLF, ECT, OUTP, AUX)          V1000650
   66.                                C                                                                V1000660
   67.                                C    RETURN FROM HPCG IS ON 3 CONDITIONS:                        V1000670
   68.                                C         1) IHLF DIVIDES OVER 10 TIMES                          V1000680
   69.                                C         2) PRMT(2) TIME LIMIT EXCEEDED                         V1000690
   70.                                C         3) PRMT(5) SET TO 1.0                                  V1000700
   71.                                C                                                                V1000710
   72.                     42             IF (IHLF .LT. 11) GO TO 70                                   V1000720
   73.                     43             CALL OUTP1                                                   V1000730
   74.                     44             WRITE (6,60) IHLF                                            V1000740
   75.                     45          60 FORMAT ('0IHLF = ', I2)                                      V1000750
   76.                     46             CALL EXIT                                                    V1000760
   77.                     47          70 CONTINUE                                                     V1000770
   78.                     48             IF (Y(7) .GT. 0.) CALL OUTP1                                 V1000780
   79.                     49             CALL RERUN                                                   V1000790
   80.                     50             GO TO 10                                                     V1000800
   81.                     51             END                                                          V1000810
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES	
EXIT		SUBR	46	
FCT	(R*4)	EXT.	20	41?
FCT1		SUBR	38	
HPCG		SUBR	41	
INPUT		SUBR	17	
OUTP	(R*4)	EXT.	20	41?
OUTPUT		SUBR	40	
OUTP1		SUBR	43	48
PERUN		SUBR	49	

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES										
AUX	(R*4)	ARRAY		6D	41?									
A1	(R*4)	ARRAY	CCLOC	4C	29	30	31	32						
BX	(R*4)	ARRAY	CCLOC	4C										
DERY	(R*4)	ARRAY		6D	12*	21*	40?	41?						
DZDXO	(R*4)		BOADD	5C	24	25	30	31	32	33	34	35	36	
DZDYO	(R*4)		BOADD	5C	25	26	27	28	37					
HEAD	(R*4)	ARRAY	PAGE	3C										
I	(I*4)			10*	11	12	18*	19	23*	24	25	26	27	28	29
				30	31	32	33	34	35	36	37				
IDLE	(I*4)			41?	42	44								
IROAD	(I*4)		BOADD	5C	22									
NP	(I*4)		PAGE	3C										
PRMT	(R*4)	ARRAY		6D	14*	15*	16*	17?	41?					
R	I*4		PAGE	1D	3C	7*								
W	I*4		PAGE	1D	3C	8*	44							
XBACK	(R*4)	ARRAY	BOADD	5C										
XFRONT	(R*4)	ARRAY	BOADD	5C										
Y	(R*4)	ARRAY		6D	11*	17?	19*	24*	25*	26*	27*	28*	29*	30*	31*
				32*	33*	34*	35*	36*	37*	39?	40?	41?	48		
ZZJ	(R*4)	ARRAY	CCLOC	4C										

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES
10	9		50
20	13		10
30	20		18
40	37		23
50	38		22
60	45	FMT	44
70	47		42

TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION

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 MTS          INTERNAL      **** F I N T I D Y ****
LINE NO.      STMT NO.      INPUT LISTING

                      C                                                                  V1000820
                      C   *** SUBROUTINE INPUT ***                                       V1000830
                      C                                                                  V1000840
                        SUBROUTINE INPUT(VEL, TIME)                                      V1000850
                        INTEGER R, W                                                     V1000860
                        REAL N, KT, NS, K, JA, KBS, MCS                                  V1000870
                        REAL*8 AXLE                                                      V1000880
                        REAL MUZERO                                                      V1000890
                        COMMON /PAGE/ NP, HEAD(20), R, W                                 V1000900
                        COMMON /KEY/ MVEE, KEY(4,2), KDOLLY(4)                           V1000910
                        COMMON /ROADD/ DZDXO, DZDYO, IROAD, XFRONT(4), XRACK(4)          V1000920
                        COMMON /TAND/ ESPLIT(4,2), ESHIFT(4,2), TD(4,2)                  V1000930
                        COMMON /SPMASS/ WHBS(4), BPL(4), A3(4), APHI(4), DELTA(4), VW(4),  V1000940
                       1        VJ(4,3), PW(4), PX(4), PZ(4), PJ(4,3), SNL(4,2), D(4),    V1000950
                       2        PH(4), TCL(4), MCS                                        V1000960
                        COMMON /BRAKE/ BTQ(4,2,2,2), TQ(4,2,2,2,2), NUM(4,2,2,2,2),      V1000970
                       1        XX(4,320), YY(4,320), NTP(1,2), XTP(10), YTP(10), IBK     V1000980
                        COMMON /ANTLK/ IALOPT(32), IOP(32), ILOCK                        V1000990
                        COMMON /TURN/ NCTURN(2,2), TURNX(50), TURNY(50), DELT(4,2,2,2)   V1001000
                        COMMON /CGLOC/ A1(4,2,2), BX(4,2,2), ZZJ(4)                      V1001010
                        COMMON /DRIVE/ ISTEER                                            V1001020
                        COMMON /STATIC/ NS(4,2,2), ET(4), SE(4,2,2,2)                    V1001030
                        COMMON /TIRES/ SRAD(4,2,2,2), CALF(4,2,2,2), DIS(4,2,2,2),       V1001040
                       1        KT(4,2,2,2), CS(4,2,2,2), N(4,2,2,2), CAT(4,2,2,2),       V1001050
                       2        YT(4,2,2,2), YTD(4,2,2,2), TSUM(4,3), XAXFOR(4,2,2),      V1001060
                       3        YAXFOR(4,2,2), FYI(4,2,2,2), FXI(4,2,2,2), FXW(4,2,2,2),  V1001070
                       4        FYW(4,2,2,2), ALFERM(4,2,2,2), SLIP(4,2,2,2)              V1001080
                        COMMON /UNSPM/ K(4,2,2,2), C(4,2,2,2), JA(4,2,2), RCI(4,2,2),    V1001090
                       1        SYI(4,2,2), TRA(4,2,2), ASW(4,2,2), ASM(4,2,2),           V1001100
                       2        AXDELT(4,2,2), PST(4,2,2), KBS(4,2,2), AUXROL(4,2,2),     V1001110
                       3        CE(4,2,2,2)                                               V1001120
                        COMMON /SPRING/ S(4,2,2,2), SD(4,2,2,2), THETAX(4,2,2),          V1001130
                       1        OTHAX(4,2,2), ZAXLE(4,2,2), DZAXLE(4,2,2), DV(4,2,2,2),   V1001140
                       2        NOSPR(4,2,2,2,2,2), DEFSPR(320), FORSPR(320), ZO(4,2,2,2),  V1001150
                       3        XLOAD(4,2,2,2)                                            V1001160
                        COMMON /WHEEL/ WHEELI(4,2,2,2)                                   V1001170
                        COMMON /INOUT/ TINC, IOUT(7)                                     V1001180
                        DIMENSION ITQ(4), DUMMY(10)                                      V1001190
                        DIMENSION VEH(2,3)                                               V1001200
                        DATA VEH /' TRA', 'CTOR', ' TRA', 'ILER', ' TRU', 'CK  '/        V1001210
                      C                                                                  V1001220
                      C   INITIALIZATIONS                                                V1001230
                      C                                                                  V1001240
                        CALL TABIN                                                       V1001250
                        DO 20 IV = 1, 4                                                  V1001260
                           KDOLLY(IV) = 0                                                V1001270
                           ET(IV) = 0.                                                   V1001280
                           PW(IV) = 0.                                                   V1001290
                           PX(IV) = 0.                                                   V1001300
                           PZ(IV) = 0.                                                   V1001310
                           TCL(IV) = 0.                                                  V1001320
                           DO 20 JS = 1, 2                                               V1001330
                              ESPLIT(IV,JS) = 100.                                       V1001340
                              ESHIFT(IV,JS) = 0.                                         V1001350
                              TD(IV,JS) = 0.                                             V1001360
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   MTS      INTERNAL      ****  F T N T I O Y ****
 LINE NO.   STMT NO.      INPUT LISTING

   137.        37              DO 10 KA = 1, 2                                  V1001370
   138.        38                AI(IV,JS,KA) = 0.                              V1001380
   139.        39                ASW(IV,JS,KA) = 0.                             V1001390
   140.        40                SE(IV,JS,KA,1) = 0.                            V1001400
   141.        41                SE(IV,JS,KA,2) = 0.                            V1001410
   142.        42           10   BX(IV,JS,KA) = 0.                              V1001420
   143.        43           20 CONTINUE                                         V1001430
   144.        44              IBK = 0                                          V1001440
   145.        45              IT = 1                                           V1001450
   146.        46              IP = 1                                           V1001460
   147.        47              KEY(1,1) = 0                                     V1001470
   148.        48              KEY(2,1) = 0                                     V1001480
   149.        49              NP = 1                                           V1001490
   150.        50              G = 32.16666                                     V1001500
   151.                    C                                                    V1001510
   152.                    C   READ AND ECHO HEADINGS                           V1001520
   153.                    C                                                    V1001530
   154.        51              WRITE (6,610)                                    V1001540
   155.        52              READ (5,620) HEAD                                V1001550
   156.        53              WRITE (6,630) NP, HEAD                           V1001560
   157.        54              NP = NP + 1                                      V1001570
   158.                    C                                                    V1001580
   159.                    C   READ SIMULATION PARAMETERS: NVEH = NO. OF TRAILERS, VEL = INITIAL  V1001590
   160.                    C     VELOCITY, FT/SEC                               V1001600
   161.                    C                                                    V1001610
   162.        55              READ (5,670) NVEH                                V1001620
   163.        56              NVEH = NVEH + 1                                  V1001630
   164.        57              READ (5,660) VEL                                 V1001640
   165.        58              WRITE (6,680)                                    V1001650
   166.        59              WRITE (6,690) NVEH                               V1001660
   167.        60              WRITE (6,700) VEL                                V1001670
   168.                    C                                                    V1001680
   169.                    C   CHECK FOR CLOSED LOOP STEER OPTION.  IF ISTEER = 1, NO STEER  V1001690
   170.                    C     TABLES ARE USED, BUT PATHFOLLOWERS PARAMETERS ARE ENTERED.  V1001700
   171.                    C                                                    V1001710
   172.        61              READ (5,30) ISTEER                               V1001720
   173.        62           30 FORMAT (I3)                                      V1001730
   174.        63              WRITE (6,1030) ISTEER                            V1001740
   175.        64              IF (ISTEER .GE. 0) GO TO 40                      V1001750
   176.        65              CALL DRIVE1(ISTEER)                              V1001760
   177.        66              GO TO 60                                         V1001770
   178.        67           40 CONTINUE                                         V1001780
   179.                    C                                                    V1001790
   180.                    C   STEER TABLES: NOTURN(1,2) = NO. OF LINES TO BE ENTERED  V1001800
   181.                    C     TURNX = TIME (SEC), TURNY(1-25) = LEFT WHEEL ANGLE (DEG),  V1001810
   182.                    C     TURNY(26-50) = RIGHT WHEEL ANGLE (DEG)         V1001820
   183.                    C                                                    V1001830
   184.        68              NOTURN(1,2) = ISTEER                             V1001840
   185.        69              IF (NOTURN(1,2) .EQ. 0) GO TO 60                 V1001850
   186.        70              NOTURN(1,1) = 1                                  V1001860
   187.        71              IJ = NOTURN(1,2)                                 V1001870
   188.        72              NOTURN(2,1) = 26                                 V1001880
   189.        73              NOTURN(2,2) = IJ + 25                            V1001890
   190.        74              DO 50 I = 1, IJ                                  V1001900
   191.        75                READ (5,650) TURNX(I), TURNY(I), TURNY(I + 25) V1001910
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   MTS          INTERNAL       ****  F I N T I D Y ****
LINE NO.        STMT NO.       INPUT LISTING

192.              76             IF (TURNY(I + 25) .EQ. 0.) TURNY(I + 25) = TURNY(I)                V1001920
193.              77          50 TURNX(I + 25) = TURNX(I)                                           V1001930
194.              78             GO TO 70                                                           V1001940
195.              79          60 IT = 0                                                             V1001950
196.              80             NOTURN(1,2) = 1                                                    V1001960
197.              81             NOTURN(1,1) = 1                                                    V1001970
198.              82             NOTURN(2,1) = 26                                                   V1001980
199.              83             NOTURN(2,2) = 26                                                   V1001990
200.              84             TURNX(1) = 0.                                                      V1002000
201.              85             TURNY(1) = 0.                                                      V1002010
202.              86             TURNX(26) = 0.                                                     V1002020
203.              87             TURNY(26) = 0.                                                     V1002030
204.              88          70 CONTINUE                                                           V1002040
205.                        C                                                                      V1002050
206.                        C   TREADLE PRESSURE TABLE:  NTP(1,2) = NO. OF LINES TO BE ENTERED,     V1002060
207.                        C     XTP(1-10) = TIME (SEC), YTP(1-10) = PRESSURE (PSI)               V1002070
208.                        C                                                                      V1002080
209.              89             NTP(1,1) = 1.                                                      V1002090
210.              90             READ (R,670) NTP(1,2)                                              V1002100
211.              91             IF (NTP(1,2) .NE. 0) GO TO 80                                      V1002110
212.              92             IRK = 1                                                            V1002120
213.              93             IP = 0                                                             V1002130
214.              94             GO TO 100                                                          V1002140
215.              95          80 IJ = NTP(1,2)                                                      V1002150
216.              96             DO 90 I = 1, IJ                                                    V1002160
217.              97               READ (R,640) XTP(I), YTP(I)                                      V1002170
218.              98          90 CONTINUE                                                           V1002180
219.              99             GO TO 110                                                          V1002190
220.             100         100 NTP(1,2) = 1                                                       V1002200
221.             101             XTP(1) = 0.                                                        V1002210
222.             102             YTP(1) = 0.                                                        V1002220
223.             103         110 CONTINUE                                                           V1002230
224.             104             READ (R,660) TIME                                                  V1002240
225.             105             READ (R,660) TINC                                                  V1002250
226.                        C                                                                      V1002260
227.                        C  READ ROAD KEY: IROAD. FOR IROAD < 0 , USER-WRITTEN SUBROUTINE ROAD ISV1002270
228.                        C  REQUIRED TO COMPUTE ROAD ELEVATION AND GRADIENT.                    V1002280
229.                        C                                                                      V1002290
230.             106             READ (R,120) IROAD, DZDXO, DZDYO                                   V1002300
231.             107         120 FORMAT (I2, 2F10.2)                                                V1002310
232.             108             IF (IROAD .GT. 0) GO TO 130                                        V1002320
233.             109             DZDXO = 0.                                                         V1002330
234.             110             DZDYO = 0.                                                         V1002340
235.             111         130 CONTINUE                                                           V1002350
236.                        C                                                                      V1002360
237.             112             READ (R,140) IOUT                                                  V1002370
238.             113         140 FORMAT (7I1)                                                       V1002380
239.                        C                                                                      V1002390
240.                        C   ECHO SIMULATION TABLES                                             V1002400
241.                        C                                                                      V1002410
242.             114             IF (ISTEER .LT. 0) GO TO 150                                       V1002420
243.             115             IF (IT .EQ. 0) WRITE (W,720)                                       V1002430
244.             116             KKE = NOTURN(1,2)                                                  V1002440
245.             117             WRITE (W,730) (TURNX(I),TURNY(I),TURNY(I + 25),I=1,KKE)            V1002450
246.             118         150 CONTINUE                                                           V1002460
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MTS LINE NO.	INTERNAL STMT NO.	**** F I N T I D Y **** INPUT LISTING	
247.	115	IF (IP .EQ. 0) WRITE (W,740) IP	V1002470
248.	120	IF (IP .EQ. 1) WRITE (W,740) NTP(1,2)	V1002480
249.	121	IF (IP .EQ. 0) WRITE (W,720)	V1002490
250.	122	KKE = NTP(1,2)	V1002500
251.	123	WRITE (W,750) (XTP(I),YTP(I),I=1,KKE)	V1002510
252.	124	WRITE (W,710) TIME	V1002520
253.	125	WRITE (W,760) TINC	V1002530
254.	126	IF (IROAD .EQ. 0) WRITE (W,160) IROAD	V1002540
255.	127	IF (IROAD .LT. 0) WRITE (W,170) IROAD	V1002550
256.	128	IF (IROAD .GT. 0) WRITE (W,180) IROAD, DZDXO, DZDYO	V1002560
257.	129	160 FORMAT ('0', T10, 'ROAD KEY = ', I2, ' : FLAT ROAD.')	V1002570
258.	130	170 FORMAT ('0', T10, 'ROAD KEY = ', I2, ' : USER-DEFINED ROAD SURFACE	V1002580
259.		1 ', '(SUBROUTINE ROAD).')	V1002590
260.	131	180 FORMAT ('0', T10, 'ROAD KEY = ', I2, ' : PLANAR ROAD; ', F5.1,	V1002600
261.		1 ' % INITIAL DOWN-GRADE, ', F5.1, ' % INITIAL CROSS-SLOPE.')	V1002610
262.	132	DZDXO = DZDXO / 100.	V1002620
263.	133	DZDYO = DZDYO / 100.	V1002630
264.	134	WRITE (W,190) ICUT	V1002640
265.	135	190 FORMAT ('0', T10, 'OUTPUT PAGE OPTION KEYS: 0 DELETES PAGES'/T10,	V1002650
266.		1 '----------'/T15,	V1002660
267.		2 'SPRUNG MASS', T30, 'SPRUNG MASS', T45, 'SPRUNG MASS', T59,	V1002670
268.		3 'TIRE FORCES', T73, 'BRAKE SUMMARY', T90, 'LATERAL', T105,	V1002680
269.		4 'UNSPRUNG MASS'/T15, 'POSITION', T30, 'VELOCITY', T45,	V1002690
270.		5 'ACCELERATION', T62, 'PAGES', T77, 'PAGES', T91, 'PAGES',	V1002700
271.		6 T105, 'PAGES'//T20, I1, T35, I1, T50, I1, T65, I1, T80, I1,	V1002710
272.		7 T93, I1, T111, I1)	V1002720
273.	136	ISUMT = 0	V1002730
274.	137	DO 200 IEX = 1, 7	V1002740
275.	138	200 ISUMT = ISUMT + IOUT(IEX)	V1002750
276.	139	IF (ISUMT .EQ. 0) TIME = 0.0	V1002760
277.		C	V1002770
278.		C READ VEHICLE PARAMETERS: WEIGHT, SPRUNG MASS DESCRIPTION,	V1002780
279.		C AND GEOMETRY OF PAYLOAD	V1002790
280.		C	V1002800
281.	140	IV = 1	V1002810
282.	141	DO 290 IVEH = 1, MVEH	V1002820
283.	142	DO 210 I = 1, 3	V1002830
284.	143	210 PJ(IVEH,I) = 0.	V1002840
285.	144	IF (IVEH .GT. 2) READ (R,670) KOOLEY(IVEH)	V1002850
286.	145	IF (IVEH .GE. 2) IV = 2	V1002860
287.	146	IF (MVEH .EQ. 1) IV = 3	V1002870
288.	147	IF (IVEH .GT. 2) READ (R,660) APHI(IVEH)	V1002880
289.	148	IF (IVEH .GT. 2) READ (R,660) BBI(IVEH)	V1002890
290.	149	IF (IVEH .GT. 2) READ (R,660) D(IVEH)	V1002900
291.	150	TEL(IVEH) = APHI(IVEH)	V1002910
292.	151	READ (R,660) WHBS(IVEH)	V1002920
293.	152	READ (R,660) SNL(IVEH,1)	V1002930
294.	153	READ (R,660) SNL(IVEH,2)	V1002940
295.	154	READ (R,660) DELTA(IVEH)	V1002950
296.	155	READ (R,660) VJ(IVEH,1)	V1002960
297.	156	READ (R,660) VJ(IVEH,2)	V1002970
298.	157	READ (R,660) VJ(IVEH,3)	V1002980
299.	158	READ (R,660) PW(IVEH)	V1002990
300.	159	IF (PW(IVEH) .EQ. 0.0) GO TO 220	V1003000
301.	160	READ (R,660) PX(IVEH)	V1003010

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   MTS          INTERNAL        **** F T N T I D Y ****
LINE NO.        STMT NO.        INPUT LISTING

302.              161             READ (R,660) PZ(IVEH)                                                  V1003020
303.              162             READ (R,660) PJ(IVEH,1)                                                V1003030
304.              163             READ (R,660) PJ(IVEH,2)                                                V1003040
305.              164             READ (R,660) PJ(IVEH,3)                                                V1003050
306.              165       220   CONTINUE                                                               V1003060
307.                        C                                                                            V1003070
308.                        C   FIFTH WHEEL AND PINTLE HOOK LOCATIONS                                     V1003080
309.                        C                                                                            V1003090
310.              166             IF (IVEH .EQ. 1 .AND. NVEH .GT. 1) READ (R,660) BBI(IVEH)              V1003100
311.              167             BBI(2) = 0.                                                            V1003110
312.              168             IF (IVEH .EQ. 1 .AND. NVEH .GT. 1) READ (R,660) D(IVEH)                V1003120
313.              169             IF (IVEH .EQ. 1 .AND. NVEH .GT. 1) READ (R,660) MC5                    V1003130
314.              170             IF (IVEH .EQ. 1 .OR. IVEH .EQ. NVEH) GO TO 230                         V1003140
315.              171             READ (R,660) A3(IVEH)                                                  V1003150
316.              172             READ (R,660) PH(IVEH)                                                  V1003160
317.              173       230   CONTINUE                                                               V1003170
318.                        C                                                                            V1003180
319.                        C  ECHO VEHICLE PARAMETERS                                                   V1003190
320.                        C                                                                            V1003200
321.              174             ITN = IVEH - 1                                                         V1003210
322.              175             WRITE (W,630) NP, HEAD                                                 V1003220
323.              176             NP = NP + 1                                                            V1003230
324.              177             IF (IVEH .EQ. 1) WRITE (W,770) (VEH(IJ,IV),IJ=1,2)                     V1003240
325.              178             IF (IVEH .GT. 1) WRITE (W,780) (VEH(IJ,IV),IJ=1,2), ITN                V1003250
326.              179             IF (IVEH .LE. 2) GO TO 250                                             V1003260
327.              180             WRITE (W,240) KDOLLY(IVEH)                                             V1003270
328.              181       240   FORMAT (' ', T10, 'DOLLY KEY: 1 = CONVERTER DOLLY, 2 = FIXED DOL       V1003280
329.                          1LY', T100, I15)                                                           V1003290
330.              182             WRITE (W,790) APHI(IVEH)                                               V1003300
331.              183             WRITE (W,980) BBI(IVEH)                                                V1003310
332.              184             WRITE (W,1040) D(IVEH)                                                 V1003320
333.              185       250   CONTINUE                                                               V1003330
334.              186             IF (IVEH .EQ. 1) WRITE (W,800) WHBS(IVEH)                              V1003340
335.              187             IF (IVEH .EQ. 2) WRITE (W,810) WHBS(IVEH)                              V1003350
336.              188             IF (IVEH .GE. 3) WRITE (W,820) WHBS(IVEH)                              V1003360
337.              189             IF (IVEH .NE. 2) WRITE (W,830) SNL(IVEH,1)                             V1003370
338.              190             IF (IVEH .EQ. 2) WRITE (W,840) SNL(IVEH,1)                             V1003380
339.              191             WRITE (W,850) SNL(IVEH,2)                                              V1003390
340.              192             WRITE (W,860) DELTA(IVEH)                                              V1003400
341.              193             WRITE (W,870) VJ(IVEH,1)                                               V1003410
342.              194             WRITE (W,880) VJ(IVEH,2)                                               V1003420
343.              195             WRITE (W,890) VJ(IVEH,3)                                               V1003430
344.              196             WRITE (W,900) PW(IVEH)                                                 V1003440
345.              197             IF (PW(IVEH) .EQ. 0.0) WRITE (W,910)                                   V1003450
346.              198             IF (PW(IVEH) .EQ. 0.) GO TO 260                                        V1003460
347.              199             WRITE (W,920) PX(IVEH)                                                 V1003470
348.              200             WRITE (W,930) PZ(IVEH)                                                 V1003480
349.              201             WRITE (W,940) PJ(IVEH,1)                                               V1003490
350.              202             WRITE (W,950) PJ(IVEH,2)                                               V1003500
351.              203             WRITE (W,960) PJ(IVEH,3)                                               V1003510
352.              204       260   CONTINUE                                                               V1003520
353.              205             IF (IVEH .EQ. 1 .AND. NVEH .GT. 1) WRITE (W,970) BBI(IVEH)             V1003530
354.              206             IF (IVEH .EQ. 1 .AND. NVEH .GT. 1) WRITE (W,1020) D(IVEH)              V1003540
355.              207             IF (IVEH .EQ. 1 .AND. NVEH .GT. 1) WRITE (W,1010) MC5                  V1003550
356.              208             IF (IVEH .EQ. 1 .OR. IVEH .EQ. NVEH) GO TO 270                         V1003560
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 MTS      INTERNAL      **** F I N T I D Y ****
LINE NO.  STMT NO.      INPUT LISTING

 357.      209            WRITE (W,999) A3(IVEH)
 358.      210            WRITE (W,1000) PH(IVEH)                                          V1003570
 359.      211         270   CONTINUE                                                      V1003580
 360.                  C                                                                  V1003590
 361.                  C   CALL APPROPRIATE SUBROUTINE FOR AXLE,TIRE AND SUSPENSION PARAMETES V1003600
 362.                  C                                                                  V1003610
 363.      212            DO 280 J = 1, 2                                                 V1003620
 364.      213              IF (IVEH .EQ. 2 .AND. J .EQ. 1) GO TO 280                     V1003630
 365.      214              CALL TANDEM(IVEH, J)                                          V1003640
 366.      215              ESHIFT(IVEH,J) = ESHIFT(IVEH,J) / 100.                        V1003650
 367.      216              ESPLIT(IVEH,J) = ESPLIT(IVEH,J) / 100.                        V1003660
 368.      217              CALL TIRINT(IVEH, J)                                          V1003670
 369.      218              IF (J .EQ. 2 .AND. IVEH .NE. 2) GO TO 280                     V1003680
 370.      219              WRITE (W,630) NP, HEAD                                        V1003690
 371.      220              NP = NP + 1                                                   V1003700
 372.      221         280   CONTINUE                                                      V1003710
 373.                  C                                                                  V1003720
 374.                  C  READ BRAKE PARAMETERS.                                          V1003730
 375.                  C                                                                  V1003740
 376.      222            CALL BRAKE1(IVEH)                                               V1003750
 377.                  C                                                                  V1003760
 378.                  C   READ NEXT VEHICLE                                            V1003770
 379.                  C                                                                  V1003780
 380.      223         290 CONTINUE                                                       V1003790
 381.      224            READ (R,670) ILOCK                                              V1003800
 382.      225            WRITE (W,300) ILOCK                                             V1003810
 383.      226         300 FORMAT ('0', T10, 'ANTILOCK KEY:  1 INDICATES ANTILOCK WILL BE USEV1003820
 384.                     ID', T110, I5)                                                  V1003830
 385.                  C                                                                  V1003840
 386.                  C   ECHO TABLES                                                   V1003850
 387.                  C                                                                  V1003860
 388.      227            CALL TABECH                                                     V1003870
 389.                  C                                                                  V1003880
 390.                  C   CHECK FOR ANTILOCK SYSTEMS                                    V1003890
 391.                  C                                                                  V1003900
 392.      228            IF (ILOCK .NE. 1) GO TO 320                                     V1003910
 393.      229            DO 310 I = 1, MVEH                                              V1003920
 394.      230              DO 310 J = 1, 2                                               V1003930
 395.      231                DO 310 KK = 1, 2                                            V1003940
 396.      232                  DO 310 L = 1, 2                                           V1003950
 397.      233                    IF (I .EQ. 2 .AND. J .EQ. 1) GO TO 310                  V1003960
 398.      234                    IF (I .EQ. 1 .AND. J .EQ. 1 .AND. KK .EQ. 2)            V1003970
 399.                  1                GO TO 310                                        V1003980
 400.      235                    IF (KEY(I,J) .EQ. 0 .AND. KK .EQ. 2) GO TO 310          V1003990
 401.      236                    JKL = (I - 1) * 8 + (J - 1) * 4 + (KK - 1) * 2 + L      V1004000
 402.      237                    CALL ANTLKR(I, J, KK, L)                                V1004010
 403.      238                    CALL ANTLKW(I, J, KK, L)                                V1004020
 404.      239         310   CONTINUE                                                      V1004030
 405.      240         320   CONTINUE                                                      V1004040
 406.                  C                                                                  V1004050
 407.                  C  CONVERT UNITS                                                   V1004060
 408.                  C                                                                  V1004070
 409.      241            RADIAN = 57.295795                                              V1004080
 410.      242            MCS = MCS / 12. * RADIAN                                        V1004090
 411.      243            DO 360 I = 1, MVEH                                              V1004100
                                                                                          V1004110
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      MTS          INTERNAL       **** F T N T I D Y ****
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  412.               244            WHBS(I) = WHPS(I) / 12.                                                  V1004120
  413.               245            IF (I .NE. 1 .AND. I .NE. MVEH) A3(I) = A3(I) / 12.                      V1004130
  414.               246            IF (I .GT. 2) APHI(I) = APHI(I) / 12.                                    V1004140
  415.               247            BBI(I) = BBI(I) / 12.                                                    V1004150
  416.               248            DELTA(I) = DELTA(I) / 12.                                                V1004160
  417.               249            D(I) = D(I) / 12.                                                        V1004170
  418.               250            PH(I) = PH(I) / 12.                                                      V1004180
  419.               251            TOL(I) = TOL(I) / 12.                                                    V1004190
  420.               252            IF (PW(I) .EQ. 0.) GO TO 340                                             V1004200
  421.               253            PX(I) = PX(I) / 12.                                                      V1004210
  422.               254            PZ(I) = PZ(I) / 12.                                                      V1004220
  423.               255            DO 330 JJ = 1, 3                                                         V1004230
  424.               256              PJ(I,JJ) = PJ(I,JJ) / 12.                                              V1004240
  425.               257        330   CONTINUE                                                               V1004250
  426.               258        340   DO 350 IJ = 1, 3                                                       V1004260
  427.               259        350   VJ(I,IJ) = VJ(I,IJ) / 12.                                              V1004270
  428.               260        360 CONTINUE                                                                 V1004280
  429.               261            IK = NOTURN(1,2)                                                         V1004290
  430.               262            DO 370 I = 1, IK                                                         V1004300
  431.               263              TURNY(I) = TURNY(I) / RADIAN                                           V1004310
  432.               264              TURNY(I + 25) = TURNY(I + 25) / RADIAN                                 V1004320
  433.               265        370 CONTINUE                                                                 V1004330
  434.                             C                                                                        V1004340
  435.                             C   COMPUTE SPRUNG WEIGHTS AND CG LOCATIONS OF SPRUNG MASSES              V1004350
  436.                             C                                                                        V1004360
  437.               266            FT(1) = 0.0                                                              V1004370
  438.               267            WRITE (W,1120) HEAD                                                      V1004380
  439.               268            DO 450 III = 1, MVEH                                                     V1004390
  440.               269              I = MVEH - III + 1                                                     V1004400
  441.               270              VWF = SNL(I,1) - ASW(I,1,1) - ASW(I,1,2)                               V1004410
  442.               271              VWR = SNL(I,2) - ASW(I,2,1) - ASW(I,2,2)                               V1004420
  443.               272              VW(I) = VWF + VWR                                                      V1004430
  444.                             C                                                                        V1004440
  445.                             C   LOCATE EMPTY SPRUNG MASS CG IN RELATION TO AXLES                     V1004450
  446.                             C                                                                        V1004460
  447.               273              A1(I,1,1) = (TD(I,1)*VWF*(1. - FSPLIT(I,1)) + (WHBS(I) + .5*(TD(V1004470
  448.                              1   I,1) - TD(I,2)))*VWR*FSPLIT(I,2) + (WHBS(I) + .5*(TD(I,1) + TD( V1004480
  449.                              2   I,2)))*VWR*(1. - FSPLIT(I,2))) / VW(I)                             V1004490
  450.               274              A1(I,1,2) = A1(I,1,1) - TD(I,1)                                        V1004500
  451.               275              A1(I,2,1) = WHBS(I) + .5 * (TD(I,1) - TD(I,2)) - A1(I,1,1)             V1004510
  452.               276              A1(I,2,2) = A1(I,2,1) + TD(I,2)                                        V1004520
  453.                             C                                                                        V1004530
  454.                             C   CALCULATE CHANGE OF MASS AND CG LOCATION DUE TO PAYLOAD              V1004540
  455.                             C                                                                        V1004550
  456.               277              FVM = VW(I) / G                                                        V1004560
  457.               278              PM = PW(I) / G                                                         V1004570
  458.               279              VWF = VW(I)                                                            V1004580
  459.               280              VW(I) = VW(I) + PW(I)                                                  V1004590
  460.               281              A2F = (A1(I,2,1) + TD(I,2)/2.)                                         V1004600
  461.               282              A1(I,2,1) = (A2F*VWF + PW(I)*PX(I)) / VW(I) - TD(I,2) / 2              V1004610
  462.               283              A2L = A1(I,2,1) + TD(I,2) / 2.                                         V1004620
  463.               284              A1(I,2,2) = A1(I,2,1) + TD(I,2)                                        V1004630
  464.               285              A1(I,1,2) = WHBS(I) - (A1(I,2,1) + TD(I,2)/2.) - TD(I,1) / 2.          V1004640
  465.               286              A1(I,1,1) = A1(I,1,2) + TD(I,1)                                        V1004650
  466.                             C                                                                        V1004660
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MTS      INTERNAL      ****  P R I N T O U T ****
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467.                C   CALCULATE CHANGE IN INERTIAS                                    V1004670
469.                C                                                                   V1004680
469.          287       DUMMY(1) = A2E * 12.                                          V1004690
470.          288       DUMMY(3) = DELTA(I) * 12.                                     V1004700
471.          289       DUMMY(5) = VJ(I,1) * 12.                                      V1004710
472.          290       DUMMY(7) = VJ(I,2) * 12.                                      V1004720
473.          291       DUMMY(9) = VJ(I,3) * 12.                                      V1004730
474.                C                                                                   V1004740
475.          292       DPZ = PZ(I) - DELTA(I)                                        V1004750
476.          293       DDELTA = PM(I) * DPZ / VW(I)                                  V1004760
477.          294       DELTA(I) = DELTA(I) + DDELTA                                  V1004770
478.          295       DA = A2E - A2L                                                V1004780
479.          296       DPX = A2E - PX(I)                                             V1004790
480.          297       VJ(I,1) = VJ(I,1) + DDELTA ** 2 * EVM + PJ(I,1) + (DPZ - DDELTA)V1004800
481.                1    ** 2 * PM                                                    V1004810
482.          298       DVY = (DA**2 + DDELTA**2) ** .5                               V1004820
483.          299       DPY = (DPZ**2 + DPX**2) ** .5 - DVY                           V1004830
484.          300       VJ(I,2) = VJ(I,2) + DVY ** 2 * EVM + PJ(I,2) + DPY ** 2 * PM  V1004840
485.          301       VJ(I,3) = VJ(I,3) + DA ** 2 * EVM + PJ(I,3) + (DPX - DA) ** 2 * V1004850
486.                1   PM                                                           V1004860
487.                C                                                                   V1004870
488.                C   CALCULATE REDISTRIBUTION OF FRONT AND REAR SUSPENSION LOADS   V1004880
489.                C                                                                   V1004890
490.          302       IF (KDOLLY(I) .EQ. 1) FT(I - 1) = (VWF*BBL(I)) / (APHI(I) - BBL(V1004900
491.                1   I))                                                          V1004910
492.          303       VWR = (AI(I,1,1) - TD(I,1)/2.) * VW(I) / WHBS(I)              V1004920
493.          304       IF (I .EQ. MVEH) GO TO 380                                    V1004930
494.          305       IF (I .GT. 1 .AND. KDOLLY(I + 1) .EQ. 1) VWR = VWR + (FT(I - 1)*V1004940
495.                1   (APHI(I) - BBL(I)) + FT(I)*(WHBS(I) + BBL(I) + APHI(I))) / (  V1004950
496.                2   WHBS(I) + BBL(I))                                            V1004960
497.          306   380   CONTINUE                                                    V1004970
498.          307       VWF = VW(I) - VWR                                             V1004980
499.          308       IF (I .GT. 1) VWF = VWF - FT(I - 1) + FT(I)                   V1004990
500.          309       SNL(I,1) = VWF + ASW(I,1,1) + ASW(I,1,2)                      V1005000
501.          310       SNL(I,2) = VWR + ASW(I,2,1) + ASW(I,2,2)                      V1005010
502.          311       IF (I .EQ. 2) FT(1) = SNL(2,1)                                V1005020
503.          312   390   CONTINUE                                                    V1005030
504.                C                                                                   V1005040
505.                C   COMPUTE NORMAL STATIC LOADS                                   V1005050
506.                C                                                                   V1005060
507.          313       IF (I .EQ. 1 .AND. MVEH .GT. 1) GO TO 410                     V1005070
508.          314       DO 400 JS = 1, 2                                              V1005080
509.          315         NS(I,JS,1) = SNL(I,JS) * FSPLIT(I,JS)                       V1005090
510.          316         NS(I,JS,2) = SNL(I,JS) * (1. - FSPLIT(I,JS))                V1005100
511.          317   400   CONTINUE                                                    V1005110
512.          318       GO TO 420                                                     V1005120
513.          319   410   FTR = FT(I) * (WHBS(I) - BBL(I)) / WHBS(I)                  V1005130
514.          320       VWR = SNL(I,2) - (ASW(I,2,1) + ASW(I,2,2))                    V1005140
515.          321       VWF = SNL(I,1) - ASW(I,1,1)                                   V1005150
516.          322       NS(I,2,1) = (VWR + FTR) * FSPLIT(I,2) + ASW(I,2,1)            V1005160
517.          323       NS(I,2,2) = (VWR + FTR) * (1. - FSPLIT(I,2)) + ASW(I,2,2)     V1005170
518.          324       NS(I,1,1) = VWF + (FT(I) - FTR) + ASW(I,1,1)                  V1005180
519.          325   420   CONTINUE                                                    V1005190
520.                C                                                                   V1005200
521.                C   CALCULATE EQUILIBRIUM POINT FOR NONLINEAR SPRINGS            V1005210
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  MTS          INTERNAL       **** F T N T I D Y ****
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  522.                  C                                                                                V1005220
  523.           326              DO 440 JSUS = 1, 2                                                      V1005230
  524.           327                IF (I .EQ. 2 .AND. JSUS .EQ. 1) GO TO 440                             V1005240
  525.           328                JKK = 1                                                               V1005250
  526.           329                IF (KEY(I,JSUS) .GT. 0) JKK = 2                                       V1005260
  527.           330                DO 430 KAX = 1, JKK                                                   V1005270
  528.           331                  DO 430 LSIDE = 1, 2                                                 V1005280
  529.           332                    IF (K(I,JSUS,KAX,LSIDE) .GT. 0.) GO TO 430                        V1005290
  530.                  C                                                                                V1005300
  531.                  C   COMPUTE STATIC LOAD IN SPRING                                                V1005310
  532.                  C                                                                                V1005320
  533.           333                    XLOAD(I,JSUS,KAX,LSIDE) = (NS(I,JSUS,KAX) - ASW(I,JSUS,         V1005330
  534.                1                 KAX)) / 2.                                                       V1005340
  535.           334                    CALL TABLE(NCSPR(I,JSUS,KAX,LSIDE,1), NCSPR(I,JSUS,KAX,          V1005350
  536.                1                      LSIDE,2), ECRSPR, DEFSPR, XLOAD(I,JSUS,KAX,LSIDE), 0)V1005360
  537.           335                    ZO(I,JSUS,KAX,LSIDE) = 0                                          V1005370
  538.           336             430    CONTINUE                                                          V1005380
  539.           337             440  CONTINUE                                                            V1005390
  540.                  C                                                                                V1005400
  541.           338              DUMMY(2) = A2L * 12.                                                    V1005410
  542.           339              DUMMY(4) = DELTA(I) * 12.                                               V1005420
  543.           340              DUMMY(6) = VJ(I,1) * 12.                                                V1005430
  544.           341              DUMMY(8) = VJ(I,2) * 12.                                                V1005440
  545.           342              DUMMY(10) = VJ(I,3) * 12.                                               V1005450
  546.                  C                                                                                V1005460
  547.                  C   TOTAL MASS CG LOCATIONS IN RELATION TO AXLES                                  V1005470
  548.                  C                                                                                V1005480
  549.           343                BX(I,1,1) = ((WHBS(I) + .5*TD(I,1))*SNL(I,2) + TD(I,1)*SNL(I,1)*V1005490
  550.                1   (1. - FSPLIT(I,1))) / (SNL(I,1) + SNL(I,2))                                    V1005500
  551.           344                BX(I,1,2) = BX(I,1,1) - TD(I,1)                                       V1005510
  552.           345                BX(I,2,1) = -(WHBS(I) + .5*(TD(I,1) - TD(I,2))) + BX(I,1,1)           V1005520
  553.           346                BX(I,2,2) = BX(I,2,1) - TD(I,2)                                       V1005530
  554.           347                IJ = I - 1                                                            V1005540
  555.           348                IVT = 1                                                               V1005550
  556.           349                IF (MVEH .EQ. 1) IVT = 3                                              V1005560
  557.           350                IF (I .GE. 2) IVT = 2                                                 V1005570
  558.           351                IF (I .EQ. 1) WRITE (W,1050) (VEH(IJJJ,IVT),IJJJ=1,2), PW(I)         V1005580
  559.           352                IF (I .GT. 1) WRITE (W,1060) IJ, PW(I)                                V1005590
  560.           353                WRITE (W,1070) (VEH(IJJJ,IVT),IJJJ=1,2), (DUMMY(IEE),IEE=1,2),       V1005600
  561.                1   (VEH(IJJJ,IVT),IJJJ=1,2), (DUMMY(IEE),IEE=3,4), (VEH(IJJJ,IVT),              V1005610
  562.                2   IJJJ=1,2), (DUMMY(IEE),IEE=5,6), (VEH(IJJJ,IVT),IJJJ=1,2),                   V1005620
  563.                3   (DUMMY(IEE),IEE=7,8), (VEH(IJJJ,IVT),IJJJ=1,2), (DUMMY(IEE),IEE=V1005630
  564.                4   9,10)                                                                         V1005640
  565.           354       450 CONTINUE                                                                  V1005650
  566.           355            IF (ISTEER .LT. 0) CALL DRIVE2                                           V1005660
  567.                  C                                                                                V1005670
  568.                  C   AXDELT IS STATIC DISTANCE FROM AXLE UP TO CG                                 V1005680
  569.                  C                                                                                V1005690
  570.           356              DO 460 IVEH = 1, MVEH                                                   V1005700
  571.           357                DO 460 JSUS = 1, 2                                                    V1005710
  572.           358                  JKK = 1                                                             V1005720
  573.           359                  IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                                  V1005730
  574.           360                  IF (IVEH .EQ. 1 .AND. JSUS .EQ. 1) JKK = 1                          V1005740
  575.           361                  DO 460 KAX = 1, JKK                                                 V1005750
  576.           362                    AXDELT(IVEH,JSUS,KAX) = DELTA(IVEH) - (SRAD(IVEH,JSUS,KAX,1)V1005760
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     MTS          INTERNAL        ****  F T N T I D Y ****
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     577.                        1       +SRAD(IVEH,JSUS,KAX,2)) / 2.                                          V1005770
     578.              363     460 CONTINUE                                                                      V1005780
     579.              364         DO 480 IVEH = 1, MVEH                                                         V1005790
     580.              365           ZZJ(IVEH) = 0.                                                              V1005800
     581.              366           DO 470 JSUS = 1, 2                                                          V1005810
     582.              367             DO 470 KAX = 1, 2                                                         V1005820
     583.              368               ZZJ(IVEH) = ZZJ(IVEH) + BX(IVEH,JSUS,KAX) ** 2 * ASW(IVEH,            V1005830
     584.                             1   JSUS,KAX) / 32.16666 + JA(IVEH,JSUS,KAX)                              V1005840
     585.              369     470     CONTINUE                                                                  V1005850
     586.              370           ZZJ(IVEH) = ZZJ(IVEH) + WJ(IVEH,3) + (A1(IVEH,1,1) - TD(IVEH,1)/V1005860
     587.                             1  2. - BX(IVEH,1,1)) ** 2 * WW(IVEH) / 32.16666                          V1005870
     588.              371     480 CONTINUE                                                                      V1005880
     589.                      C                                                                                 V1005890
     590.                      C   ECHO STATIC LOADS                                                           V1005900
     591.                      C                                                                                 V1005910
     592.              372         GVW = 0.                                                                      V1005920
     593.              373         DO 500 I = 1, MVEH                                                            V1005930
     594.              374           DO 500 J = 1, 2                                                             V1005940
     595.              375             JKK = 1                                                                   V1005950
     596.              376             IF (I .EQ. 2 .AND. J .EQ. 1) GO TO 500                                    V1005960
     597.              377             IF (KEY(I,J) .GT. 0) JKK = 2                                              V1005970
     598.              378             IF (I .EQ. 1 .AND. J .EQ. 1) JKK = 1                                      V1005980
     599.              379             DO 490 KAX = 1, JKK                                                       V1005990
     600.              380     490       GVW = GVW + NS(I,J,KAX)                                                 V1006000
     601.              381     500 CONTINUE                                                                      V1006010
     602.              382         WRITE (W,1080)                                                                V1006020
     603.              383         WRITE (W,1090)                                                                V1006030
     604.              384         DO 520 I = 1, MVEH                                                            V1006040
     605.              385           DO 520 J = 1, 2                                                             V1006050
     606.              386             JKK = 1                                                                   V1006060
     607.              387             IF (I .EQ. 2 .AND. J .EQ. 1) GO TO 520                                    V1006070
     608.              388             IF (KEY(I,J) .GT. 0) JKK = 2                                              V1006080
     609.              389             IF (I .EQ. 1 .AND. J .EQ. 1) JKK = 1                                      V1006090
     610.              390             DO 510 KAX = 1, JKK                                                       V1006100
     611.              391               WRITE (W,1100) I, J, KAX, NS(I,J,KAX)                                   V1006110
     612.              392     510       CONTINUE                                                                V1006120
     613.              393     520 CONTINUE                                                                      V1006130
     614.              394         WRITE (W,1110) GVW                                                            V1006140
     615.                      C                                                                                 V1006150
     616.                      C   TOTAL MASS CENTER ECHO                                                       V1006160
     617.                      C                                                                                 V1006170
     618.              395         IVT = 1                                                                       V1006180
     619.              396         DO 550 I = 1, MVEH                                                            V1006190
     620.              397           IF (I .GT. 2) GO TO 530                                                     V1006200
     621.              398           DUM1 = BX(I,1,1) * 12.                                                      V1006210
     622.              399           GO TO 540                                                                   V1006220
     623.              400     530   DUM1 = (BX(I,1,1) - TD(I,1)/2. - BB1(I)) * 12.                             V1006230
     624.              401     540   DUM2 = ZZI(I) * 12.                                                         V1006240
     625.              402           IF (MVEH .EQ. 1) IVT = 3                                                    V1006250
     626.              403           IF (I .EQ. 1) WRITE (W,560) (VEH(IJK,IVT),IJK=1,2), DUM1                    V1006260
     627.              404           IF (I .EQ. 2) WRITE (W,570) DUM1                                            V1006270
     628.              405           IF (I .EQ. 3) WRITE (W,580) DUM1                                            V1006280
     629.              406           IF (I .EQ. 4) WRITE (W,590) DUM1                                            V1006290
     630.              407           WRITE (W,600) DUM2                                                          V1006300
     631.              408     550 CONTINUE                                                                      V1006310
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MTS LINE NO. | INTERNAL STMT NO. | **** F T N T I C Y **** INPUT LISTING

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                                                                                V1006320
                      RETURN                                                    V1006330
C                                                                               V1006340
C   FORMATS                                                                     V1006350
C                                                                               V1006360
  560 FORMAT ('0THE', 2A4, ' TOTAL MASS CENTER IS ', F12.3, ' INCHES ',         V1006370
     1       'BEHIND THE FRONT AXLE')                                           V1006380
  570 FORMAT ('0THE FIRST TRAILER TOTAL MASS CENTER IS ', F12.3,                V1006390
     1       ' INCHES', ' BEHIND THE KINGPIN')                                  V1006400
  580 FORMAT ('0THE SECOND TRAILER TOTAL MASS CENTER IS ', F12.3,               V1006410
     1       ' INCHES BEHIND THE TURNTABLE CENTER')                             V1006420
  590 FORMAT ('0THE THIRD TRAILER TOTAL MASS CENTER IS ', F12.3,                V1006430
     1       ' INCHES', ' BEHIND THE TURNTABLE CENTER')                         V1006440
  600 FORMAT (' THE TOTAL YAW MOMENT OF INERTIA IS ', F12.3,                    V1006450
     1       ' IN-LB-SEC**2'/)                                                  V1006460
  610 FORMAT (///'***BEGIN INPUT***')                                           V1006470
  620 FORMAT (20A4)                                                             V1006480
  630 FORMAT ('1', T36, 'HSRI TRUCK AND TRACTOR-TRAILER DYNAMIC ',              V1006490
     1       'RESPONSE SIMULATION - T3DRS,V1', T115, 'INPUT PAGE NO.',          V1006500
     2       I3//T36, 20A4///)                                                  V1006510
  640 FORMAT (2F10.2)                                                           V1006520
  650 FORMAT (3F10.2)                                                           V1006530
  660 FORMAT (F15.3)                                                            V1006540
  670 FORMAT (I2)                                                               V1006550
  680 FORMAT ('0', T5, 'SIMULATION OPERATION PARAMETERS:'/T5,                   V1006560
     1       '-----------------------------'/)                                  V1006570
  690 FORMAT ('0', T10, 'VEHICLE CONFIGURATION (NUMBER OF TRAILERS -',          V1006580
     1       ' ENTER 0 FOR A STRAIGHT TRUCK)', T100, I15)                       V1006590
  700 FORMAT (' ', T10, 'INITIAL VELOCITY (FT/SEC)', T100, F15.2)               V1006600
  710 FORMAT (' ', T10, 'MAXIMUM SIMULATION TIME (SEC)', T100, F15.2)           V1006610
  720 FORMAT (' ', T15, '* ZERO ENTRY INDICATES NO FURTHER TABLE DATA IS        V1006620
     1', ' NECESSARY - THE FOLLOWING TABLE IS ASSIGNED INTERNALLY *')           V1006630
  730 FORMAT (' ', T15, 'TABLE ENTRIES:', T67, 'TIME (SEC)', T79,               V1006640
     1       'LEFT', ' WHEEL (DEG)', T100, 'RIGHT WHEEL (DEG)'/T67,             V1006650
     2       '----------', T79, '----------------', T100,                       V1006660
     3       '----------------'/' ', 25(T60,F15.2,T76,F15.2,T92,F15.2/)         V1006670
     4       )                                                                  V1006680
  740 FORMAT ('0', T10, 'TREADLE PRESSURE TABLE (NUMBER OF LINES)',             V1006690
     1       T100, I15)                                                         V1006700
  750 FORMAT (' ', T15, 'TABLE ENTRIES:', T83, 'TIME (SEC)', T97,               V1006710
     1       'PRESSURE (PSI)'/T83, '----------', T97, '--------------'/         V1006720
     2       25(T76,F15.2,T92,F15.2/))                                          V1006730
  760 FORMAT (' ', T10, 'TIME INCREMENT OF OUTPUT (SEC)', T100, F15.2)          V1006740
  770 FORMAT ('0', T4, 2A4, ' PARAMETERS'/T5, '------------------'/)            V1006750
  780 FORMAT ('0', T4, 2A4, ' NO.', I2, ' PARAMETERS'/T5,                       V1006760
     1       '--------------', '----------'/)                                   V1006770
  790 FORMAT (' ', T10, 'DISTANCE FROM DOLLY SUSPENSION TO PINTLE HOOK '        V1006780
     1       , '(IN)', T100, F15.2)                                             V1006790
  800 FORMAT (' ', T10, 'WHEELBASE - DISTANCE FROM FRONT AXLE TO CENTER         V1006800
     1', ' OF REAR SUSPENSION (IN)', T100, F15.2)                               V1006810
  810 FORMAT (' ', T10, 'WHEELBASE - DISTANCE FROM KINGPIN TO CENTER OF         V1006820
     1', 'REAR SUSPENSION (IN)', T100, F15.2)                                   V1006830
  820 FORMAT (' ', T10, 'WHEELBASE - DISTANCE FROM CENTER OF FRONT SUSP.        V1006840
     1 ', 'TO CENTER OF REAR SUSP. (IN)', T100, F15.2)                          V1006850
  830 FORMAT (' ', T10, 'BASE VEHICLE CURB WEIGHT ON FRONT SUSPENSION (LV       V1006860
     1B)', T100, F15.2)                                                         V1006870
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 MTS          INTERNAL      **** F T N T I D Y ****
LINE NO.      STMT NO.      INPUT LISTING

687.           438      840 FORMAT (' ', T10, 'BASE VEHICLE KINGPIN STATIC LOAD (LB)', T10C,  V1CC6870
688.                       1       F15.2)                                                    V1006880
689.           439      850 FORMAT (' ', T10, 'BASE VEHICLE CURB WEIGHT ON REAR SUSPENSION (LBV1006890
690.                       1)', T100, F15.2)                                                 V1006900
691.           440      860 FORMAT (' ', T10, 'SPRUNG MASS CG HEIGHT (IN. ABOVE GROUND)',     V1006910
692.                       1       T100, F15.2)                                              V1006920
693.           441      870 FORMAT (' ', T10, 'SPRUNG MASS ROLL MOMENT OF INERTIA ',          V1006930
694.                       1       '(IN-LB-SEC**2)', T100, F15.2)                            V1006940
695.           442      880 FORMAT (' ', T10, 'SPRUNG MASS PITCH MOMENT OF INERTIA',          V1CC6950
696.                       1       ' (IN-LB-SEC**2)', T100, F15.2)                           V1006960
697.           443      890 FORMAT (' ', T1C, 'SPRUNG MASS YAW MOMENT OF INERTIA',            V1006970
698.                       1       ' (IN-LB-SEC**2)', T100, F15.2)                           V1006980
699.           444      900 FORMAT (' ', T1C, 'PAYLOAD WEIGHT (LB)', T100, F15.2)             V1006990
700.           445      910 FORMAT (' ', T15, '*** ZERO ENTRY INDICATES NO PAYLOAD ***'/T15,  V1007000
701.                       1       '*** FIVE PAYLOAD DESCRIPTION PARAMETERS ARE NOT ENTERED **V1007010
702.                       2*')                                                              V1007020
703.           446      920 FORMAT (' ', T15, 'PAYLOAD DISTANCE AHEAD OF REAR SUSPENSION CENTEVIC07030
704.                       1R', '(IN)', T10C, F15.2)                                         V1007040
705.           447      930 FORMAT (' ', T15, 'PAYLOAD CG HEIGHT (IN. ABOVE GROUND)', T100,   V1007050
706.                       1       F15.2)                                                    V1007060
707.           448      940 FORMAT (' ', T15, 'PAYLOAD ROLL MOMENT OF INERTIA',               V1007070
708.                       1       '(IN-LB-SEC**2)', T100, F15.2)                            V1007080
709.           449      950 FORMAT (' ', T15, 'PAYLOAD PITCH MOMENT OF INERTIA',              V1007090
710.                       1       '(IN-LB-SEC**2)', T100, F15.2)                            V1007100
711.           450      960 FORMAT (' ', T15, 'PAYLOAD YAW MOMENT OF INERTIA',                V1007110
712.                       1       '(IN-LB-SEC**2)', T100, F15.2)                            V1007120
713.           451      970 FORMAT (' ', T10, 'FIFTH WHEEL LOCATION ', '(IN. AHEAD OF REAR SUSV1007130
714.                       1P. CENTER)', T100, F15.2)                                        V1007140
715.           452      980 FORMAT (' ', T10, 'TURNTABLE LOCATION (IN AHEAD OF SUSP. CENTER)',V1007150
716.                       1       T100, F15.2)                                              V1007160
717.           453      990 FORMAT (' ', T10, 'LOCATION OF PINTLE HOOK (IN BEHIND REAR ',     V1007170
718.                       1       'SUSP. CENTER)', T100, F15.2)                             V1007180
719.           454     1000 FORMAT (' ', T10, 'HEIGHT OF PINTLE HOOK (IN ABOVE GROUND)', T100,V1CC7190
720.                       1       F15.2)                                                    V1007200
721.           455     1010 FORMAT (' ', T10, '5TH WHEEL STIFFNESS (IN-LB/DEG)', T100, F15.2) V1007210
722.           456     1020 FORMAT (' ', T10, 'FIFTH WHEEL HEIGHT ABOVE GROUND (IN)', T100,   V1007220
723.                       1       F15.2)                                                    V1007230
724.           457     1030 FORMAT (' ', T10, 'STEER TABLE (NUMBER OF LINES):  POSITIVE -STEERV1CC724C
725.                       1', ' ANGLE TABLE, NEGATIVE - PATH FOLLOWER TABLE', T110, I5)     V1007250
726.           458     1040 FORMAT (' ', T10, 'TURNTABLE HEIGHT ABOVE GROUND (IN)', T100,     V1007260
727.                       1       F15.2)                                                    V1007270
728.                  C                                                                      V1007280
729.           459     1050 FORMAT ('0', 2A4, 1CX, 'PAYLOAD = ', F10.3, 1X, 'LBS', T88,       V1007290
730.                       1       'EMPTY', 11X, 'LOADED'/)                                  V1007300
731.           460     1060 FORMAT ('0TRAILER NO.', I2, 10X, 'PAYLOAD = ', F10.3, 1X, 'LBS.', V1007310
732.                       1       T88, 'EMPTY', 11X, 'LOADED'/)                             V1007320
733.           461     1070 FORMAT (' DISTANCE FROM', 2A4, ' SPRUNG MASS CENTER TO',          V1007330
734.                       1       ' REAR SUSPENSION (IN)', T79, 2F15.3/' DISTANCE FROM', 2A4,V1007340
735.                       2       ' SPRUNG MASS CENTER TO GROUND (IN)', T79, 2F15.3/        V1007350
736.                       3       ' ROLL MOMENT OF INERTIA OF', 2A4, ' SPRUNG MASS (IN-LB-SECV1007360
737.                       4**2)', T79, 2F15.3/' PITCH MOMENT OF INERTIA OF', 2A4,           V1007370
738.                       5       ' SPRUNG MASS (IN-LB-SEC**2)', T79, 2F15.3/               V1007380
739.                       6       ' YAW MOMENT OF INERTIA OF', 2A4, ' SPRUNG MASS (IN-LB-SEC*V1007390
740.                       7*2)', T79, 2F15.3////)                                           V1007400
741.           462     1080 FORMAT ('0THE STATIC LOADS ON THE AXLES ARE:')                    V1007410
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   MTS          INTERNAL       **** F T N T I D Y ****
LINE NO.        STMT NO.       INPUT LISTING

  742.            463      1090 FORMAT (' ', 'AXLE NUMBER', 6X, 'LOAD')                                  V1007420
  743.            464      1100 FORMAT (' ', 'NS(', I1, ',', I1, ',', I1, ')', T15, F10.3)               V1007430
  744.            465      1110 FORMAT (T15, '----------'/T3, 'TOTAL', T15, F10.3)                        V1007440
  745.            466      1120 FORMAT ('1', T36, 'HSRI TRUCK AND TRACTOR-TRAILER DYNAMIC ',             V1007450
  746.                          1       'RESPONSE SIMULATION - T3DRS,V1', T115, 'SUMMARY PAGE'//         V1007460
  747.                          2       T36, 20A4)                                                       V1007470
  748.            467           ENTRY RERUN                                                             V1007480
  749.            468           READ (R,670) NEXT                                                       V1007490
  750.            469           IF (NEXT .EQ. 0) CALL EXIT                                              V1007500
  751.            470           RETURN                                                                  V1007510
  752.            471           END                                                                     V1007520
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*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES
ANTIKR		SUBR	237
ANTIKW		SUBR	238
BRAKE1		SUBR	222
DRIVE1		SUBR	65
DRIVE2		SUBR	359
EXIT		SUBR	469
INPUT		SUBR	10
PERUN	(R*4)	ENTRY	4670
TABECH		SUBR	227
TABIN		SUBR	25
TABLE		SUBR	334
TANDEM		SUBR	214
TIRINI		SUBR	217
<EXIT>		SUBR	409 470

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES
ALEPRM	(R*4)	ARRAY	TIRES	17C
APHI	(R*4)	ARRAY	SPMASS	10C 147* 150 182 246* 302 305
ASM	(R*4)	ARRAY	UNSPM	18C
ASW	(R*4)	ARRAY	UNSPM	18C 39* 270 271 309 310 320 321 322 323 324 333 368
AUXROT	(R*4)	ARRAY	UNSPM	18C
AXDELT	(R*4)	ARRAY	UNSPM	18C 362*
AXLE	R*8			4D
A1	(R*4)	ARRAY	CGLOC	14C 38* 273* 274* 275* 276* 281 282* 283 284* 285* 286* 303 370
A2F	(R*4)			281* 282 287 295 296
A2L	(R*4)			283* 295 338
A3	(R*4)	ARRAY	SPMASS	10C 171* 209 245*
BB1	(R*4)	ARRAY	SPMASS	10C 148* 166* 167* 183 205 247* 302 305 319 400
BTQ	(R*4)	ARRAY	BRAKE	11C
BX	(R*4)	ARRAY	CGLOC	14C 42* 343* 344* 345* 346* 368 370 398 400
C	(R*4)	ARRAY	UNSPM	18C
CALF	(R*4)	ARRAY	TIRES	17C
CAT	(R*4)	ARRAY	TIRES	17C
CF	(R*4)	ARRAY	UNSPM	18C
CS	(R*4)	ARRAY	TIRES	17C
D	(R*4)	ARRAY	SPMASS	10C 149* 169* 184 206 249*
DA	(R*4)			295* 298 301
DDELTA	(R*4)			293* 294 297 298
DEFSPR	(R*4)	ARRAY	SPRING	19C 334?
DELT	(R*4)	ARRAY	TURN	13C
DELTA	(R*4)	ARRAY	SPMASS	10C 154* 192 248* 288 292 294* 339 362
DPX	(R*4)			296* 299 301
DPY	(R*4)			299* 300
DPZ	(R*4)			292* 293 297 299
DTHAX	(R*4)	ARRAY	SPRING	19C
DTS	(R*4)	ARRAY	TIRES	17C
DUMMY	(R*4)	ARRAY		22C 287* 289* 289* 290* 291* 338* 339* 340* 341* 342* 353
DUM1	(R*4)			399* 400* 403 404 405 406
DUM2	(R*4)			401* 407

DV	(R*4)	ARRAY	SPRING	190									
DVY	(R*4)			298*	299	300							
DZAXLE	(R*4)	ARRAY	SPRING	190									
DZDXO	(R*4)		ROADD	80	106*	109*	128	132*					
DZDYO	(R*4)		ROADD	80	106	110*	128	133*					
EVM	(R*4)			277*	297	300	301						
EOPSPR	(R*4)	ARRAY	SPRING	190	334?								
ESHIFT	(R*4)	ARRAY	LAND	90	35*	215*							
ESPLIT	(R*4)	ARRAY	LAND	90	34*	216*	273	315	316	322	323	343	
ET	(R*4)	ARRAY	STATIC	160	28*	266*	302*	305	309	311*	319	324	
ETR	(R*4)			319*	322	323	324						
EXT	(R*4)	ARRAY	TIRES	170									
EXW	(R*4)	ARRAY	TIRES	170									
EYT	(R*4)	ARRAY	TIRES	170									
EYW	(R*4)	ARRAY	TIRES	170									
G	(R*4)			50*	277	278							
GVW	(R*4)			272*	380*	394							
HEAD	(R*4)	ARRAY	PAGE	60	52	53	175	219	267				
I	(I*4)			74*	75	76	77	96*	97	117*	123*	142*	143	229*	233
				234	235	236	237?	239?	243*	244	245	246	247	248	249
				250	251	252	253	254	256	259	262*	263	264	269*	270
				271	272	273	274	275	276	277	278	279	280	281	282
				283	284	285	286	288	289	290	291	292	293	294	296
				297	300	301	302	303	304	305	307	308	309	310	311
				313	315	316	327	329	332	333	334	335	339	340	341
				342	343	344	345	346	347	350	351	352	373*	376	377
				378	380	384*	387	388	389	391	396*	397	398	400	401
				403	404	405	406								
IALOPT	(I*4)	ARRAY	ANTLK	120									
IBK	(I*4)		BRAKE	110	44*	92*							
IEE	(I*4)			353*									
IEX	(I*4)			137*	138								
IEY	(I*4)			268*	269								
IJ	(I*4)			71*	73	74	95*	96	177*	178*	258*	259	347*	352	
IJJJ	(I*4)			351*	353*										
IJK	(I*4)			403*											
IK	(I*4)			261*	262										
ILOCK	(I*4)		ANTLK	120	224	225	228								
IOP	(I*4)	ARRAY	ANTLK	120											
IOUT	(I*4)	ARRAY	IMOUT	210	112	134	138								
IP	(I*4)			46*	93*	119	120	121							
IROAD	(I*4)		ROADD	80	106*	108	126	127	128						
ISTEER	(I*4)		DRIVE	150	61	63	64	65?	68	114	355				
ISUMT	(I*4)			136*	138*	139									
IT	(I*4)			45*	79*	115									
ITN	(I*4)			174*	178										
ITO	(I*4)	ARRAY		220											
IV	(I*4)			26*	27	28	29	33	31	32	34	35	36	38	39
				40	41	42	140*	145*	146*	177	179				
IVEH	(I*4)			141*	143	144	145	147	148	149	150	151	152	153	154
				155	156	157	158	159	160	161	162	163	164	166	168
				169	170	171	172	174	177	178	179	180	182	183	184
				186	187	188	189	190	191	192	193	194	195	196	197
				198	199	200	201	202	203	205	206	207	208	209	210
				213	214?	215	216	217?	218	222?	356*	359	360	362	364*
				365	368	370									
IVT	(I*4)			348*	349*	350*	351	353	395*	402*	403				
J	(I*4)			212*	213	214?	215	216	217?	219	230*	233	234	235	236

			237?	238?	374*	376	377	378	390	385*	387	388	389	391
JA	R*4	ARRAY	UNSPM	3D	18C	36E								
JJ	(I*4)			255*	256									
JKK	(I*4)			328*	329*	33C	358*	359*	360*	361	375*	377*	378*	379	386*
				389*	389*	390								
JKL	(I*4)			236*										
JS	(I*4)			33*	34	35	36	38	39	40	41	42	314*	315	316
JSUS	(I*4)			326*	327	329	332	333	334	335	357*	359	360	362	366*
				368											
K	R*4	ARRAY	UNSPM	3D	18C	332									
KA	(I*4)			37*	38	39	40	41	42						
KAX	(I*4)			330*	332	333	334	335	361*	362	367*	368	379*	380	390*
				391											
KDOLLY	(I*4)	ARRAY	KEY	7C	27*	144*	180	302	305						
KEY	(I*4)	ARRAY	KEY	7C	47*	48*	235	329	359	377	388				
KK	(I*4)			231*	234	235	236	237?	238?						
KKE	(I*4)			116*	117	122*	123								
KPS	R*4	ARRAY	UNSPM	3D	18C										
KT	R*4	ARRAY	TIRES	3D	17C										
L	(I*4)			232*	236	237?	238?								
LSIDE	(I*4)			331*	332	333	334	335							
MCS	R*4		SPMASS	3D	1DC	169	207	242*							
MUZERO	R*4			5D											
MVEH	(I*4)		KEY	7C	56*	141	146	166	168	169	170	205	206	207	208
				229	243	245	268	269	304	313	349	356	364	373	384
				396	402										
N	R*4	ARRAY	TIRES	3D	17C										
NEXT	(I*4)			468	469										
NOSPR	(I*4)	ARRAY	SPRING	19C	334?										
NRTURN	(I*4)	ARRAY	TURN	13C	68*	69	70*	71	72*	73*	80*	81*	82*	83*	116
				261											
NP	(I*4)		PAGE	6C	49*	53	54*	175	176*	219	220*				
NS	R*4	ARRAY	STATIC	3D	16C	315*	316*	322*	323*	324*	333	380	391		
NTP	(I*4)	ARRAY	BRAKE	11C	89*	90*	91	95	100*	120	122				
NUM	(I*4)	ARRAY	BRAKE	11C											
NVEH	(I*4)			55	56	59									
PH	(R*4)	ARRAY	SPMASS	1DC	172*	210	250*								
PJ	(R*4)	ARRAY	SPMASS	1DC	143*	162*	163*	164*	201	202	203	256*	297	300	301
PM	(R*4)			278*	297	300	301								
PW	(R*4)	ARRAY	SPMASS	19C	29*	158*	159	196	197	198	252	278	280	282	293
				351	352										
PX	(R*4)	ARRAY	SPMASS	1DC	30*	16C*	199	253*	282	284					
PZ	(R*4)	ARRAY	SPMASS	1DC	31*	161*	200	254*	292						
Q	(R*4)			334?	335										
R	I*4		PAGE	2D	6C	52R	55R	57R	61R	75R	90R	97R	104R	105R	106R
				112R	144R	147R	148R	149R	151R	152R	153R	154R	155R	156R	157R
				158R	160R	161R	162R	163R	164R	166R	168R	169R	171R	172R	224R
				468R											
RADIAN	(R*4)			241*	242	263	264								
RCI	(R*4)	ARRAY	UNSPM	18C											
RST	(R*4)	ARRAY	UNSPM	19C											
S	(R*4)	ARRAY	SPRING	19C											
SD	(R*4)	ARRAY	SPRING	19C											
SF	(R*4)	ARRAY	STATIC	15C	40*	41*									
SLIP	(R*4)	ARRAY	TIRES	17C											
SNI	(R*4)	ARRAY	SPMASS	1DC	152*	153*	189	190	191	270	271	309*	310*	311	315
				316	320	321	343								
SRAD	(R*4)	ARRAY	TIRES	17C	362										

SYT	(R*4)	ARRAY	UNSPM	19C									
TD	(R*4)	ARRAY	TAND	9C	36*	273	274	275	276	281	282	283	284	285	296
				303	343	344	345	346	370	400					
THETAX	(R*4)	ARRAY	SPRING	19C											
TIME	(R*4)			1	104	124	139*								
TINC	(R*4)		INOUT	21C	105	125									
TOL	(R*4)	ARRAY	SPMASS	10C	32*	150*	251*								
TQ	(R*4)	ARRAY	BRAKE	11C											
TRA	(R*4)	ARRAY	UNSPM	18C											
TSUM	(R*4)	ARRAY	TIRES	17C											
TURNX	(R*4)	ARRAY	TURN	13C	75*	77*	84*	86*	117						
TURNY	(R*4)	ARRAY	TURN	13C	75*	76*	85*	87*	117	263*	264*				
VEH	(R*4)	ARRAY		23C	24	177	178	351	353	403					
VEL	(R*4)			1	57	60									
VJ	(R*4)	ARRAY	SPMASS	10C	155*	156*	157*	193	194	195	259*	289	290	291	297*
				300*	301*	340	341	342	370						
VW	(R*4)	ARRAY	SPMASS	10C	272*	273	277	279	280*	282	293	303	307	370	
VWF	(R*4)			279*	282										
VWF	(R*4)			270*	272	273	302	307*	308*	309	321*	324			
VWR	(R*4)			271*	272	273	303*	305*	307	310	320*	322	323		
W	I*4		PAGE	2D	6C	51W	53W	58W	59W	60W	63W	115W	117W	119W	120W
				121W	123W	124W	125W	126W	127W	128W	134W	175W	177W	178W	180W
				182W	183W	184W	186W	187W	188W	189W	190W	191W	192W	193W	194W
				195W	196W	197W	199W	200W	201W	202W	203W	205W	206W	207W	209W
				210W	219W	225W	267W	351W	352W	353W	382W	393W	391W	394W	403W
				404W	405W	406W	407W								
WHBS	(R*4)	ARRAY	SPMASS	10C	151*	186	187	188	244*	273	275	285	303	305	319
				343	345										
WHEELI	(R*4)	ARRAY	WHEEL	20C											
XAXFOR	(R*4)	ARRAY	TIRES	17C											
XBACK	(R*4)	ARRAY	ROADD	8C											
XFRONT	(R*4)	ARRAY	ROADD	8C											
XLOAD	(R*4)	ARRAY	SPRING	19C	333*	334?									
XTP	(R*4)	ARRAY	BRAKE	11C	97*	101*	123								
XX	(R*4)	ARRAY	BRAKE	11C											
YAXFOR	(R*4)	ARRAY	TIRES	17C											
YI	(R*4)	ARRAY	TIRES	17C											
YTD	(R*4)	ARRAY	TIRES	17C											
YTP	(R*4)	ARRAY	BRAKE	11C	97*	102*	123								
YY	(R*4)	ARRAY	BRAKE	11C											
ZAXLE	(R*4)	ARRAY	SPRING	19C											
ZZJ	(R*4)	ARRAY	CGLOC	14C	365*	369*	370*	401							
ZO	(R*4)	ARRAY	SPRING	19C	335*										

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES	
10	42		37	
20	43		26	33
30	62	FMT	61	
40	67		64	
50	77		74	
60	79		66	69
70	89		79	
80	95		91	
90	99		96	
100	100		94	

110	103		99										
120	107	FMT	106										
130	111		108										
140	113	FMT	112										
150	118		114										
160	120	FMT	126										
170	130	FMT	127										
180	131	FMT	129										
190	135	FMT	134										
200	138		137										
210	143		142										
220	165		159										
230	173		170										
240	181	FMT	180										
250	185		179										
260	204		198										
270	211		208										
280	221		212	213	218								
290	223		141										
300	226	FMT	225										
310	239		229	230	231	232	233	234	235				
320	240		228										
330	257		255										
340	259		252										
350	259		258										
360	260		243										
370	265		262										
380	306		304										
390	312												
400	317		314										
410	315		313										
420	325		318										
430	336		330	331	332								
440	337		326	327									
450	354		268										
460	363		356	357	361								
470	369		366	367									
480	371		364										
490	380		379										
500	391		373	374	376								
510	392		390										
520	393		384	385	387								
530	400		397										
540	401		399										
550	408		396										
560	410	FMT	403										
570	411	FMT	404										
580	412	FMT	405										
590	413	FMT	406										
600	414	FMT	407										
610	415	FMT	51										
620	416	FMT	52										
630	417	FMT	53	175	219								
640	418	FMT	97										
650	419	FMT	75										
660	420	FMT	57	104	105	147	148	149	151	152	153	154	155	156
			157	158	160	161	162	163	164	166	168	169	171	172
670	421	FMT	55	99	144	224	468							

680	422	FMT	58	
690	423	FMT	59	
700	424	FMT	60	
710	425	FMT	124	
720	426	FMT	115	121
730	427	FMT	117	
740	429	FMT	119	120
750	429	FMT	123	
760	430	FMT	125	
770	431	FMT	177	
780	432	FMT	178	
790	433	FMT	182	
800	434	FMT	186	
810	435	FMT	187	
820	436	FMT	188	
830	437	FMT	189	
840	438	FMT	190	
850	439	FMT	191	
860	440	FMT	192	
870	441	FMT	193	
880	442	FMT	194	
890	443	FMT	195	
900	444	FMT	196	
910	445	FMT	197	
920	446	FMT	199	
930	447	FMT	200	
940	448	FMT	201	
950	449	FMT	202	
960	450	FMT	203	
970	451	FMT	205	
980	452	FMT	183	
990	453	FMT	209	
1000	454	FMT	210	
1010	455	FMT	207	
1020	456	FMT	206	
1030	457	FMT	63	
1040	458	FMT	184	
1050	459	FMT	351	
1060	460	FMT	352	
1070	461	FMT	353	
1080	462	FMT	342	
1090	463	FMT	383	
1100	464	FMT	391	
1110	465	FMT	394	
1120	466	FMT	267	

TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION

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 MTS          INTERNAL      **** F T N T I D Y ****
LINE NO.      STMT NO.      INPUT LISTING

753.                  C                                                                                V1007530
754.                  C   *** SUBROUTINE OUTPUT ***                                                    V1007540
755.                  C                                                                                V1007550
756.            1       SUBROUTINE OUTPUT(Y, DERY)                                                     V1007560
757.                  C   VALUES FOR Y((J-1)*28+I), WHERE J=1,MVEH; I=1,28                             V1007570
758.                  C         1 = X          4 = PHI          7 = U          10 = P                   V1007580
759.                  C         2 = Y          5 = THETA        8 = V          11 =                     V1007590
760.                  C         3 = Z          6 = PST          9 = W          12 = R                   V1007600
761.                  C                                                                                V1007610
762.                  C   OUTPUT ARRAY DIMENSION IS (VEH NO.,PAGE,COLUMN,LINE)                        V1007620
763.                  C                                                                                V1007630
764.                  C   BEGIN DECLARATIONS                                                           V1007640
765.                  C                                                                                V1007650
766.            2       INTEGER R, W                                                                   V1007660
767.            3       REAL*8 AXLE                                                                    V1007670
768.            4       REAL N, KT, NS, K, JA, KTON, KPIN                                              V1007680
769.            5       DIMENSION FINC(3,3)                                                            V1007690
770.            6       DIMENSION YDR(5)                                                               V1007700
771.            7       DIMENSION OUT(4,19,14,41), NPAGE(4)                                            V1007710
772.            8       DIMENSION CM(4,2,2,2), DMD(4,2,2,2), XMUX(4,2,2,2), YMUY(4,2,2,2)              V1007720
773.            9       DIMENSION IPR(4,19), ER(4,2)                                                   V1007730
774.           10       DIMENSION Y(112), DERY(112), PRMT(5)                                           V1007740
775.           11       DIMENSION ACLONG(4), ACLAT(4), SSLIP(4), TRAD(4), SSOLD(4),                    V1007750
776.                  1         XOLD(4), BETAD(4), ADEN(4), CAM(4), GAMD(4)                           V1007760
777.           12       COMMON /SPRING/ S(4,2,2,2), SD(4,2,2,2), THETAX(4,2,2),                        V1007770
778.                  1        DTHAX(4,2,2), ZAXLE(4,2,2), DZAXLE(4,2,2), DV(4,2,2,2),               V1007780
779.                  2        NOSPR(4,2,2,2,2), DEFSPR(320), FORSPR(320), ZO(4,2,2,2),              V1007790
780.                  3        XLOAD(4,2,2,2)                                                        V1007800
781.           13       COMMON /STATIC/ NS(4,2,2), ET(4), SF(4,2,2,2)                                  V1007810
782.           14       COMMON /INOUT/ IINC, IOUT(7)                                                   V1007820
783.           15       COMMON /TOLT/ TALIGN(4,2,2,2)                                                  V1007830
784.           16       COMMON /ROADD/ DZDXO, DZDYC, IROAD, XEFCNT(4), XBACK(4)                        V1007840
785.           17       COMMON /BOLT/ P(4,2,2,2), FO(4,2,2,2), TLST(4,2,2,2), T(4,2,2,2),              V1007850
786.                  1        PIRO                                                                  V1007860
787.           18       COMMON /WSPD/ UW(4,2,2,2)                                                      V1007870
788.           19       COMMON /UNSPM/ K(4,2,2,2), C(4,2,2,2), JA(4,2,2), RCI(4,2,2),                  V1007880
789.                  1        SYI(4,2,2), TRA(4,2,2), ASW(4,2,2), ASM(4,2,2),                       V1007890
790.                  2        AXDELT(4,2,2), RST(4,2,2), KRS(4,2,2), AUXROL(4,2,2),                 V1007900
791.                  3        CF(4,2,2,2)                                                           V1007910
792.           20       COMMON /SPMASS/ WHBS(4), BBI(4), A3(4), APHI(4), DELTA(4), VW(4),              V1007920
793.                  1        VJ(4,3), PW(4), PX(4), PZ(4), PJ(4,3), SNL(4,2), D(4),                V1007930
794.                  2        PH(4), TCL(4), MCS                                                    V1007940
795.           21       COMMON /TRANS/ CPSI(4), SPSI(4), A(4,3,3), BZ(4,3,3)                           V1007950
796.           22       COMMON /CGLOC/ AL(4,2,2), BX(4,2,2), ZZJ(4)                                    V1007960
797.           23       COMMON /FCTOUT/ XBAR(4,3), PHIBAR(4,3), UBAR(4,3), PBAR(4,3)                   V1007970
798.           24       COMMON /CMACC/ XDDCM(4), YDDCM(4), PSIDD(4), DPX(4), DBY(4)                    V1007980
799.           25       COMMON /TURN/ NOTURN(2,2), TURNX(50), TURNY(50), DELT(4,2,2,2)                 V1007990
800.           26       COMMON /DRIVE/ ISTEER                                                          V1008000
801.           27       COMMON /BRAKE/ BTQ(4,2,2,2), TQ(4,2,2,2,2), NUM(4,2,2,2,2),                    V1008010
802.                  1        XX(4,320), YY(4,320), NTP(1,2), XTP(10), YTP(10), IBK                 V1008020
803.           28       COMMON /PAGE/ NP, HEAD(20), R, W                                               V1008030
804.           29       COMMON /KEY/ MVEH, KEY(4,2), KDOLLY(4)                                         V1008040
805.           30       COMMON /TAND/ ESPLIT(4,2), ESHIFT(4,2), TD(4,2)                                V1008050
806.           31       COMMON /TIRES/ SRAD(4,2,2,2), CALF(4,2,2,2), DTS(4,2,2,2),                     V1008060
807.                  1        KT(4,2,2,2), CS(4,2,2,2), N(4,2,2,2), CAT(4,2,2,2),                   V1008070
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 MTS          INTERNAL      **** F T N T I D Y ****
LINE NO.      STMT NO.      INPUT LISTING

 809.                 2       YI(4,2,2,2), YIO(4,2,2,2), ISUM(4,3), XAXFOR(4,2,2),          V1008080
 809.                 3       YAXFOR(4,2,2), FYI(4,2,2,2), FXI(4,2,2,2), FXW(4,2,2,2),      V1008090
 810.                 4       FYW(4,2,2,2), ALFRM(4,2,2,2), SLIP(4,2,2,2)                   V1008100
 811.          32      COMMON /PIN/ FPINX(4), FPINY(4), FPIN(3), XMCM, DEFPIN, PSIDOL(4),V1008110
 812.                 1       TFORAX(4), TFORBX(4), TFORAY(4), TFORBY(4), TFORAZ, TFORBZ V1008120
 813.          33      COMMON /WHEEL/ WFFELI(4,2,2,2)                                        V1008130
 814.          34      DIMENSION VEH(2,3), TIRES(3,2), SIDE(3,2), AXLE(3,2)                  V1008140
 815.          35      DATA VEH /' TRA', 'CTOR', ' TRA', 'ILER', ' TRU', 'CK  '/              V1008150
 816.          36      DATA TIRES /' FRO', 'NT T', 'IRES', ' REA', 'R TI', 'RES'/             V1008160
 817.          37      DATA SIDE /'LEFT', ' SID', 'E   ', 'RIGH', 'T SI', 'DE  '/            V1008170
 818.          38      DATA AXLE /'LEADING ', 'TANDEM A', 'XLE      ', 'TRAILING',           V1008180
 819.                 1     ' TANDEM ', 'AXLE    '/                                         V1008190
 820.          39      DATA FR /'FRON', 'T SU', 'SPEN', 'SION', 'REAR', ' SUS', 'PENS',      V1008200
 821.                 1     'ION '/                                                        V1008210
 822.                C                                                                     V1008220
 823.                C  INITIALIZE CONSTANTS AND VARIABLES USED IN OUTPUT                  V1008230
 824.                C                                                                     V1008240
 825.          40      RADIAN = 57.2957795                                                   V1008250
 826.          41      PI = 3.1415926                                                        V1008260
 827.          42      DZDX = 0.                                                             V1008270
 828.          43      DZDY = C.                                                             V1008280
 829.          44      DO 10 I = 1, MVEH                                                     V1008290
 830.          45        SSOLD(I) = 0.0                                                      V1008300
 831.          46        XOLD(I) = 1.0                                                       V1008310
 832.          47   10 CONTINUE                                                            V1008320
 833.          48      KSTOP = 0                                                             V1008330
 834.          49      LINE = C                                                              V1008340
 835.          50      STEP = 0.0                                                            V1008350
 836.          51      PAGE = 1.                                                             V1008360
 837.          52      XPRINT = 0.                                                           V1008370
 838.                C                                                                     V1008380
 839.                C  DETERMINE WHICH PAGES ARE TO BE PRINTED FOR EACH VEHICLE           V1008390
 840.                C                                                                     V1008400
 841.          53      DO 20 I = 1, MVEH                                                     V1008410
 842.          54        DO 20 II = 1, 19                                                    V1008420
 843.          55   20 IPR(I,II) = 1                                                       V1008430
 844.          56      DO 50 J = 1, 2                                                        V1008440
 845.          57        DO 50 I = 1, MVEH                                                   V1008450
 846.          58          IF (KEY(I,J) .GT. 0) GO TO 50                                     V1008460
 847.          59          IADD = 5                                                          V1008470
 848.          60          IF (J .EQ. 2) IADD = 7                                            V1008480
 849.          61          DO 30 II = 1, 4                                                   V1008490
 850.          62            IC = (II - 1) * 4                                               V1008500
 851.          63   30       IPR(I,IADD + IC) = 0                                           V1008510
 852.          64          IF (I .NE. 2 .OR. J .GT. 1) GO TO 50                              V1008520
 853.          65          DO 40 II = 1, 4                                                   V1008530
 854.          66            IC = (II - 1) * 4                                               V1008540
 855.          67   40       IPR(I,4 + IC) = 0                                              V1008550
 856.          68   50 CONTINUE                                                            V1008560
 857.          69      DO 200 I = 1, 7                                                       V1008570
 858.          70        IF (IOUT(I) .EQ. 1) GO TO 200                                       V1008580
 859.          71        GO TO (60, 80, 100, 120, 140, 160, 180), I                          V1008590
 860.          72   60   DO 70 IV = 1, MVEH                                                 V1008600
 861.          73   70   IPR(IV,1) = 0                                                      V1008610
 862.          74        GO TO 200                                                           V1008620
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     MTS          INTERNAL        ****  F I N I T O Y ****
   LINE NO.       STMT NO.        INPUT LISTING

     863.           75          80    DO 90 IV = 1, MVEH                                                    V1008630
     864.           76          90    IER(IV,2) = 0                                                         V1008640
     865.           77                GO TO 200                                                             V1008650
     866.           78         100    DO 110 IV = 1, MVEH                                                   V1008660
     867.           79         110    IER(IV,3) = 0                                                         V1008670
     868.           80                GO TO 200                                                             V1008680
     869.           81         120    DO 130 IV = 1, MVEH                                                   V1008690
     870.           82                  DO 130 IIV = 4, 7                                                   V1008700
     871.           83         130    IER(IV,IIV) = 0                                                       V1008710
     872.           84                GO TO 200                                                             V1008720
     873.           85         140    DO 150 IV = 1, MVEH                                                   V1008730
     874.           86                  DO 150 IIV = 8, 11                                                  V1008740
     875.           87         150    IER(IV,IIV) = 0                                                       V1008750
     876.           88                GO TO 200                                                             V1008760
     877.           89         160    DO 170 IV = 1, MVEH                                                   V1008770
     878.           90                  DO 170 IIV = 12, 15                                                 V1008780
     879.           91         170    IER(IV,IIV) = 0                                                       V1008790
     880.           92                GO TO 200                                                             V1008800
     881.           93         180    DO 190 IV = 1, MVEH                                                   V1008810
     882.           94                  DO 190 IIV = 16, 19                                                 V1008820
     883.           95         190    IPR(IV,IIV) = 0                                                       V1008830
     884.           96         200 CONTINUE                                                                 V1008840
     885.                     C                                                                            V1008850
     886.                     C    IPR IS NOW OUTPUT KEY.  IF IPR(IVEH,J) = 1, PAGE IS PRINTED, IF = 0     V1008860
     887.                     C    PAGE IS DELETED FROM OUTPUT.                                            V1008870
     888.                     C                                                                            V1008880
     889.                     C    INITIALIZE DOLLY ACCELERATION                                           V1008890
     890.                     C                                                                            V1008900
     891.           97              IF (MVEH .LT. 3) GO TO 220                                              V1008910
     892.           98              DO 210 I = 3, MVEH                                                      V1008920
     893.           99                DEX(I) = 0.                                                           V1008930
     894.          100                DBY(I) = 0.                                                           V1008940
     895.          101         210 CONTINUE                                                                 V1008950
     896.          102         220 CONTINUE                                                                 V1008960
     897.                     C                                                                            V1008970
     898.                     C    INITIALIZE THE A(I,J) AND B(I,J)                                        V1008980
     899.                     C                                                                            V1008990
     900.          103              DO 250 J = 1, MVEH                                                      V1009000
     901.          104                CPSI(J) = COS(PHIBAR(J,3))                                            V1009010
     902.          105                SPSI(J) = SIN(PHIBAR(J,3))                                            V1009020
     903.          106                A(J,1,1) = CPSI(J) * COS(PHIBAR(J,2))                                 V1009030
     904.          107                A(J,2,1) = -SPSI(J) + PHIBAR(J,1) * CPSI(J) * PHIBAR(J,2)             V1009040
     905.          108                A(J,3,1) = SPSI(J) * PHIBAR(J,1) + CPSI(J) * PHIBAR(J,2)              V1009050
     906.          109                A(J,1,2) = SPSI(J) * COS(PHIBAR(J,2))                                 V1009060
     907.          110                A(J,2,2) = CPSI(J) + PHIBAR(J,1) * SPSI(J) * PHIBAR(J,2)              V1009070
     908.          111                A(J,3,2) = -CPSI(J) * PHIBAR(J,1) + SPSI(J) * PHIBAR(J,2)             V1009080
     909.          112                A(J,1,3) = -PHIBAR(J,2)                                               V1009090
     910.          113                A(J,2,3) = PHIBAR(J,1)                                                V1009100
     911.          114                A(J,3,3) = COS(PHIBAR(J,2)) * COS(PHIBAR(J,1))                        V1009110
     912.          115                DO 240 I = 1, 3                                                       V1009120
     913.          116                  DO 240 JI = 1, 3                                                    V1009130
     914.          117                    IF (I .EQ. JI) GO TO 230                                          V1009140
     915.          118                    BZ(J,I,JI) = 0.                                                   V1009150
     916.          119                    GO TO 240                                                         V1009160
     917.          120         230        BZ(J,I,JI) = 1.                                                   V1009170
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MTS LINE NO. | INTERNAL STMT NO. | **** F T N T I D Y **** INPUT LISTING

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  918.      121       240   CONTINUE                                                          V1009180
  919.      122             BZ(J,2,1) = PHIBAR(J,1) * PHIBAR(J,2)                           V1009190
  920.      123             BZ(J,3,1) = PHIBAR(J,2)                                         V1009200
  921.      124             BZ(J,3,2) = -PHIBAR(J,1)                                        V1009210
  922.      125             BZ(J,3,3) = 1.                                                  V1009220
  923.      126       250 CONTINUE                                                          V1009230
  924.      127           DO 260 IVEH = 1, MVEH                                             V1009240
  925.      128             DO 260 JSUS = 1, 2                                              V1009250
  926.      129               DO 260 KAX = 1, 2                                             V1009260
  927.      130                 DO 260 LSIDE = 1, 2                                         V1009270
  928.      131       260 DELT(IVEH,JSUS,KAX,LSIDE) = 0.0                                   V1009280
  929.      132           CALL TABLE(NOTURN(1,1), NOTURN(1,2), TURNX, TURNY, 0.0,           V1009290
  930.                   1     DELT(1,1,1,1))                                              V1009300
  931.      133           CALL TABLE(NOTURN(2,1), NOTURN(2,2), TURNX, TURNY, 0.0,           V1009310
  932.                   1     DELT(1,1,1,2))                                              V1009320
  933.                 C                                                                   V1009330
  934.                 C   INITIALIZATIONS COMPLETE, RETURN TO CALLING PROGRAM             V1009340
  935.                 C                                                                   V1009350
  936.      134          RETURN                                                           V1009360
  937.                 C                                                                   V1009370
  938.                 C   ENTRY POINT FROM EPCG                                          V1009380
  939.                 C                                                                   V1009390
  940.      135          ENTRY OUTP(X,Y,DERY,IHLF,NDIM,PRMT)                              V1009400
  941.      136          IF (Y(7) .LT. .5) KSTOP = 1                                      V1009410
  942.      137          XPRINT = X                                                       V1009420
  943.                 C                                                                   V1009430
  944.                 C   OUTPUT COMPUTATIONS - LONGITUDINAL AND LATERAL ACCELERATIONS    V1009440
  945.                 C                                                                   V1009450
  946.      138          DO 310 I = 1, MVEH                                               V1009460
  947.      139            IV = (I - 1) * 28                                              V1009470
  948.      140            ACLONG(I) = DERY(IV + 7) + Y(IV + 11) * Y(IV + 9) - Y(IV + 12) *V1009480
  949.                   1   Y(IV + 8)                                                    V1009490
  950.      141            ACLAT(I) = DERY(IV + 8) - Y(IV + 10) * Y(IV + 9) + Y(IV + 7) *  V1009500
  951.                   1  Y(IV + 12)                                                   V1009510
  952.                 C                                                                   V1009520
  953.                 C   SET UP MASS CENTER ACCELERATIONS FOR CONSTRAINT ESTIMATES IN FCT V1009530
  954.                 C                                                                   V1009540
  955.      142            XDDCM(I) = ACLONG(I)                                           V1009550
  956.      143            YDDCM(I) = ACLAT(I)                                            V1009560
  957.      144            PSIDD(I) = DERY(IV + 12)                                       V1009570
  958.                 C                                                                   V1009580
  959.                 C   SIDESLIP AND TURN RADIUS                                       V1009590
  960.                 C                                                                   V1009600
  961.      145            IF (Y(IV + 7) .EQ. 0.0) GO TO 280                              V1009610
  962.      146            IF (ABS(Y(IV + 8)/Y(IV + 7)) .GT. 0.2) GO TO 270               V1009620
  963.      147            SSLIP(I) = Y(IV + 8) / Y(IV + 7)                               V1009630
  964.      148            GO TO 290                                                      V1009640
  965.      149       270  SSLIP(I) = ATAN(Y(IV + 8)/Y(IV + 7))                          V1009650
  966.      150            GO TO 290                                                      V1009660
  967.      151       280  SSLIP(I) = PI / 2.                                             V1009670
  968.      152       290  CONTINUE                                                       V1009680
  969.      153            BETAD(I) = (SSLIP(I) - SSOLD(I)) / (X - XOLD(I))               V1009690
  970.      154            SSOLD(I) = SSLIP(I)                                            V1009700
  971.      155            XOLD(I) = X                                                    V1009710
  972.      156            ACCN(I) = Y(IV + 12) + BETAD(I)                                V1009720
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MTS LINE NO.	INTERNAL STMT NO.	**** E N T I C Y **** INPUT LISTING	
973.	157	IF (ABS(ADEN(I)) .LT. C.0001) GO TO 300	V1009730
974.	158	TRAD(I) = SQRT(Y(IV + 7)*Y(IV + 7) + Y(IV + 8)*Y(IV + 8)) /	V1009740
975.		1 ADEN(I)	V1009750
976.	159	GO TO 310	V1009760
977.	160	300 TRAD(I) = 123456789.	V1009770
978.	161	310 CONTINUE	V1009780
979.		C	V1009790
980.		C GAMMA AND GAMMADOT (TRAILERS ONLY)	V1009800
981.		C	V1009810
982.	162	IF (MVEH .LT. 2) GO TO 340	V1009820
983.	163	DO 320 I = 2, MVEH	V1009830
984.	164	IV = (I - 1) * 28	V1009840
985.	165	GAM(I) = (Y((IV - 28) + 6) - Y(IV + 6)) * RADIAN	V1009850
986.	166	GAMD(I) = (DERY((IV - 28) + 6) - DERY(IV + 6)) * RADIAN	V1009860
987.	167	320 CONTINUE	V1009870
988.	168	IF (MVEH .LT. 3) GO TO 340	V1009880
989.		C	V1009890
990.		C COMPUTE DOLLY ACCELERATIONS	V1009900
991.		C	V1009910
992.	169	DO 330 I = 3, MVEH	V1009920
993.		C	V1009930
994.		C DOLLY ACCELERATIONS IN TRAILER AXIS SYSTEM	V1009940
995.		C	V1009950
996.	170	DTX = XDDCM(I) - Y(12 + 28*(I - 1)) ** 2 * (AL(I,1,1) - TD(I,1)/	V1009960
997.		1 2.)	V1009970
998.	171	DTY = YDDCM(I) + PSIDD(I) * (AL(I,1,1) - TD(I,1)/2.)	V1009980
999.		C	V1009990
1000.		C DOLLY ACCELERATIONS IN DOLLY AXIS SYSTEM	V1010000
1001.		C	V1010010
1002.	172	DDX(I) = DTX * COS(DELT(I,1,1,1)) + DTY * SIN(DELT(I,1,1,1))	V1010020
1003.	173	DDY(I) = DTY * COS(DELT(I,1,1,1)) - DTX * SIN(DELT(I,1,1,1))	V1010030
1004.	174	330 CONTINUE	V1010040
1005.	175	340 CONTINUE	V1010050
1006.		C	V1010060
1007.		C COMPUTE WHEEL SPEED,MUX,MUY	V1010070
1008.		C	V1010080
1009.	176	DO 360 I = 1, MVEH	V1010090
1010.	177	DO 360 JS = 1, 2	V1010100
1011.	178	IF (I .EQ. 2 .AND. JS .EQ. 1) GO TO 360	V1010110
1012.	179	JKK = 1	V1010120
1013.	180	IF (KEY(I,JS) .NE. 0) JKK = 2	V1010130
1014.	181	DO 350 KAX = 1, JKK	V1010140
1015.	182	DO 350 LS = 1, 2	V1010150
1016.	183	OM(I,JS,KAX,LS) = UBAR(I,1) * (1. - SLIP(I,JS,KAX,LS)) /	V1010160
1017.		1 SRAD(I,JS,KAX,LS)	V1010170
1018.	184	OMD(I,JS,KAX,LS) = -(FXW(I,JS,KAX,LS)*SRAD(I,JS,KAX,LS) +	V1010180
1019.		1 T(I,JS,KAX,LS)) / WHEELI(I,JS,KAX,LS)	V1010190
1020.	185	XMUX(I,JS,KAX,LS) = FXW(I,JS,KAX,LS) / N(I,JS,KAX,LS)	V1010200
1021.	186	YMUY(I,JS,KAX,LS) = FYW(I,JS,KAX,LS) / N(I,JS,KAX,LS)	V1010210
1022.	187	350 CONTINUE	V1010220
1023.	188	360 CONTINUE	V1010230
1024.		C	V1010240
1025.		C UPDATE TRANSFORMATIONS	V1010250
1026.		C	V1010260
1027.	189	XROAD = XBAR(I,1)	V1010270

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   MTS          INTERNAL        ****  F I N I T I D Y ****
LINE NO.        STMT NO.        INPUT LISTING

1029.             190           DO 400 J = 1, MVEH                                                    V1010280
1029.             191             CPSI(J) = COS(PHIBAR(J,3))                                          V1010290
1030.             192             SPSI(J) = SIN(PHIBAR(J,3))                                          V1010300
1031.             193             A(J,1,1) = CPSI(J) * COS(PHIBAR(J,2))                               V1010310
1032.             194             A(J,2,1) = -SPSI(J) + PHIBAR(J,1) * CPSI(J) * PHIBAR(J,2)           V1010320
1033.             195             A(J,3,1) = SPSI(J) * PHIBAR(J,1) + CPSI(J) * PHIBAR(J,2)            V1010330
1034.             196             A(J,1,2) = SPSI(J) * COS(PHIBAR(J,2))                               V1010340
1035.             197             A(J,2,2) = CPSI(J) + PHIBAR(J,1) * SPSI(J) * PHIBAR(J,2)            V1010350
1036.             198             A(J,3,2) = -CPSI(J) * PHIBAR(J,1) + SPSI(J) * PHIBAR(J,2)           V1010360
1037.             199             A(J,1,3) = -PHIBAR(J,2)                                             V1010370
1038.             200             A(J,2,3) = PHIBAR(J,1)                                              V1010380
1039.             201             A(J,3,3) = COS(PHIBAR(J,2)) * COS(PHIBAR(J,1))                      V1010390
1040.             202             IF (IROAD .EQ. 0) GO TO 390                                         V1010400
1041.             203             IF (IROAD .LE. 0) GO TO 370                                         V1010410
1042.             204             DZDX = DZDX0                                                        V1010420
1043.             205             DZDY = DZDY0                                                        V1010430
1044.             206             GO TO 380                                                           V1010440
1045.             207      370    XROAD = XBAR(J,2)                                                   V1010450
1046.             208             IF (J .GT. 1) XROAD = XROAD - XBACK(J - 1) * CPSI(J - 1) - TCL(     V1010460
1047.                           1   J) * COS(PSIDCL(J)) - XFRONT(J) * CPSI(J)                         V1010470
1048.             209             CALL ROADDZ(XROAD, YROAD, DZDX, DZDY)                               V1010480
1049.             210      380    DZDX = CPSI(J) * DZDX + SPSI(J) * DZDY                              V1010490
1050.             211             DZDY = -SPSI(J) * DZDX + CPSI(J) * DZDY                             V1010500
1051.             212      390    BZ(J,2,1) = PHIBAR(J,1) * (PHIBAR(J,2) + DZDX)                      V1010510
1052.             213             BZ(J,1,2) = -(DZDX + PHIBAR(J,2)) * DZDY                            V1010520
1053.             214             BZ(J,3,1) = PHIBAR(J,2) + DZDX                                      V1010530
1054.             215             BZ(J,3,2) = -PHIBAR(J,1) + DZDY                                     V1010540
1055.             216             BZ(J,1,3) = -PHIBAR(J,2) - DZDX                                     V1010550
1056.             217             BZ(J,2,3) = PHIBAR(J,1) - DZDY                                      V1010560
1057.             218      400 CONTINUE                                                               V1010570
1058.                         C                                                                      V1010580
1059.                         C   UPDATE STEER ANGLE OF FRONT TRACTOR TIRES                           V1010590
1060.                         C                                                                      V1010600
1061.             219             IF (ISTEER .LT. 0) GO TO 410                                        V1010610
1062.             220             CALL TABLE(NOTURN(1,1), NOTURN(1,2), TURNX, TURNY, X,               V1010620
1063.                           1     DELT(1,1,1,1))                                                V1010630
1064.             221             CALL TABLE(NOTURN(2,1), NOTURN(2,2), TURNX, TURNY, X,               V1010640
1065.                           1     DELT(1,1,1,2))                                                V1010650
1066.             222             GO TO 420                                                           V1010660
1067.             223      410 YDR(1) = Y(2)                                                          V1010670
1068.             224             YDR(2) = Y(3)                                                       V1010680
1069.             225             YDR(3) = Y(12)                                                      V1010690
1070.             226             YDR(4) = Y(6)                                                       V1010700
1071.             227             YDR(5) = Y(1)                                                       V1010710
1072.             228             CALL DRIVER(X, YDR, DEW)                                            V1010720
1073.             229             DELT(1,1,1,1) = DEW                                                 V1010730
1074.             230             DELT(1,1,1,2) = DEW                                                 V1010740
1075.             231      420 CONTINUE                                                               V1010750
1076.                         C                                                                      V1010760
1077.                         C   SET UP OUTPUT BUFFER                                               V1010770
1078.                         C                                                                      V1010780
1079.             232             IF (Y(7) .LT. 0.) GO TO 430                                         V1010790
1080.             233             IF (X .LT. STEP) RETURN                                             V1010800
1081.             234             STEP = STEP + TINC                                                  V1010810
1082.             235      430 LINE = LINE + 1                                                        V1010820
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MTS LINE NO.	INTERNAL STMT NO.	**** F T N T I D Y **** INPUT LISTING	
1083.	236	DO 440 I = 1, MVEH	V1010830
1084.	237	DO 440 J = 1, 19	V1010840
1085.	238	440 OUT(I,J,1,LINE) = X	V1010850
1086.		C	V1010860
1087.		C POSITIONS, VELOCITY AND ACCELERATION PAGES	V1010870
1088.		C	V1010880
1089.	239	XROAD = XBAR(1,1)	V1010890
1090.	240	DO 460 I = 1, MVEH	V1010900
1091.	241	IF (I .GT. 1) XROAD = XROAD - XBACK(I - 1) * CPSI(I - 1) - TCL(	V1010910
1092.		1 I) * COS(PSIDOL(I)) - XFRONT(I) * CPSI(I)	V1010920
1093.	242	DO 460 J = 1, 6	V1010930
1094.	243	IV = (I - 1) * 28 + J	V1010940
1095.	244	JJ = J + 6	V1010950
1096.	245	IVV = (I - 1) * 28 + JJ	V1010960
1097.	246	OUT(I,1,J + 1,LINE) = Y(IV)	V1010970
1098.	247	OUT(I,2,J + 1,LINE) = Y(IVV)	V1010980
1099.	248	OUT(I,3,J + 1,LINE) = DERY(IVV)	V1010990
1100.	249	IF (J .LE. 3) GO TO 450	V1011000
1101.	250	OUT(I,1,J + 1,LINE) = OUT(I,1,J + 1,LINE) * RADIAN	V1011010
1102.	251	OUT(I,2,J + 1,LINE) = OUT(I,2,J + 1,LINE) * RADIAN	V1011020
1103.	252	OUT(I,3,J + 1,LINE) = OUT(I,3,J + 1,LINE) * RADIAN	V1011030
1104.	253	450 CONTINUE	V1011040
1105.	254	OUT(I,1,2,LINE) = XROAD	V1011050
1106.	255	OUT(I,1,8,LINE) = TRAD(I)	V1011060
1107.	256	OUT(I,1,9,LINE) = SSLIP(I) * RADIAN	V1011070
1108.	257	IF (I .GT. 1) OUT(I,1,10,LINE) = GAM(I)	V1011080
1109.	258	IF (I .GT. 1) OUT(I,2,8,LINE) = GAMD(I)	V1011090
1110.	259	OUT(I,3,8,LINE) = ACLONG(I)	V1011100
1111.	260	OUT(I,3,9,LINE) = ACLAT(I)	V1011110
1112.	261	460 CONTINUE	V1011120
1113.		C	V1011130
1114.		C AXLE PAGES	V1011140
1115.		C	V1011150
1116.	262	DO 490 I = 1, MVEH	V1011160
1117.	263	DO 490 JS = 1, 2	V1011170
1118.	264	IF (I .EQ. 2 .AND. JS .EQ. 1) GO TO 490	V1011180
1119.	265	JKK = 1	V1011190
1120.	266	IF (KEY(I,JS) .GT. 0) JKK = 2	V1011200
1121.	267	DO 480 KAX = 1, JKK	V1011210
1122.	268	INC = 2	V1011220
1123.	269	IF (JS .EQ. 2) INC = 3	V1011230
1124.	270	INC = INC + JS + KAX	V1011240
1125.	271	DO 470 LS = 1, 2	V1011250
1126.	272	IC = (LS - 1) * 5	V1011260
1127.	273	OUT(I,INC,2 + IC,LINE) = N(I,JS,KAX,LS)	V1011270
1128.	274	OUT(I,INC,3 + IC,LINE) = FXW(I,JS,KAX,LS)	V1011280
1129.	275	OUT(I,INC,4 + IC,LINE) = FYW(I,JS,KAX,LS)	V1011290
1130.	276	OUT(I,INC,5 + IC,LINE) = XMUX(I,JS,KAX,LS)	V1011300
1131.	277	OUT(I,INC,6 + IC,LINE) = YMUY(I,JS,KAX,LS)	V1011310
1132.	278	IF (I .EQ. 1 .AND. JS .EQ. 1) OUT(I,INC,12,LINE) = (DELT(	V1011320
1133.		1 I,JS,KAX,1) + PST(I,JS,KAX)*(PHIBAR(I,1) - THETAX(I,JS,	V1011330
1134.		2 KAX))) * RADIAN	V1011340
1135.	279	IF (I .EQ. 1 .AND. JS .EQ. 1) OUT(I,INC,13,LINE) = (DELT(	V1011350
1136.		1 I,JS,KAX,2) + PST(I,JS,KAX)*(PHIBAR(I,1) - THETAX(I,JS,	V1011360
1137.		2 KAX))) * RADIAN	V1011370

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   MTS          INTERNAL       **** F T N T I D Y ****
LINE NO.        STMT NO.       INPUT LISTING

1139.             299       470       CONTINUE                                                                  V1C11380
1139.             291       480     CONTINUE                                                                    V1011390
1140.             292       490 CONTINUE                                                                        V1C11400
1141.                       C                                                                                   V1011410
1142.                       C   BRAKE PAGES                                                                     V1011420
1143.                       C                                                                                   V1011430
1144.             293           DO 520 I = 1, MVEH                                                              V1011440
1145.             294             DO 520 JS = 1, 2                                                              V1011450
1146.             295               IF (I .EQ. 2 .AND. JS .EQ. 1) GO TO 520                                     V1011460
1147.             296               JKK = 1                                                                     V1011470
1148.             297               IF (KEY(I,JS) .GT. 0) JKK = 2                                               V1011480
1149.             298               DO 510 KAX = 1, JKK                                                         V1011490
1150.             299                 INC = 6                                                                   V1011500
1151.             300                 IF (JS .EQ. 2) INC = 7                                                    V1C11510
1152.             301                 INC = INC + JS + KAX                                                      V1011520
1153.             302                 DO 500 LS = 1, 2                                                          V1011530
1154.             303                   IC = (LS - 1) * 6                                                       V1011540
1155.             304                   IIJ = NTP(I,2)                                                          V1011550
1156.             305                   CALL TAPLE(I, IIJ, XTP, YTP, X, PTRDD)                                  V1011560
1157.             306                   OUT(I,INC,2,LINE) = PTRDD                                               V1011570
1158.             307                   OUT(I,INC,3 + IC,LINE) = P(I,JS,KAX,LS)                                 V1011580
1159.             308                   OUT(I,INC,4 + IC,LINE) = T(I,JS,KAX,LS) * 12.                           V1011590
1160.             309                   OUT(I,INC,5 + IC,LINE) = FXW(I,JS,KAX,LS)                               V1011600
1161.             310                   OUT(I,INC,6 + IC,LINE) = SLIP(I,JS,KAX,LS)                              V1011610
1162.             311                   OUT(I,INC,7 + IC,LINE) = UM(I,JS,KAX,LS)                                V1011620
1163.             312                   OUT(I,INC,8 + IC,LINE) = OMD(I,JS,KAX,LS)                               V1011630
1164.             313       500         CONTINUE                                                                V1011640
1165.             314       510       CONTINUE                                                                  V1011650
1166.             315       520 CONTINUE                                                                        V1011660
1167.                       C                                                                                   V1011670
1168.                       C   LATERAL PAGE                                                                    V1C11680
1169.                       C                                                                                   V1011690
1170.             316           DO 550 I = 1, MVEH                                                              V1011700
1171.             317             DO 550 JS = 1, 2                                                              V1011710
1172.             318               IF (I .EQ. 2 .AND. JS .EQ. 1) GO TO 550                                     V1011720
1173.             319               JKK = 1                                                                     V1011730
1174.             320               IF (KEY(I,JS) .GT. 0) JKK = 2                                               V1011740
1175.             321               DO 540 KAX = 1, JKK                                                         V1011750
1176.             322                 INC = 10                                                                  V1011760
1177.             323                 IF (JS .EQ. 2) INC = 11                                                   V1011770
1178.             324                 INC = INC + JS + KAX                                                      V1011780
1179.             325                 DO 530 LS = 1, 2                                                          V1011790
1180.             326                   IC = (LS - 1) * 4                                                       V1011800
1181.             327                   OUT(I,INC,2 + IC,LINE) = ALPPM(I,JS,KAX,LS) * RADIAN                    V1011810
1182.             328                   OUT(I,INC,3 + IC,LINE) = FYW(I,JS,KAX,LS)                               V1C11820
1183.             329                   OUT(I,INC,4 + IC,LINE) = YMUY(I,JS,KAX,LS)                              V1011830
1184.             330                   OUT(I,INC,5 + IC,LINE) = TALIGN(I,JS,KAX,LS) * 12.                      V1011840
1185.             331       530         CONTINUE                                                                V1011850
1186.             332       540       CONTINUE                                                                  V1011860
1187.             333       550 CONTINUE                                                                        V1011870
1188.                       C                                                                                   V1011880
1189.                       C   UNSPRUNG MASS PAGES                                                            V1011890
1190.                       C                                                                                   V1011900
1191.             334           DO 570 I = 1, MVEH                                                              V1011910
1192.             335             DO 570 JS = 1, 2                                                              V1011920
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   MTS          INTERNAL       **** F I N T I D Y ****
LINE NO.        STMT NO.       INPUT LISTING

1193.             326              IF (I .EQ. 2 .AND. JS .EQ. 1) GO TO 570                                  V1011930
1194.             327              JKK = 1                                                                  V1011940
1195.             328              IF (KEY(I,JS) .GT. 0) JKK = 2                                            V1011950
1196.             329              DO 560 KAX = 1, JKK                                                      V1011960
1197.             330                INC = 14                                                               V1011970
1198.             331                IF (JS .EQ. 2) INC = 15                                                V1011980
1199.             332                INC = JS + KAX + INC                                                   V1011990
1200.             333                OUT(I,INC,2,LINE) = ZAXLE(I,JS,KAX)                                   V1012000
1201.             334                OUT(I,INC,3,LINE) = THETAX(I,JS,KAX) * RADIAN                          V1012010
1202.             335                OUT(I,INC,4,LINE) = DZAXLE(I,JS,KAX)                                   V1012020
1203.             336                OUT(I,INC,5,LINE) = DTHAX(I,JS,KAX) * RADIAN                           V1012030
1204.             337                OUT(I,INC,6,LINE) = AUXROL(I,JS,KAX) * 12.                             V1012040
1205.             338                OUT(I,INC,7,LINE) = S(I,JS,KAX,1) * 12.                                V1012050
1206.             339                OUT(I,INC,8,LINE) = SD(I,JS,KAX,1) * 12.                               V1012060
1207.             340                OUT(I,INC,9,LINE) = SE(I,JS,KAX,1)                                     V1012070
1208.             341                OUT(I,INC,10,LINE) = S(I,JS,KAX,2) * 12.                               V1012080
1209.             342                OUT(I,INC,11,LINE) = SD(I,JS,KAX,2) * 12.                              V1012090
1210.             343                OUT(I,INC,12,LINE) = SE(I,JS,KAX,2)                                    V1012100
1211.             344           560  CONTINUE                                                               V1012110
1212.             345           570 CONTINUE                                                                V1012120
1213.                       C                                                                              V1012130
1214.                       C   BUFFER IS COMPLETE                                                         V1012140
1215.                       C                                                                              V1012150
1216.                       C   IF VELOCITY IS GREATER THAN 0. AND LINE IS LESS THAN 41,RETURN             V1012160
1217.                       C   TO ECT, OTHERWISE DUMP THE BUFFER                                          V1012170
1218.                       C                                                                              V1012180
1219.             346           IF (Y(7) .LT. 0.0001) GO TO 580                                            V1012190
1220.             347           IF (LINE .LT. 41) RETURN                                                   V1012200
1221.             348           GO TO 590                                                                  V1012210
1222.             349           ENTRY OUTP1                                                                V1012220
1223.             350        580 PRM1(5) = 1.0                                                             V1012230
1224.             351        590 DO 790 I = 1, MVEH                                                        V1012240
1225.             352              SPAGE = PAGE                                                           V1012250
1226.             353              DO 790 J = 1, 19                                                       V1012260
1227.             354                IF (IPR(I,J) .EQ. 0) GO TO 790                                       V1012270
1228.             355                WRITE (W,900) SPAGE, I, HEAD                                         V1012280
1229.             356                GO TO (600, 620, 640, 650, 660, 670, 670, 680, 680, 680,             V1012290
1230.                            1     680, 690, 690, 690, 690, 700, 700, 700, 700), J                    V1012300
1231.                       C                                                                              V1012310
1232.                       C   PRINT POSITION PAGES                                                      V1012320
1233.                       C                                                                              V1012330
1234.             357        600       IF (I .EQ. 1) GO TO 610                                            V1012340
1235.             358                  II = I - 1                                                         V1012350
1236.             359                  WRITE (W,810) II                                                   V1012360
1237.             360                  GO TO 740                                                          V1012370
1238.             361        610       IF (MVEH .GT. 1) IV = 1                                            V1012380
1239.             362                  IF (MVEH .EQ. 1) IV = 3                                            V1012390
1240.             363                  WRITE (W,820) (VEH(IJ,IV),IJ=1,2)                                  V1012400
1241.             364                  GO TO 730                                                          V1012410
1242.                       C                                                                              V1012420
1243.                       C   PRINT VELOCITY PAGE                                                      V1012430
1244.                       C                                                                              V1012440
1245.             365        620       IF (I .EQ. 1) GO TO 630                                            V1012450
1246.             366                  II = I - 1                                                         V1012460
1247.             367                  WRITE (W,830) II                                                   V1012470
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MTS LINE NO.	INTERNAL STMT NO.	**** P R I N T E D Y **** INPUT LISTING	
1248.	368	GO TO 720	V1012480
1249.	369	630 IF (MVEH .GT. 1) IV = 1	V1012490
1250.	370	IF (MVEH .EQ. 1) IV = 2	V1012500
1251.	371	WRITE (W,840) (VEH(IJ,IV),IJ=1,2)	V1012510
1252.	372	GO TO 710	V1012520
1253.		C	V1012530
1254.		C PRINT ACCELERATION PAGES	V1012540
1255.		C	V1012550
1256.	373	640 IT = I - 1	V1012560
1257.	374	IV = 1	V1012570
1258.	375	IF (I .GT. 1) IV = 2	V1012580
1259.	376	IF (MVEH .EQ. 1) IV = 3	V1012590
1260.	377	IF (I .EQ. 1) WRITE (W,850) (VEH(IJ,IV),IJ=1,2)	V1012600
1261.	378	IF (I .GT. 1) WRITE (W,860) (VEH(IJ,IV),IJ=1,2), IT	V1012610
1262.	379	WRITE (W,870)	V1012620
1263.	380	GO TO 730	V1012630
1264.		C	V1012640
1265.		C FRONT AXLE PAGES	V1012650
1266.		C	V1012660
1267.	381	650 IF (I .EQ. 1 .AND. J .EQ. 4) GO TO 660	V1012670
1268.	382	WRITE (W,880) IT	V1012680
1269.	383	IF (KEY(I,1) .GT. 0) WRITE (W,890) (AXLE(IJ,J - 3),IJ=1,3)	V1012690
1270.	384	WRITE (W,930)	V1012700
1271.	385	GO TO 750	V1012710
1272.	386	660 IV = I	V1012720
1273.	387	IF (MVEH .EQ. 1) IV = 3	V1012730
1274.	388	WRITE (W,900) (VEH(IJ,IV),IJ=1,2)	V1012740
1275.	389	GO TO 770	V1012750
1276.		C	V1012760
1277.		C REAR AXLE PAGES	V1012770
1278.		C	V1012780
1279.	390	670 IV = 1	V1012790
1280.	391	IF (I .GT. 1) IV = 2	V1012800
1281.	392	IF (MVEH .EQ. 1) IV = 3	V1012810
1282.	393	IT = I - 1	V1012820
1283.	394	IF (I .EQ. 1) WRITE (W,910) (VEH(IJ,IV),IJ=1,2)	V1012830
1284.	395	IF (I .GT. 1) WRITE (W,920) (VEH(IJ,IV),IJ=1,2), IT	V1012840
1285.	396	IF (KEY(I,2) .GT. 0) WRITE (W,890) (AXLE(IJ,J - 5),IJ=1,3)	V1012850
1286.	397	WRITE (W,930)	V1012860
1287.	398	GO TO 750	V1012870
1288.		C	V1012880
1289.		C BRAKE PAGES	V1012890
1290.		C	V1012900
1291.	399	680 IV = 1	V1012910
1292.	400	IF (I .GT. 1) IV = 2	V1012920
1293.	401	IF (MVEH .EQ. 1) IV = 3	V1012930
1294.	402	IT = I - 1	V1012940
1295.	403	IFR = 1	V1012950
1296.	404	IF ((J - 7) .GT. 2) IFR = 2	V1012960
1297.	405	LT = 1	V1012970
1298.	406	IF (J/2*2 .NE. J) LT = 2	V1012980
1299.	407	IF (I .EQ. 1) WRITE (W,940) (VEH(IJ,IV),IJ=1,2),	V1012990
1300.		1 (FR(IJ,IFR),IJ=1,4)	V1013000
1301.	408	IF (I .GT. 1) WRITE (W,950) (VEH(IJ,IV),IJ=1,2), IT,	V1013010
1302.		1 (FR(IJ,IFR),IJ=1,4)	V1013020

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 MTS          INTERNAL       **** F I N T I D Y ****
LINE NO.      STMT NO.       INPUT LISTING

1303.           409              IF (KEY(I,IER) .GT. 0) WRITE (W,893) (AXLE(IJ,LT),IJ=1,3)      V1013030
1304.           410              WRITE (W,960)                                                  V1013040
1305.           411              GO TO 780                                                      V1013050
1306.                      C                                                                    V1013060
1307.                      C   LATERAL PAGES                                                    V1013070
1308.                      C                                                                    V1013080
1309.           412        650   IV = 1                                                         V1013090
1310.           413              IF (I .GT. 1) IV = 2                                           V1013100
1311.           414              IF (MVEH .EQ. 1) IV = 3                                        V1013110
1312.           415              IT = I - 1                                                     V1013120
1313.           416              IER = 1                                                        V1013130
1314.           417              IF ((J - 11) .GT. 2) IER = 2                                   V1013140
1315.           418              LT = 1                                                         V1013150
1316.           419              IF (J/2*2 .NE. J) LT = 2                                       V1013160
1317.           420              IF (I .EQ. 1) WRITE (W,970) (VEH(IJ,IV),IJ=1,2),               V1013170
1318.                         1   (FP(IJ,IER),IJ=1,4)                                         V1013180
1319.           421              IF (I .GT. 1) WRITE (W,980) (VEH(IJ,IV),IJ=1,2), IT,           V1013190
1320.                         1   (FR(IJ,IER),IJ=1,4)                                         V1013200
1321.           422              IF (KEY(I,IER) .GT. 0) WRITE (W,890) (AXLE(IJ,LT),IJ=1,3)      V1013210
1322.           423              WRITE (W,990)                                                  V1013220
1323.           424              GO TO 730                                                      V1013230
1324.                      C                                                                    V1013240
1325.                      C   UNSPRUNG MASS PAGES                                            V1013250
1326.                      C                                                                    V1013260
1327.           425        700   IV = 1                                                         V1013270
1328.           426              IF (I .GT. 1) IV = 2                                           V1013280
1329.           427              IF (MVEH .EQ. 1) IV = 3                                        V1013290
1330.           428              IT = I - 1                                                     V1013300
1331.           429              LT = 1                                                         V1013310
1332.           430              IF (J/2*2 .NE. J) LT = 2                                       V1013320
1333.           431              IER = 1                                                        V1013330
1334.           432              IF ((J - 15) .GT. 2) IER = 2                                   V1013340
1335.           433              IF (I .EQ. 1) WRITE (W,1000) (VEH(IJ,IV),IJ=1,2),              V1013350
1336.                         1   (FP(IJ,IER),IJ=1,4)                                         V1013360
1337.           434              IF (I .GT. 1) WRITE (W,1010) (VEH(IJ,IV),IJ=1,2), IT,          V1013370
1338.                         1   (FR(IJ,IER),IJ=1,4)                                         V1013380
1339.           435              IF (KEY(I,IER) .GT. 0) WRITE (W,890) (AXLE(IJ,LT),IJ=1,3)      V1013390
1340.           436              WRITE (W,1020)                                                 V1013400
1341.           437              GO TO 760                                                      V1013410
1342.           438        710   WRITE (W,1030) ((OUT(I,J,ICOL,ILINE),ICOL=1,7),ILINE=1,LINE)  V1013420
1343.           439              GO TO 790                                                      V1013430
1344.           440        720   WRITE (W,1040) ((OUT(I,J,ICOL,ILINE),ICOL=1,8),ILINE=1,LINE)  V1013440
1345.           441              GO TO 790                                                      V1013450
1346.           442        730   WRITE (W,1050) ((OUT(I,J,ICOL,ILINE),ICOL=1,9),ILINE=1,LINE)  V1013460
1347.           443              GO TO 790                                                      V1013470
1348.           444        740   WRITE (W,1060) ((OUT(I,J,ICOL,ILINE),ICOL=1,10),ILINE=1,LINE) V1013480
1349.           445              GO TO 790                                                      V1013490
1350.           446        750   WRITE (W,1070) ((OUT(I,J,ICOL,ILINE),ICOL=1,11),ILINE=1,LINE) V1013500
1351.           447              GO TO 790                                                      V1013510
1352.           448        760   WRITE (W,1080) ((OUT(I,J,ICOL,ILINE),ICOL=1,12),ILINE=1,LINE) V1013520
1353.           449              GO TO 790                                                      V1013530
1354.           450        770   WRITE (W,1090) ((OUT(I,J,ICOL,ILINE),ICOL=1,13),ILINE=1,LINE) V1013540
1355.           451              GO TO 790                                                      V1013550
1356.           452        780   WRITE (W,1099) ((OUT(I,J,ICOL,ILINE),ICOL=1,14),ILINE=1,LINE) V1013560
1357.           453              GO TO 790                                                      V1013570
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   MTS          INTERNAL       **** F I N T I C Y ****
LINE NO.        STMT NO.       INPUT LISTING

1358.                     C                                                                    V1013580
1359.              454          790 SPACE = SPACE + .01                                         V1013590
1360.              455              PAGE = PAGE + 1.                                            V1013600
1361.              456              LINE = 0                                                    V1013610
1362.              457              RETURN                                                      V1013620
1363.                     C                                                                    V1013630
1364.                     C   FORMATS                                                          V1013640
1365.                     C                                                                    V1013650
1366.              458          800 FORMAT ('1', T36, 'HSRI TRUCK AND TRACTOR-TRAILER DYNAMIC RESPONSEV1013660
1367.                         1', ' SIMULATION - T3DRS,V1', T110, 'OUTPUT PAGE NO.', F6.2, '.',    V1013670
1368.                         2       T11//T36, 20A4///)                                       V1013680
1369.              459          810 FORMAT (T48, 'TRAILER NO.', I2, ' SPRUNG MASS POSITION'/14X,     V1013690
1370.                         1       '-------------------------------------------------------V1013700
1371.                         2--', '-----------------------------'/5X, 'TIME', T16, 'FORWARD',     V1013710
1372.                         3       T28, 'LATERAL', T39, 'VERTICAL', T53, 'ROLL', T64, 'PITCH',V1013720
1373.                         4       T75, 'HEADING', T88, 'TURN', T100, 'SIDE', T113,             V1013730
1374.                         5       'ARTICULATION'/5X, '(SEC)', T17, '(FT)', T29, '(FT)', T41, V1013740
1375.                         6       '(FT)', T53, '(DEG)', T65, '(DEG)', T77, '(DEG)', T87,       V1013750
1376.                         7       'RADIUS', T100, 'SLIP', T110, 'ANGLE (DEG)'/T88, '(FT)',     V1013760
1377.                         8       T100, '(DEG)'/)                                          V1013770
1378.              460          820 FORMAT (T48, 2A4, ' SPRUNG MASS POSITION'/14X,                 V1013780
1379.                         1       '--------------------', '-------------------------------V1013790
1380.                         2----------------------', '---------'/5X, 'TIME', T16,              V1013800
1381.                         3       'FORWARD', T31, 'LATERAL', T45, 'VERTICAL', T62, 'ROLL',     V1013810
1382.                         4       T77, 'PITCH', T90, 'HEADING', T110, 'TURN', T126,            V1013820
1383.                         5       'SIDE'/5X, '(SEC)', T17, '(FT)', T32, '(FT)', T47, '(FT)', V1013830
1384.                         6       T62, '(DEG)', T77, '(DEG)', T91, '(DEG)', T110, 'RADIUS',    V1013840
1385.                         7       T126, 'SLIP'/T111, '(FT)', T126, '(DEG)'/)                   V1013850
1386.              461          830 FORMAT (T43, 'TRAILER NO.', I2, ' SPRUNG MASS VELOCITY (BODY AXES)V1013860
1387.                         1'/12X, 'TIME', T25, '-----------------------------------------',    V1013870
1388.                         2       '-----------------------------------------'/12X,V1013880
1389.                         3       '(SEC)', T26, 'FORWARD', T40, 'LATERAL', T55, 'VERTICAL',    V1013890
1390.                         4       T74, 'ROLL', T88, 'PITCH', T100, 'HEADING', T115,            V1013900
1391.                         5       'ARTICULATION'/T26, '(FT/SEC)', T40, '(FT/SEC)', T55,        V1013910
1392.                         6       '(FT/SEC)', T71, '(DEG/SEC)', T86, '(DEG/SEC)', T100,       V1013920
1393.                         7       '(DEG/SEC)', T115, 'RATE (DEG/SEC)'/)                        V1013930
1394.              462          840 FORMAT (T43, 2A4, ' SPRUNG MASS VELOCITY (BODY AXES)'/12X, 'TIME',V1013940
1395.                         1       T25, '-----------------------------------------',           V1013950
1396.                         2       '-----------------------------------'/12X, '(SEC)',         V1013960
1397.                         3       T26, 'FORWARD', T40, 'LATERAL', T55, 'VERTICAL', T74,        V1013970
1398.                         4       'ROLL', T87, 'PITCH', T101, 'HEADING'/T26, '(FT/SEC)', T40,V1013980
1399.                         5       '(FT/SEC)', T55, '(FT/SEC)', T71, '(DEG/SEC)', T85,         V1013990
1400.                         6       '(DEG/SEC)', T100, '(DEG/SEC)'//)                            V1014000
1401.              463          850 FORMAT (T43, 2A4, ' SPRUNG MASS ACCELERATION (BODY AXES)', T100,  V1014010
1402.                         1       'INERTIAL ACCEL. ALONG BODY AXES'/)                          V1014020
1403.              464          860 FORMAT (T43, 2A4, ' NO.', I2, ' SPRUNG MASS ACCELERATION (BODY AXEV1014030
1404.                         1S)', T100, 'INERTIAL ACCEL. ALONG BODY AXES'/)                      V1014040
1405.              465          870 FORMAT (5X, 'TIME', T16, '-------------------------------------V1014050
1406.                         1', '-----------------------------------', T100,                    V1014060
1407.                         2       '----------', '--------------------'/5X, '(SEC)', T16,       V1014070
1408.                         3       'FORWARD', T31, 'LATERAL', T45, 'VERTICAL', T63, 'ROLL',     V1014080
1409.                         4       T77, 'PITCH', T88, 'HEADING', T102, 'LONGITUDINAL', T125,    V1014090
1410.                         5       'LATERAL'/T14, '(FT/SEC**2)', T29, '(FT/SEC**2)', T43,       V1014100
1411.                         6       '(FT/SEC**2)', T59, '(DEG/SEC**2)', T73, '(DEG/SEC**2)',     V1014110
1412.                         7       T86, '(DEG/SEC**2)', T100, '(FT/SEC**2)', T123,              V1014120
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   MTS          INTERNAL      **** F T N T I D Y ****
LINE NO.        STMT NO.      INPUT LISTING

1413.                            8       '(FT/SEC**2)'/)                                                    V1014130
1414.                  466   880 FORMAT (T50, 'TRAILER NO.', I2, ' FRONT AXLE TIRE FORCES'/)                V1014140
1415.                  467   890 FORMAT (T56, 3A8/)                                                         V1014150
1416.                  468   900 FORMAT (T50, 2A4, ' FRONT AXLE TIRE FORCES'/T26, 'LEFT SIDE', T76,         V1014160
1417.                            1       'RIGHT SIDE', T118, 'STEER ANGLE'/T13,                             V1014170
1418.                            2       '--------------------', '--------------------------', T65,       V1014180
1419.                            3       '--------------------------', '--------------------', T115,      V1014190
1420.                            4       '--------------------'/5X, 'TIME', T13, 'VERTICAL', T25,           V1014200
1421.                            5       'LONG.', T34, 'LATERAL', T46, 'ML-X', T54, 'MU-Y', T64,            V1014210
1422.                            6       'VERTICAL', T75, 'LONG.', T84, 'LATERAL', T95, 'MU-X',             V1014220
1423.                            7       T105, 'ML-Y', T116, 'LEFT', T125, 'RIGHT'/5X, '(SEC)', T15,        V1014230
1424.                            8       '(LB)', T25, '(LB)', T36, '(LB)', T66, '(LB)', T75, '(LB)',        V1014240
1425.                            9       T86, '(LB)', T116, '(DEG)', T125, '(DEG)'/)                        V1014250
1426.                  469   910 FORMAT (T50, 2A4, ' REAR SUSPENSION TIRE FORCES'/)                         V1014260
1427.                  470   920 FORMAT (T50, 2A4, ' NO.', I2, ' REAR SUSPENSION TIRE FORCES'/)             V1014270
1428.                  471   930 FORMAT (T26, 'LEFT SIDE', T99, 'RIGHT SIDE'/T15,                           V1014280
1429.                            1       '----------', '------------------------------',                    V1014290
1430.                            2       T75, '--------------------', '------------------------------V1014300
1431.                            3', /, 5X, 'TIME', T15, 'VERTICAL', T28, 'LONG.', T38, 'LATERAL',           V1014310
1432.                            4       T51, 'MU-X', T61, 'MU-Y', T75, 'VERTICAL', T87, 'LONG.',           V1014320
1433.                            5       T97, 'LATERAL', T109, 'MU-X', T120, 'ML-Y'/5X, '(SEC)',            V1014330
1434.                            6       T17, '(LB)', T28, '(LB)', T40, '(LB)', T77, '(LB)', T87,           V1014340
1435.                            7       '(LB)', T99, '(LB)'/)                                              V1014350
1436.                  472   940 FORMAT (T45, 2A4, 1X, 4A4, ' - BRAKE SUMMARY'/)                           V1014360
1437.                  473   950 FORMAT (T45, 2A4, ' NO.', I2, 1X, 4A4, ' - BRAKE SUMMARY'/)                V1014370
1438.                  474   960 FORMAT ('0', T47, 'LEFT SIDE', T104, 'RIGHT SIDE'/T24,                     V1014380
1439.                            1       '----------', '--------------------------------------',           V1014390
1440.                            2       T78, '----------', '--------------------------------------V1014400
1441.                            3----'/4X, 'TIME', 6X, 'TREADLE', 3X, 'BRAKE', T34, 'BRAKE', T45,          V1014410
1442.                            4       'TIRE', T52, 'WHEEL', 3X, 'ANGULAR', 3X, 'ANGULAR', T78,           V1014420
1443.                            5       'BRAKE', T88, 'BRAKE', T100, 'TIRE', T107, 'WHEEL', 4X,            V1014430
1444.                            6       'ANGULAR', 3X, 'ANGULAR', /, 4X, '(SEC)', 5X, 'PRESSURE',          V1014440
1445.                            7       2X, 'PRESSURE', T34, 'TORQUE', T45, 'BRAKE', T52, 'SLIP',          V1014450
1446.                            8       4X, 'WHEEL', 5X, 'WHEEL', T78, 'PRESSURE', T88, 'TORQUE',          V1014460
1447.                            9       T100, 'BRAKE', T107, 'SLIP', 5X, 'WHEEL', 5X, 'WHEEL'/T16,         V1014470
1448.                            *       '(PSI)', 5X, '(PSI)', T34, '(IN-LB)', T45, 'FORCE', T60,           V1014480
1449.                            1       'VEL.', 6X, 'ACCEL.', T79, '(PSI)', T88, '(IN-LB)', T100,          V1014490
1450.                            2       'FORCE', T116, 'VEL', 7X, 'ACCEL.'/T46, '(LB)', T59,               V1014500
1451.                            3       '(RAD/SEC)', '(RAD/S**2)', T101, '(LB)', T115, '(RAD/SEC)',        V1014510
1452.                            4       '(RAD/S**2)'/)                                                     V1014520
1453.                  475   970 FORMAT (T35, 2A4, 1X, 4A4, ' - LATERAL TIRE FORCE AND MOMENT SUMMAV1014530
1454.                            1PY'/)                                                                     V1014540
1455.                  476   980 FORMAT (T35, 2A4, ' NO.', I2, 1X, 4A4, ' - LATERAL TIRE FORCE AND'V1014550
1456.                            1       , ' MOMENT SUMMARY'/)                                              V1014560
1457.                  477   990 FORMAT (T38, 'LEFT SIDE', T100, 'RIGHT SIDE'/T16,                          V1014570
1458.                            1       '----------', '----------', '--------------------V1014580
1459.                            2-----', T75, '--------------------', '----------',                        V1014590
1460.                            3       '--------------------'/5X, 'TIME', T16, 'TIRE', T31,               V1014600
1461.                            4       'TIRE', T59, 'ALIGNING', T75, 'TIRE', T90, 'TIRE', T122,           V1014610
1462.                            5       'ALIGNING'/5X, '(SEC)', T16, 'SIDESLIP', T31, 'LATERAL',           V1014620
1463.                            6       T59, 'TORQUE', T47, 'MU-Y', T112, 'MU-Y', T75, 'SIDESLIP',         V1014630
1464.                            7       T90, 'LATERAL', T122, 'TORQUE'/T16, 'ANGLE', T31, 'FORCE',         V1014640
1465.                            8       T59, '(IN-LB)', T75, 'ANGLE', T90, 'FORCE', T122,                  V1014650
1466.                            9       '(IN-LB)'/T16, '(DEG)', T31, '(LB)', T75, '(DEG)', T90,            V1014660
1467.                            *       '(LB)'/)                                                           V1014670
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   MTS          INTERNAL       ****  F T N T I C Y ****
LINE NO.        STMT NO.       INPUT LISTING

1468.             478      1030 FORMAT (T45, 2A4, 1X, 4A4, ' - UNSPRUNG MASS SUMMARY'/)                  V1014680
1469.             479      1010 FORMAT (T45, 2A4, ' NO.', I2, 1X, 4A4, ' - UNSPRUNG MASS SUMMARY'/V1014690
1470.                         1        )                                                                  V1014700
1471.             480      1020 FORMAT (T26, 'AXLE MOTION', T71, 'DYNAMIC SUSPENSION MOTIONS AND 'V1014710
1472.                         1        , 'FORCES'/T26, '-----------', T71, '-----------------------V1014720
1473.                         2--------', '---------'/T19, 'POSITION', T38, 'VELOCITY', T70,        V1014730
1474.                         3        'LEFT SIDE', T100, 'RIGHT SIDE'/T12, '-----------------',  V1014740
1475.                         4        T35, '-----------------', T65, '-------------------------'V1014750
1476.                         5        , T95, '-------------------------'/5X, 'TIME', T13,        V1014760
1477.                         6        'VERTICAL', T26, 'ROLL', T35, 'VERTICAL', T46, 'ROLL', T53,V1014770
1478.                         7        'AUXILIARY', T65, 'SUSP.', T75, 'SUSP.', T85, 'SUSP.', T95,V1014780
1479.                         8        'SUSP.', T105, 'SUSP.', T115, 'SUSP.'/5X, '(SEC)', T15,    V1014790
1480.                         9        '(FT)', T25, '(DEG)', T35, '(FT/SEC)', T43, '(DEG/SEC)',   V1014800
1481.                         *        T53, 'ROLL TORQUE', T65, 'DEFLECT.', T75, 'VELOCITY', T85,  V1014810
1482.                         1        'FORCE', T95, 'DEFLECT.', T105, 'VELOCITY', T115,          V1014820
1483.                         2        'FORCE'/T53, '(IN-LB)', T65, '(IN)', T75, '(IN/SEC)', T85, V1014830
1484.                         3        '(LB)', T95, '(IN)', T105, '(IN/SEC)', T115, '(LB)'/)      V1014840
1485.             481      1030 FORMAT (11X, F6.2, 6F15.2)                                           V1014850
1486.             482      1040 FORMAT (11X, F6.2, 7F15.2)                                           V1014860
1487.             483      1050 FORMAT (4X, F6.2, 9F12.4)                                            V1014870
1488.             484      1060 FORMAT (4X, F6.2, 2X, F10.2, 1X, F10.2, 1X, F10.2, 1X, F10.4, 1X,  V1014880
1489.                         1        F10.4, 5X, F10.2, 1X, F10.2, 1X, F10.2, 1X, F10.4, 1X,     V1014890
1490.                         2        F10.4)                                                     V1014900
1491.             485      1070 FORMAT (4X, F6.2, 4F10.4, 1X, F10.1, 1X, F8.4, F10.4, 1X, F8.2,    V1014910
1492.                         1        1X, F10.4, F10.4, 1X, F8.2)                                V1014920
1493.             486      1080 FORMAT (4X, F6.2, 3F10.2, 2F10.4, 3F10.2, 2F10.4, 4X, F6.2, 4X,    V1014930
1494.                         1        F6.2)                                                      V1014940
1495.             487      1090 FORMAT (2X, F6.2, 4X, F8.2, F8.2, 1X, F10.2, 2X, F8.2, 2X, F6.4,   V1014950
1496.                         1        1X, F8.2, 1X, F8.2, F8.2, 1X, F10.2, 2X, F8.2, 2X, F6.4,   V1014960
1497.                         2        1X, F8.2, 1X, F8.2)                                        V1014970
1498.             488      1100 FORMAT (4X, F6.2, F12.4, 3X, F12.4, 3X, F12.4, 3X, F12.4, 3X,      V1014980
1499.                         1        F12.4, 3X, F12.4, 3X, 4X, F12.4, 3X, F12.4)                V1014990
1500.             489           END                                                                  V1015000
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*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES											
ABS	(R*4)	FCN	146	157										
ATAN	(R*4)	FCN	145											
COS	R*4	FCN	104	106	109	114	172	173	191	193	196	201	208	241
DRIVER		SUBR	229											
OUTP	(R*4)	ENTRY	1350											
OUTPUT		SUBR	10											
OUTP1	(R*4)	ENTRY	3460											
ROADDZ		SUBR	209											
SIN	(R*4)	FCN	105	172	173	192								
SQRT	(R*4)	FCN	158											
TABLE		SUBR	132	133	220	221	295							
<EXIT>		SUBR	134	233	347	457								

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES										
A	(R*4)	ARRAY	TRANS	21C	106*	107*	108*	109*	110*	111*	112*	113*	114*	193*	194*
				195*	196*	197*	198*	199*	200*	201*					
ACLAT	(R*4)	ARRAY		11C	141*	143	260								
ACLONG	(R*4)	ARRAY		11D	140*	142	259								
ADEN	(R*4)	ARRAY		11C	156*	157?	158								
ALEPPM	(R*4)	ARRAY	TIRES	31C	317										
APHI	(R*4)	ARRAY	SPMASS	20C											
ASM	(R*4)	ARRAY	UNSPM	19C											
ASW	(R*4)	ARRAY	UNSPM	19C											
AUXROL	(R*4)	ARRAY	UNSPM	19C	337										
AXDELT	(R*4)	ARRAY	UNSPM	19C											
AXLE	R*8	ARRAY		3D	340	38	383	396	409	422	435				
AI	(R*4)	ARRAY	CGLOC	22C	170	171									
A3	(R*4)	ARRAY	SPMASS	20C											
BB1	(R*4)	ARRAY	SPMASS	20C											
BETAD	(R*4)	ARRAY		11D	153*	156									
BTQ	(R*4)	ARRAY	BRAKE	27C											
BX	(R*4)	ARRAY	CGLOC	22C											
BZ	(R*4)	ARRAY	TRANS	21C	118*	120*	122*	123*	124*	125*	212*	213*	214*	215*	216*
				217*											
C	(R*4)	ARRAY	UNSPM	19C											
CALF	(R*4)	ARRAY	TIRES	31C											
CAT	(R*4)	ARRAY	TIRES	31C											
CF	(R*4)	ARRAY	UNSPM	19C											
CPSI	(R*4)	ARRAY	TRANS	21C	104*	106	107	108	110	111	191*	193	194	195	197
				199	208	210	211	241							
CS	(R*4)	ARRAY	TIRES	31C											
D	(R*4)	ARRAY	SPMASS	20C											
DBX	(R*4)	ARRAY	CMASS	24C	99*	172*									
DBY	(R*4)	ARRAY	CMASS	24C	100*	173*									
DEEPIN	(R*4)		PIN	32C											
DELSPR	(R*4)	ARRAY	SPRING	12C											
DELT	(R*4)	ARRAY	TURN	25C	131*	132?	133?	172?	173?	220?	221?	229*	230*	278	279
DELTA	(R*4)	ARRAY	SPMASS	20C											
DERY	(R*4)	ARRAY		1	100	135	140	141	144	166	248				
DEW	(R*4)			229?	229	230									
DTHAX	(R*4)	ARRAY	SPRING	12C	336										

DTS	(R*4)	ARRAY	TIRES	31C									
DTX	(R*4)			170*	172	173							
DTY	(R*4)			171*	172	173							
DV	(R*4)	ARRAY	SPRING	12C									
DZAXLE	(R*4)	ARRAY	SPRING	12C	335								
DZDX	(R*4)			42*	204*	209?	210*	211	212	213	214	216	
DZDXO	(R*4)		ROADD	16C	204								
DZDY	(R*4)			43*	205*	209?	210	211*	213	215	217		
DZDYO	(R*4)		ROADD	16C	205								
FORSPR	(R*4)	ARRAY	SPRING	12C									
FPIN	(R*4)	ARRAY	PIN	32C									
FPINX	(R*4)	ARRAY	PIN	32C									
FPINY	(R*4)	ARRAY	PIN	32C									
FR	(R*4)	ARRAY		9D	39	407	408	420	421	433	434		
FSHIFT	(R*4)	ARRAY	TAND	30C									
FSPLIT	(R*4)	ARRAY	TAND	30C									
FT	(R*4)	ARRAY	STATIC	13C									
FTNG	(R*4)	ARRAY		5D									
FXI	(R*4)	ARRAY	TIRES	31C									
FXW	(R*4)	ARRAY	TIRES	31C	184	185	274	299					
FYI	(R*4)	ARRAY	TIRES	31C									
FYW	(R*4)	ARRAY	TIRES	31C	186	275	318						
GAM	(R*4)	ARRAY		11D	165*	257							
GAMD	(R*4)	ARRAY		11D	166*	258							
HEAD	(R*4)	ARRAY	PAGE	28C	355								
I	(I*4)			44*	45	46	53*	55	57*	58	63	64	67	69*	70
				71	98*	99	100	115*	117	118	120	138*	139	140	141
				142	143	144	147	149	151	153	154	155	156	157	158
				160	163*	164	165	166	169*	170	171	172	173	176*	178
				180	183	184	185	186	236*	238	240*	241	243	245	246
				247	248	250	251	252	254	255	256	257	258	259	260
				262*	264	266	273	274	275	276	277	278	279	283*	285
				287	296	297	298	299	300	301	302	306*	309	310	317
				318	319	320	324*	326	328	333	334	335	336	337	338
				339	340	341	342	343	351*	354	355	357	358	365	366
				373	375	377	378	381	383	396	291	393	394	395	396
				400	402	407	408	409	413	415	420	421	422	426	428
				433	434	435	438	440	442	444	446	448	450	452	
IADD	(I*4)			59*	60*	63									
IBK	(I*4)		BRAKE	27C											
IC	(I*4)			62*	63	66*	67	272*	273	274	275	276	277	293*	297
				298	299	300	301	302	316*	317	318	319	320		
ICOL	(I*4)			438*	440*	442*	444*	446*	448*	450*	452*				
IER	(I*4)			403*	404*	407	408	409	416*	417*	420	421	422	431*	432*
				433	434	435									
IHLF	(I*4)			135											
II	(I*4)			54*	55	61*	62	65*	66						
IIJ	(I*4)			294*	295?										
IIV	(I*4)			82*	83	86*	87	90*	91	94*	95				
IJ	(I*4)			363*	371*	377*	378*	393*	398*	394*	395*	396*	407*	408*	409*
				420*	421*	422*	433*	434*	435*						
ILINE	(I*4)			438*	440*	442*	444*	446*	448*	450*	452*				
INC	(I*4)			268*	269*	270*	273	274	275	276	277	278	279	289*	290*
				291*	296	297	298	299	300	301	302	312*	313*	314*	317
				318	319	320	330*	331*	332*	333	334	335	336	337	338
				339	340	341	342	343							
IOUT	(I*4)	ARRAY	INOUT	14C	70										
IPR	(I*4)	ARRAY		9C	55*	63*	67*	73*	76*	79*	83*	87*	91*	95*	354

NDIM	(I*4)			135									
NOSPR	(I*4)	ARRAY	SPRING	120									
NOTURN	(I*4)	ARRAY	TURN	250	132?	133?	220?	221?					
NP	(I*4)		PAGE	280									
NPAGE	(I*4)	ARRAY		70									
NS	P*4	ARRAY	STATIC	40	130								
NTP	(I*4)	ARRAY	BRAKE	270	284								
NUM	(I*4)	ARRAY	BRAKE	270									
OM	(R*4)	ARRAY		90	183*	301							
OMD	(R*4)	ARRAY		80	184*	302							
OUT	(R*4)	ARRAY		70	238*	246*	247*	249*	250*	251*	252*	254*	255*	256*	257*
				258*	259*	260*	273*	274*	275*	276*	277*	278*	279*	296*	297*
				298*	299*	300*	301*	302*	317*	318*	319*	320*	333*	334*	335*
				336*	337*	338*	339*	340*	341*	342*	343*	438	440	442	444
				446	448	450	452								
P	(R*4)	ARRAY	BOUT	170	297										
PAGE	(R*4)			51*	352	455*									
PBAR	(R*4)	ARRAY	ECTOUT	230											
PH	(R*4)	ARRAY	SPMASS	200											
PHIBAR	(R*4)	ARRAY	ECTOUT	230	104?	105?	106?	107	108	109?	110	111	112	113	114?
				122	123	124	191?	192?	193?	194	195	196?	197	198	199
				200	201?	212	213	214	215	216	217	278	279		
PI	(R*4)			41*	151										
PJ	(R*4)	ARRAY	SPMASS	200											
PPMT	(R*4)	ARRAY		100	135	350*									
PSIDD	(R*4)	ARRAY	CMASS	240	144*	171									
PSIDDL	(R*4)	ARRAY	PIN	320	208?	241?									
PTPD	(R*4)		BOUT	170											
PTRDD	(R*4)			295?	296										
PW	(R*4)	ARRAY	SPMASS	200											
PX	(R*4)	ARRAY	SPMASS	200											
PZ	(R*4)	ARRAY	SPMASS	200											
PO	(R*4)	ARRAY	BOUT	170											
R	I*4		PAGE	20	280										
RADIAN	(R*4)			40*	165	166	250	251	252	256	278	279	317	334	336
RCI	(R*4)	ARRAY	UNSPM	190											
RST	(R*4)	ARRAY	UNSPM	190	278	279									
S	(R*4)	ARRAY	SPRING	120	338	341									
SD	(R*4)	ARRAY	SPRING	120	339	342									
SE	(R*4)	ARRAY	STATIC	130	340	343									
SIDE	(R*4)	ARRAY		340	37										
SLIP	(R*4)	ARRAY	TIRES	310	183	303									
SNI	(R*4)	ARRAY	SPMASS	200											
SPAGE	(R*4)			352*	355	454*									
SPST	(R*4)	ARRAY	TRANS	210	105*	107	108	109	110	111	192*	194	195	196	197
				198	210	211									
SRAD	(R*4)	ARRAY	TIRES	310	183	184									
SSLIP	(R*4)	ARRAY		110	147*	149*	151*	153	154	256					
SSOLD	(R*4)	ARRAY		110	45*	153	154*								
STEP	(R*4)			50*	233	234*									
SYI	(R*4)	ARRAY	UNSPM	190											
T	(R*4)	ARRAY	BOUT	170	184	298									
TALIGN	(R*4)	ARRAY	TOUT	150	320										
TD	(R*4)	ARRAY	TAND	300	170	171									
TFORAX	(R*4)	ARRAY	PIN	320											
TFORAY	(R*4)	ARRAY	PIN	320											
TFORAZ	(R*4)		PIN	320											
TFORBX	(R*4)	ARRAY	PIN	320											

TFORBY	(R*4)	ARRAY	PIN	32C								
TFORBZ	(R*4)		PIN	32C								
THETAX	(R*4)	ARRAY	SPRING	12C	278	279	334					
TINC	(R*4)		INOUT	14C	234							
TIRES	(R*4)	ARRAY		34C	35							
TEST	(R*4)	ARRAY	BOUT	17C								
TOL	(R*4)	ARRAY	SPMASS	20C	208	241						
TQ	(R*4)	ARRAY	BRAKE	27C								
TRA	(R*4)	ARRAY	UNSPM	19C								
TRAD	(R*4)	ARRAY		11D	158*	160*	255					
TSUM	(R*4)	ARRAY	TIRES	31C								
TURNX	(R*4)	ARRAY	TURN	25C	132?	133?	220?	221?				
TURNY	(R*4)	ARRAY	TURN	25C	132?	133?	220?	221?				
UBAR	(R*4)	ARRAY	ECTOUT	23C	183							
UW	(R*4)	ARRAY	WSPD	18C								
VEH	(R*4)	ARRAY		34D	35	363	371	377	378	398	394	395	407	408	420
				421	433	434									
VJ	(R*4)	ARRAY	SPMASS	20C											
VW	(R*4)	ARRAY	SPMASS	20C											
W	I*4		PAGE	2D	29C	355W	359W	363W	367W	371W	377W	378W	379W	382W	383W
				384W	388W	394W	395W	396W	397W	407W	408W	409W	410W	420W	421W
				422W	423W	433W	434W	435W	436W	438W	440W	442W	444W	446W	448W
				450W	452W										
WHBS	(R*4)	ARRAY	SPMASS	20C											
WHEELI	(R*4)	ARRAY	WHEEL	33C	184										
X	(R*4)			135	137	153	155	220?	221?	229?	233	238	295?		
XAXECR	(R*4)	ARRAY	TIRES	31C											
XBACK	(R*4)	ARRAY	ROADD	16C	208	241									
XBAR	(R*4)	ARRAY	ECTOUT	23C	189	207	239								
XDOCM	(R*4)	ARRAY	CMASS	24C	142*	17C									
XFRONT	(R*4)	ARRAY	ROADD	16C	208	241									
XLOAD	(R*4)	ARRAY	SPRING	12C											
XMOM	(R*4)		PIN	32C											
XMUX	(R*4)	ARRAY		9C	185*	276									
XOLD	(R*4)	ARRAY		11D	46*	153	155*								
XPRINT	(R*4)			52*	137*										
XROAD	(R*4)			189*	208*	209?	239*	241*	254						
XTP	(R*4)	ARRAY	BRAKE	27C	295?										
XX	(R*4)	ARRAY	BRAKE	27C											
Y	(R*4)	ARRAY		1	10D	135	136	140	141	145	146	147	149	156	158
				165	17D	223	224	225	226	227	232	246	247	346	
YAXECR	(R*4)	ARRAY	TIRES	31C											
YDOCM	(R*4)	ARRAY	CMASS	24C	143*	171									
YDR	(R*4)	ARRAY		6D	223*	224*	225*	226*	227*	228?					
YMUX	(R*4)	ARRAY		9C	186*	277	319								
YROAD	(R*4)			207*	209?										
YT	(R*4)	ARRAY	TIRES	31C											
YTD	(R*4)	ARRAY	TIRES	31C											
YTP	(R*4)	ARRAY	BRAKE	27C	295?										
YY	(R*4)	ARRAY	BRAKE	27C											
ZAXLE	(R*4)	ARRAY	SPRING	12C	333										
ZZJ	(R*4)	ARRAY	CCLOC	22C											
ZO	(R*4)	ARRAY	SPRING	12C											

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES

10	47	44							
20	55	53	54						
30	63	61							
40	67	65							
50	68	56	57	58	64				
60	72	71							
70	73	72							
80	75	71							
90	76	75							
100	78	71							
110	79	78							
120	81	71							
130	83	81	82						
140	85	71							
150	87	85	86						
160	89	71							
170	91	89	90						
180	93	71							
190	95	93	94						
200	96	69	70	74	77	80	84	88	92
210	101	98							
220	102	97							
230	120	117							
240	121	115	116	119					
250	126	103							
260	131	127	129	129	130				
270	149	146							
280	151	145							
290	152	148	150						
300	160	157							
310	161	139	159						
320	167	163							
330	174	169							
340	175	162	168						
350	187	181	182						
360	188	176	177	178					
370	207	203							
380	210	206							
390	212	202							
400	218	190							
410	223	219							
420	231	222							
430	235	232							
440	238	236	237						
450	253	249							
460	261	240	242						
470	280	271							
480	281	267							
490	292	262	263	264					
500	303	292							
510	304	288							
520	305	283	284	285					
530	321	315							
540	322	311							
550	323	306	307	308					
560	344	329							
570	345	324	325	326					
580	353	346							

590	351		348									
600	357		356									
610	361		357									
620	365		356									
630	369		365									
640	373		356									
650	381		356									
660	386		381									
670	390		356									
680	399		356									
690	412		356									
700	425		356									
710	438		372									
720	440		368									
730	442		364	380	424							
740	444		360									
750	446		385	398								
760	448		437									
770	450		389									
780	452		411									
790	454		351	353	354	439	441	443	445	447	449	451	453
800	458	FMT	355									
810	459	FMT	359									
820	460	FMT	363									
830	461	FMT	367									
840	462	FMT	371									
850	463	FMT	377									
860	464	FMT	378									
870	465	FMT	379									
880	466	FMT	382									
890	467	FMT	383	396	409	422	435					
900	468	FMT	388									
910	469	FMT	394									
920	470	FMT	395									
930	471	FMT	384	397								
940	472	FMT	407									
950	473	FMT	409									
960	474	FMT	410									
970	475	FMT	420									
980	476	FMT	421									
990	477	FMT	423									
1000	478	FMT	433									
1010	479	FMT	434									
1020	480	FMT	436									
1030	481	FMT	438									
1040	482	FMT	440									
1050	483	FMT	444									
1060	484	FMT	446									
1070	485	FMT	448									
1080	486	FMT	450									
1090	487	FMT	452									
1100	488	FMT	442									

TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUB?=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION

MTS LINE NO. | INTERNAL STMT NO. | **** P R I N T E D Y **** INPUT LISTING

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1501.                  C                                                                    V1015010
1502.                  C   *** SUBROUTINE FCTI ***                                          V1015020
1503.                  C                                                                    V1015030
1504.            1        SUBROUTINE FCTI(Y)                                                V1015040
1505.            2        INTEGER R, W                                                      V1015050
1506.            3        REAL M, KT, NS, K, JA, KTCN, KPIN, M, MCS, KRS, MCS               V1015060
1507.            4        DIMENSION FVX(4), FVY(4)                                          V1015070
1508.            5        DIMENSION TCNA(4,3), TONE(4,3), DD(3), TCNGLE(4)                  V1015080
1509.            6        DIMENSION CTON(4), VTONA(4,3), VTONB(4,3), VDD(4), VTONGL(4)      V1015090
1510.            7        COMMON /TOUT/ TALIGN(4,2,2,2)                                     V1015100
1511.            8        DIMENSION FSUMSM(4,3), TSUMSM(4,3)                                V1015110
1512.            9        DIMENSION CT(4,2,2,2), SRS(4,2,2,2)                               V1015120
1513.           10        DIMENSION FRZ(4,2,2), XXS(4,2,2), VM(4), PHIDD(4), GVWM(4), FX(4),V1015130
1514.                    1          FY(4), FZ(4)                                            V1015140
1515.           11        DIMENSION Y(112), DFDY(112), M(4), IX(6), FSUM(4,3)               V1015150
1516.           12        DIMENSION DZO(3), DZI(3)                                          V1015160
1517.           13        DIMENSION KPIN(3), TKPIN(3), VKPIN(3), VTKPIN(3), XKP(4,3),       V1015170
1518.                    1          TXKP(4,3)                                               V1015180
1519.           14        DIMENSION THETA(4), XMARTY(2), SIZ(4)                             V1015190
1520.           15        DIMENSION DUMMY(2), TONEA(4), TONNB(4), KTON(4)                   V1015200
1521.           16        COMMON /DUAL/ DUALTQ(4,2,2,2)                                     V1015210
1522.           17        COMMON /KEY/ MVEH, KEY(4,2), KDELLY(4)                            V1015220
1523.           18        COMMON /TAND/ FSPLIT(4,2), FSHIFT(4,2), TD(4,2)                   V1015230
1524.           19        COMMON /SPMASS/ WHPS(4), BBL(4), A3(4), APHI(4), DELTA(4), VW(4), V1015240
1525.                    1          VJ(4,3), PW(4), PX(4), PZ(4), PJ(4,3), SNL(4,2), D(4),  V1015250
1526.                    2          PH(4), TCL(4), MCS                                      V1015260
1527.           20        COMMON /BRAKE/ BTQ(4,2,2,2), TQ(4,2,2,2,2), NUM(4,2,2,2,2),       V1015270
1528.                    1          XX(4,320), YY(4,320), NTP(1,2), XTP(10), YTP(10), IBK   V1015280
1529.           21        COMMON /TURN/ NOTURN(2,2), TURNX(50), TURNY(50), DELT(4,2,2,2)    V1015290
1530.           22        COMMON /ROADD/ DZDXC, DZDYC, IROAD, XFRONT(4), XBACK(4)           V1015300
1531.           23        COMMON /CGLOC/ AL(4,2,2), BX(4,2,2), ZZJ(4)                       V1015310
1532.           24        COMMON /STATIC/ NS(4,2,2), ET(4), SF(4,2,2,2)                     V1015320
1533.           25        COMMON /TIRES/ SRAD(4,2,2,2), CALF(4,2,2,2), DTS(4,2,2,2),        V1015330
1534.                    1          KT(4,2,2,2), CS(4,2,2,2), N(4,2,2,2), CAT(4,2,2,2),     V1015340
1535.                    2          YT(4,2,2,2), YTD(4,2,2,2), TSUM(4,3), XAXFOR(4,2,2),    V1015350
1536.                    3          YAXFOR(4,2,2), FYI(4,2,2,2), FXT(4,2,2,2), FXW(4,2,2,2),V1015360
1537.                    4          FYW(4,2,2,2), ALFFRM(4,2,2,2), SLIP(4,2,2,2)            V1015370
1538.           26        COMMON /UNSPM/ K(4,2,2,2), C(4,2,2,2), JA(4,2,2), RCI(4,2,2),     V1015380
1539.                    1          SYI(4,2,2), TRA(4,2,2), ASW(4,2,2), ASM(4,2,2),         V1015390
1540.                    2          AXDELT(4,2,2), RST(4,2,2), KRS(4,2,2), AUXROL(4,2,2),   V1015400
1541.                    3          CF(4,2,2,2)                                             V1015410
1542.           27        COMMON /FCTOUT/ XBAR(4,3), PHIBAR(4,3), UBAR(4,3), PBAR(4,3)      V1015420
1543.           28        COMMON /PIN/ FPINX(4), FPINY(4), FPIN(3), XMOM, DELPIN, PSIDOL(4),V1015430
1544.                    1          TFORAX(4), TFORBX(4), TFORAY(4), TFORBY(4), TFORAZ, TFORBZ V1015440
1545.           29        COMMON /CMACC/ XDDCM(4), YDDCM(4), PSIDD(4), DBX(4), DBY(4)       V1015450
1546.           30        COMMON /SPRING/ S(4,2,2,2), SD(4,2,2,2), THETAX(4,2,2),           V1015460
1547.                    1          DTHAX(4,2,2), ZAXLE(4,2,2), DZAXLE(4,2,2), DV(4,2,2,2), V1015470
1548.                    2          NOSPR(4,2,2,2,2), DEFSPR(320), FORSPR(320), ZO(4,2,2,2), V1015480
1549.                    3          XLOAD(4,2,2,2)                                          V1015490
1550.           31        COMMON /TRANS/ CPSI(4), SPSI(4), A(4,3,3), BZ(4,3,3)              V1015500
1551.           32        COMMON /BOLT/ P(4,2,2,2), FO(4,2,2,2), TLST(4,2,2,2), T(4,2,2,2), V1015510
1552.                    1          PIRD                                                    V1015520
1553.                  C                                                                    V1015530
1554.                  C   BEGIN INITIALIZATIONS                                           V1015540
1555.                  C                                                                    V1015550
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   MTS          INTERNAL       ****  C T N T I O Y ****
LINE NO.        STMT NO.       INPUT LISTING

1556.              33           G = 32.16666                                                          V1015560
1557.              34           DO 20 IVEH = 1, MVEH                                                  V1015570
1558.              35             PSIDOT(IVEH) = 0.                                                   V1015580
1559.              36             VM(IVEH) = VW(IVEH) / G                                             V1015590
1560.              37             GVWM(IVEH) = VM(IVEH)                                               V1015600
1561.              38             DO 20 JSUS = 1, 2                                                   V1015610
1562.              39               JKK = 1                                                           V1015620
1563.              40               IF (IVEH .EQ. 2 .AND. JSUS .EQ. 1) GO TO 20                       V1015630
1564.              41               IF (KEY(IVEH,JSUS) .NE. 0) JKK = 2                                V1015640
1565.              42               DO 10 KAX = 1, JKK                                                V1015650
1566.              43                 ASM(IVEH,JSUS,KAX) = ASW(IVEH,JSUS,KAX) / G                     V1015660
1567.              44                 GVWM(IVEH) = GVWM(IVEH) + ASM(IVEH,JSUS,KAX)                    V1015670
1568.              45                 XAXEOR(IVEH,JSUS,KAX) = 0.                                      V1015680
1569.              46                 YAXEOR(IVEH,JSUS,KAX) = 0.                                      V1015690
1570.              47                 DO 10 LSIDE = 1, 2                                              V1015700
1571.              48                   DV(IVEH,JSUS,KAX,LSIDE) = 20. * CF(IVEH,JSUS,KAX,LSIDE) *    V1015710
1572.                 1                 (1./ASM(IVEH,JSUS,KAX) + SYI(IVEH,JSUS,KAX)**2/JA(IVEH,      V1015720
1573.                 2                 JSUS,KAX)) * .0025                                            V1015730
1574.              49                   IF (CF(IVEH,JSUS,KAX,LSIDE) .EQ. 0.) DV(IVEH,JSUS,KAX,       V1015740
1575.                 1                 LSIDE) = 0.0001                                               V1015750
1576.              50           10      CONTINUE                                                      V1015760
1577.              51           20 CONTINUE                                                           V1015770
1578.              52             DO 30 I = 1, 2                                                      V1015780
1579.              53               DO 30 J = 1, 3                                                    V1015790
1580.              54                 XKP(I,J) = 0.                                                   V1015800
1581.              55                 TXKP(I,J) = 0.                                                  V1015810
1582.              56           30 CONTINUE                                                           V1015820
1583.              57             XKP(1,1) = BBL(1) - AI(1,2,1) - TD(1,2) / 2.                        V1015830
1584.              58             XKP(1,3) = DELTA(1) - D(1)                                          V1015840
1585.              59             TXKP(2,3) = DELTA(2) - D(1)                                         V1015850
1586.              60             TXKP(2,1) = AI(2,1,1)                                               V1015860
1587.              61             DZO(3) = DZDXO * XKP(1,1) - (1. - COS(DZDXO)*COS(DZDYO)) * XKP(1,   V1015870
1588.                            13)                                                                   V1015880
1589.              62             DZO(2) = -DZDYO * XKP(1,2)                                          V1015890
1590.              63             DZO(1) = -(1. - COS(DZDXO)) * XKP(1,1) - DZDXO * XKP(1,3)           V1015900
1591.              64             DZI(3) = DZDXO * TXKP(2,1) - (1. - COS(DZDXO)*COS(DZDYO)) * TXKP(   V1015910
1592.                            12,3)                                                                 V1015920
1593.              65             DZI(2) = -DZDYO * TXKP(2,3)                                         V1015930
1594.              66             DZI(1) = -(1. - COS(DZDXO)) * TXKP(2,1) - DZDXO * TXKP(2,3)         V1015940
1595.                    C                                                                            V1015950
1596.                    C    SET FIFTH WHEEL SPRING RATE                                             V1015960
1597.                    C                                                                            V1015970
1598.              67             PIN = 12. * VW(1)                                                   V1015980
1599.              68             IF (VW(2) .LT. VW(1) .AND. MVEH .GT. 1) PIN = 12. * VW(2)           V1015990
1600.              69             CFW = .5 * SQRT(PIN*VM(1))                                          V1016000
1601.              70             IF (VW(2) .LT. VW(1) .AND. MVEH .GT. 1) CFW = .5 * SQRT(PIN*VM(2))  V1016010
1602.                    C                                                                            V1016020
1603.                    C      SET TONGUE SPRING RATE                                                V1016030
1604.                    C                                                                            V1016040
1605.              71             IF (MVEH .LT. 3) GO TO 50                                           V1016050
1606.              72             DO 40 IV = 3, 4                                                     V1016060
1607.              73               KTON(IV) = VW(IV) * 12.                                           V1016070
1608.              74               IF (VW(IV - 1) .LT. VW(IV)) KTON(IV) = 12. * VW(IV - 1)           V1016080
1609.              75               CTON(IV) = .5 * SQRT(KTON(IV)*VM(IV))                             V1016090
1610.              76               IF (VW(IV - 1) .LT. VW(IV)) CTON(IV) = .5 * SQRT(KTON(IV)*VM(IV   V1016100
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   MTS          INTERNAL        **** P R I N T O U T ****
LINE NO.        STMT NO.        INPUT LISTING

1611.                          1   - 1))
1612.              77             TCNHA(IV - 1) = DELTA(IV - 1) - PH(IV - 1)                                          V1016110
1613.              78             TCNHB(IV) = DELTA(IV) - D(IV)                                                       V1016120
1614.              79             TEORAY(IV - 1) = C.                                                                 V1016130
1615.              80             XMARTY(IV - 2) = A1(IV - 1,2,2) - TD(IV - 1,2) / 2. + A3(IV - 1)                    V1016140
1616.                           1   +APH1(IV) + A1(IV,1,1) - TD(IV,1) / 2.                                            V1016150
1617.              81          40 CONTINUE                                                                            V1016160
1618.              82          50 CONTINUE                                                                            V1016170
1619.              83             XFRONT(1) = 0.                                                                      V1016180
1620.              84             XBACK(1) = -XKP(1,1)                                                                V1016190
1621.              85             XFRONT(2) = TXKP(2,1)                                                               V1016200
1622.              86             XBACK(2) = A1(2,2,2) - TD(2,2) / 2. + A3(2)                                         V1016210
1623.              87             XFRONT(3) = A1(3,1,1) - TD(3,1) / 2.                                                V1016220
1624.              88             XBACK(3) = A1(3,2,2) - TD(3,2) / 2. + A3(3)                                         V1016230
1625.              89             XFRONT(4) = A1(4,1,1) - TD(4,1) / 2.                                                V1016240
1626.              90             XBACK(4) = A1(4,2,2) - TD(4,2) / 2.                                                 V1016250
1627.              91             CG5 = 10.                                                                           V1016260
1628.              92             TOGZ = 0.                                                                           V1016270
1629.              93             DO 70 IVEH = 1, MVEH                                                                V1016280
1630.              94               SIGN = -1.                                                                        V1016290
1631.              95               DO 70 JSUS = 1, 2                                                                 V1016300
1632.              96                 SIGN = -SIGN                                                                    V1016310
1633.              97                 JKK = 1                                                                         V1016320
1634.              98                 IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                                              V1016330
1635.              99                 DO 60 KAX = 1, JKK                                                              V1016340
1636.             100                   XXS(IVEH,JSUS,KAX) = A1(IVEH,JSUS,KAX) * SIGN                                V1016350
1637.             101          60       ERZ(IVEH,JSUS,KAX) = DELTA(IVEH) - RCI(IVEH,JSUS,KAX)                        V1016360
1638.             102          70 CONTINUE                                                                            V1016370
1639.             103             ERZ(2,1,1) = DELTA(2) - D(1)                                                        V1016380
1640.                          C                                                                                      V1016390
1641.                          C    INITIALIZE WORK VARIABLES                                                         V1016400
1642.                          C                                                                                      V1016410
1643.             104             DO 80 IVEH = 1, MVEH                                                                V1016420
1644.             105               DO 80 IDIR = 1, 3                                                                 V1016430
1645.             106                 IX(IDIR) = IDIR                                                                 V1016440
1646.             107                 IX(IDIR + 3) = IDIR                                                             V1016450
1647.             108                 IV = (IVEH - 1) * 28 + IDIR                                                     V1016460
1648.             109                 XBAR(IVEH,IDIR) = Y(IV)                                                         V1016470
1649.             110                 PHIBAR(IVEH,IDIR) = Y(IV + 3)                                                   V1016480
1650.             111                 UBAR(IVEH,IDIR) = Y(IV + 6)                                                     V1016490
1651.             112                 PBAR(IVEH,IDIR) = Y(IV + 9)                                                     V1016500
1652.             113          80 CONTINUE                                                                            V1016510
1653.                          C                                                                                      V1016520
1654.                          C    INITIALIZATIONS COMPLETE                                                          V1016530
1655.                          C                                                                                      V1016540
1656.             114             RETURN                                                                              V1016550
1657.                          C                                                                                      V1016560
1658.                          C    ENTRY POINT FROM HPCG                                                             V1016570
1659.                          C                                                                                      V1016580
1660.                          C    FOR VEHICLE I:                                                                    V1016590
1661.                          C           XBAR(I,1) = X                                                              V1016600
1662.                          C           XBAR(I,2) = Y...THESE ARE INERTIAL LOCATORS OF SPRUNG MASS CGV1016620
1663.                          C           XBAR(I,3) = Z                                                              V1016630
1664.                          C                                                                                      V1016640
1665.                          C           PHIBAR(I,1) = PHI                                                          V1016650
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  MTS          INTERNAL       ****  F T N T I D Y ****
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1666.                  C           PHIBAR(I,2) = THETA ... THESE ARE SPRUNG MASS EULER ANGLES   V1016660
1667.                  C           PHIBAR(I,3) = PST                                           V1016670
1668.                  C                                                                       V1016680
1669.                  C           UBAR(I,1) = U                                               V1016690
1670.                  C           UBAR(I,2) = V                                               V1016700
1671.                  C           UBAR(I,3) = W ...THESE ARE SP. MASS VELOCITIES IN BODY COORDSV1016710
1672.                  C                                                                       V1016720
1673.                  C           PBAR(I,1) = P                                               V1016730
1674.                  C           PBAR(I,2) = Q ... THESE ARE SPRUNG MASS ROTATION RATES ABOUT V1016740
1675.                  C           PBAR(I,3) = R      BODY X,Y,Z                               V1016750
1676.                  C                                                                       V1016760
1677.                  C                                                                       V1016770
1678.                  C                                                                       V1016780
1679.                  C   THERE ARE 28 STATE VARIABLES FOR EACH VEHICLE                      V1016790
1680.                  C   Y1 = X    Y7 = U                                                    V1016800
1681.                  C   Y2 = Y    Y8 = V                                                    V1016810
1682.                  C   Y3 = Z    Y9 = W                                                    V1016820
1683.                  C                                                                       V1016830
1684.                  C   Y4 = PHI      Y10 = P                                               V1016840
1685.                  C   Y5 = THETA    Y11 = Q                                               V1016850
1686.                  C   Y6 = PSI      Y12 = R                                               V1016860
1687.                  C                                                                       V1016870
1688.                  C   Y13 = ZAXLE, SUSPENSION 1 (S1), AXLE 1 (A1)                        V1016880
1689.                  C   Y14 = D/DT(Y13)                                                     V1016890
1690.                  C   Y15 = THETAXLE SUSPENSION 1 AXLE 1                                 V1016900
1691.                  C   Y16 = D/DT(Y15))                                                    V1016910
1692.                  C   Y17 = ZAXLE, S1, A2                                               V1016920
1693.                  C   Y18 = D/DT(Y17)                                                    V1016930
1694.                  C   Y19 = THETAXLE S1,A2                                             V1016940
1695.                  C   Y20 = D/DT(Y19)                                                    V1016950
1696.                  C   Y21 = ZAXLE S2,A1                                                 V1016960
1697.                  C   Y22 = D/DT(Y21                                                    V1016970
1698.                  C   Y23 = THETAXLE S2,A1                                             V1016980
1699.                  C   Y24 = D/DT(Y23)                                                    V1016990
1700.                  C   Y25 = ZAXLE S2,A2                                                 V1017000
1701.                  C   Y26 = D/DT(Y25)                                                    V1017010
1702.                  C   Y27 = THETAXLE S2,A2                                             V1017020
1703.                  C   Y28 = D/DT(Y27)                                                    V1017030
1704.                  C                                                                       V1017040
1705.        115             ENTRY FCT(X,Y,DERY)                                            V1017050
1706.                  C                                                                       V1017060
1707.                  C   SET WORK VARIABLES FOR CONVIENCE:  STATE VARIABLES                V1017070
1708.                  C                                                                       V1017080
1709.        116             DO 90 IVEH = 1, MVEH                                           V1017090
1710.        117               DO 90 IDIR = 1, 3                                            V1017100
1711.        118                 IV = (IVEH - 1) * 28 + IDIR                                V1017110
1712.        119                 XBAR(IVEH,IDIR) = Y(IV)                                    V1017120
1713.        120                 PHIBAR(IVEH,IDIR) = Y(IV + 3)                              V1017130
1714.        121                 UBAR(IVEH,IDIR) = Y(IV + 6)                                V1017140
1715.        122                 PBAR(IVEH,IDIR) = Y(IV + 9)                                V1017150
1716.        123             90 CONTINUE                                                    V1017160
1717.                  C                                                                       V1017170
1718.                  C   AXLE LOCATIONS                                                    V1017180
1719.                  C                                                                       V1017190
1720.        124             DO 110 IVEH = 1, MVEH                                          V1017200
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      MTS          INTERNAL       **** P R I N T O U T ****
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    1721.            125            SIGN = 1.                                                              V1017210
    1722.            126            DO 110 JSUS = 1, 2                                                     V1017220
    1723.            127              JKK = 1                                                              V1017230
    1724.            128              IF (IVEH .EQ. 2 .AND. JSUS .EQ. 1) GO TO 110                         V1017240
    1725.            129              IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                                   V1017250
    1726.            130              IF (IVEH .EQ. 1 .AND. JSUS .EQ. 1) JKK = 1                           V1017260
    1727.            131              DO 100 KAX = 1, JKK                                                  V1017270
    1728.            132                DO 100 LSIDE = 1, 2                                                V1017280
    1729.            133                  SIGN = -SIGN                                                     V1017290
    1730.            134                  IA = (IVEH - 1) * 28 + (JSUS - 1) * 8 + (KAX - 1) * 4 + 13       V1017300
    1731.                       C                                                                          V1017310
    1732.                       C   LOCATE AXLES FOR LATER CALCULATIONS.                                   V1017320
    1733.                       C  SUBSCRIPT NOTES ... IVEH IS VEHICLE NUMBER 1=TRACTOR, 2=SEMI-TRAILER    V1017330
    1734.                       C    3 = PUP, 4 = NEXT PUP... JSUS IS SUSPENSION, #1 = FRONT, #2 = REAR    V1017340
    1735.                       C      KAX IS AXLE NUMBER, START WITH 1 ON EACH NEW SUSPENSION.             V1017350
    1736.                       C      LSIDE IS SIDE, 1=LEFT,2=RIGHT                                       V1017360
    1737.                       C   ZAXLE IS THE VERTICAL POSITION OF THE AXLE, POSITIVE IS DOWN,          V1017370
    1738.                       C   DZAXLE IS D/DT(ZAXLE)                                                 V1017380
    1739.                       C   THETAX IS THE ROLL ANGLE OF THE AXLE, POSITIVE RIGHT SIDE DOWN,       V1017390
    1740.                       C   DTHAX IS THE ROLL VELOCITY OF THE AXLE                                 V1017400
    1741.                       C                                                                          V1017410
    1742.                       C   YT IS THE VERTICAL POSITION OF THE TIRE, POSITIVE DOWN                 V1017420
    1743.                       C   YTD IS THE VERTICAL VELOCITY OF THE TIRE                               V1017430
    1744.                       C                                                                          V1017440
    1745.            135                ZAXLE(IVEH,JSUS,KAX) = Y(IA)                                       V1017450
    1746.            136                DZAXLE(IVEH,JSUS,KAX) = Y(IA + 1)                                  V1017460
    1747.            137                THETAX(IVEH,JSUS,KAX) = Y(IA + 2)                                  V1017470
    1748.            138                DTHAX(IVEH,JSUS,KAX) = Y(IA + 3)                                   V1017480
    1749.            139                YT(IVEH,JSUS,KAX,LSIDE) = ZAXLE(IVEH,JSUS,KAX) + SIGN *           V1017490
    1750.                     1           TRA(IVEH,JSUS,KAX) * THETAX(IVEH,JSUS,KAX)                       V1017500
    1751.            140                YTD(IVEH,JSUS,KAX,LSIDE) = DZAXLE(IVEH,JSUS,KAX) + SIGN *         V1017510
    1752.                     1           TRA(IVEH,JSUS,KAX) * DTHAX(IVEH,JSUS,KAX)                        V1017520
    1753.            141      100     CONTINUE                                                            V1017530
    1754.            142      110 CONTINUE                                                                V1017540
    1755.                       C                                                                          V1017550
    1756.                       C   SUSPENSION FORCES                                                     V1017560
    1757.                       C                                                                          V1017570
    1758.            143          DO 140 IVEH = 1, NVEH                                                  V1017580
    1759.            144            SIGN = 1.                                                            V1017590
    1760.            145            DO 140 JSUS = 1, 2                                                   V1017600
    1761.            146              JKK = 1                                                            V1017610
    1762.            147              IF (IVEH .EQ. 2 .AND. JSUS .EQ. 1) GO TO 140                       V1017620
    1763.            148              IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                                 V1017630
    1764.            149              IF (IVEH .EQ. 1 .AND. JSUS .EQ. 1) JKK = 1                         V1017640
    1765.            150              DO 130 KAX = 1, JKK                                                V1017650
    1766.            151                DO 130 LSIDE = 1, 2                                              V1017660
    1767.            152                  SIGN = -SIGN                                                   V1017670
    1768.                       C                                                                          V1017680
    1769.                       C   SIGN = -1 INDICATES LEFT SIDE                                         V1017690
    1770.                       C                                                                          V1017700
    1771.                       C                                                                          V1017710
    1772.                       C   LOCATE SPRUNG MASS SPRINGS CONNECTION.                                V1017720
    1773.                       C     A(I,J,K) TRANSFORMS FROM BODY TO INERTIAL.                           V1017730
    1774.                       C    THESE ARE COMPUTED IN OUTPUT.                                         V1017740
    1775.                       C                                                                          V1017750
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   MTS          INTERNAL        ****  F I N T I D Y ****
 LINE NO.       STMT NO.        INPUT LISTING

 1776.                      C    Z POSITION OF SPRUNG MASS:  XXS MEASURE X OF SUSPENSION FROM          V1017760
 1777.                      C    SPRUNG MASS CENER, POSITIVE IS FORWARD.  YS MEASURE Y OF SUSPENSION V1017770
 1778.                      C    POSITIVE IS RIGHT.                                                   V1017780
 1779.                      C                                                                         V1017790
 1780.          153                      YS = SYI(IVEH,JSUS,KAX) * SIGN                               V1017800
 1781.                      C                                                                         V1017810
 1782.          154                      SMS = XXS(IVEH,JSUS,KAX) * A(IVEH,1,3) + YS * A(IVEH,2,3)    V1017820
 1783.                     1             + XBAR(IVEH,3)                                               V1017830
 1784.          155                      UU = UBAR(IVEH,1) + PBAR(IVEH,2) * ERZ(IVEH,JSUS,KAX) -      V1017840
 1785.                     1             PBAR(IVEH,3) * YS                                            V1017850
 1786.          156                      VV = UBAR(IVEH,2) + PBAR(IVEH,3) * XXS(IVEH,JSUS,KAX) -      V1017860
 1787.                     1             PBAR(IVEH,1) * ERZ(IVEH,JSUS,KAX)                            V1017870
 1788.          157                      WW = UBAR(IVEH,3) + PBAR(IVEH,1) * YS - PBAR(IVEH,2) *       V1017880
 1789.                     1             XXS(IVEH,JSUS,KAX)                                           V1017890
 1790.                      C                                                                         V1017900
 1791.                      C    Z VELOCITY OF SPRUNG MASS                                            V1017910
 1792.                      C                                                                         V1017920
 1793.          158                      SMSD = UU * A(IVEH,1,3) + VV * A(IVEH,2,3) + WW * A(IVEH,    V1017930
 1794.                     1             3,3)                                                         V1017940
 1795.          159            120       CONTINUE                                                     V1017950
 1796.                      C                                                                         V1017960
 1797.                      C    CALL  SUSPENSION ROUTINE                                             V1017970
 1798.                      C                                                                         V1017980
 1799.          160                      CALL TANDIN(IVEH, JSUS, KAX, LSIDE, SMS, SMSD, SIGN)         V1017990
 1800.                      C                                                                         V1018000
 1801.                      C    CALL FOR SPRING FORCES                                               V1018010
 1802.                      C                                                                         V1018020
 1803.          161                      CALL LINE(IVEH, JSUS, KAX, LSIDE, SE, K, C, CE)              V1018030
 1804.          162            130      CONTINUE                                                     V1018040
 1805.          163            140 CONTINUE                                                          V1018050
 1806.                      C                                                                         V1018060
 1807.                      C    KINEMATIC RELATIONSHIPS BETWEEN THE STATE VARIABLES                  V1018070
 1808.                      C                                                                         V1018080
 1809.          164              DO 160 J = 1, MVEH                                                  V1018090
 1810.          165                DO 150 I = 1, 3                                                   V1018100
 1811.          166                  IV = (J - 1) * 28 + I                                           V1018110
 1812.          167                  DERY(IV) = 0.                                                   V1018120
 1813.          168                  DO 150 IXX = 1, 3                                               V1018130
 1814.                      C                                                                         V1018140
 1815.                      C    THESE RELATE VELOCITIES IN INERTIAL X,Y,Z TO U,V,W                    V1018150
 1816.                      C                                                                         V1018160
 1817.          169                    DERY(IV) = UBAR(J,IXX) * A(J,IXX,I) + DERY(IV)                 V1018170
 1818.          170            150   CONTINUE                                                        V1018180
 1819.                      C                                                                         V1018190
 1820.                      C    THESE RELATE RATES OF CHANGE OF PHI,THETA,PSI TO P,Q,R               V1018200
 1821.                      C                                                                         V1018210
 1822.          171               DERY((J - 1)*28 + 6) = PBAR(J,3) + PBAR(J,2) * SIN(PHIBAR(J,1))    V1018220
 1823.          172               DERY((J - 1)*28 + 4) = PBAR(J,1) + PBAR(J,3) * TAN(PHIBAR(J,2))    V1018230
 1824.                           1   + PBAR(J,2) * PHIBAR(J,1) * PHIBAR(J,2)                         V1018240
 1825.          173               DERY((J - 1)*28 + 5) = PBAR(J,2) - PBAR(J,3) * SIN(PHIBAR(J,1))    V1018250
 1826.          174            160 CONTINUE                                                          V1018260
 1827.                      C                                                                         V1018270
 1828.                      C    NOW WE COMPUTE THE POSITIONS AND VELOCITY OF THE ENDS OF THE DOLLY    V1018280
 1829.                      C    FOR USE IN DOLLY FORCE CALCULATION.  A IS AT PINTLE HOOK,  B IS AT   V1018290
 1830.                      C    TURNTABLE.                                                           V1018300
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   MTS          INTERNAL        **** F T N T I D Y ****
LINE NO.        STMT NO.        INPUT LISTING

1831.                     C                                                                                  V1018310
1832.              175            IF (MVEH .LT. 3) GO TO 220                                                 V1018320
1833.              176            DO 210 IVEH = 3, MVEH                                                      V1018330
1834.              177              WW = 0.                                                                  V1018340
1835.              178              VV = 1.                                                                  V1018350
1836.              179              TONGLE(IVEH) = 0.                                                        V1018360
1837.              180              IVM = IVEH - 1                                                           V1018370
1838.                     C                                                                                  V1018380
1839.                     C    COMPUTE PINTLE HOOK POSITION - TONA, AND TURNTABLE POSITION - TONB           V1018390
1840.                     C    FIND INERTIAL VELOCITIES AT EACH END OF TONGUE                               V1018400
1841.                     C                                                                                  V1018410
1842.              181              KL = (IVEH - 2) * 28                                                     V1018420
1843.              182              KKL = KL + 28                                                            V1018430
1844.                     C                                                                                  V1018440
1845.                     C    INERTIAL VELOCITY OF PINTLE HOOK                                            V1018450
1846.                     C                                                                                  V1018460
1847.              183              VIAX = DERY(1 + KL) + (A1(IVM,2,1) + TD(IVM,2)/2. + A3(IVM)) *           V1018470
1848.                     1   SIN(Y(KL + 6)) * Y(12 + KL)                                                  V1018480
1849.              184              VIAY = DERY(2 + KL) - (A1(IVM,2,1) + TD(IVM,2)/2. + A3(IVM)) *           V1018490
1850.                     1   COS(Y(KL + 6)) * Y(12 + KL)                                                  V1018500
1851.                     C                                                                                  V1018510
1852.                     C    INERTIAL VELOCITY OF TURNTABLE                                              V1018520
1853.                     C                                                                                  V1018530
1854.              185              V2AX = DERY(1 + KKL) - (A1(IVEH,1,1) - TD(IVEH,1)/2.) * SIN(Y(           V1018540
1855.                     1   KKL + 6)) * Y(12 + KKL)                                                      V1018550
1856.              186              V2AY = DERY(2 + KKL) + (A1(IVEH,1,1) - TD(IVEH,1)/2.) * COS(Y(           V1018560
1857.                     1   KKL + 6)) * Y(12 + KKL)                                                      V1018570
1858.              187              DO 170 I = 1, 3                                                          V1018580
1859.              188                IF (I .EQ. 3) WW = 1.                                                  V1018590
1860.              189                TONA(IVM,I) = XPAR(IVM,I) - (A1(IVM,2,1) + TD(IVM,2)/2. + A3(          V1018600
1861.                     1     IVM)) * (A(IVM,1,I) - VV) + TONHA(IVM) * (A(IVM,3,I) - WW)                   V1018610
1862.              190                TONB(IVEH,I) = XBAR(IVEH,I) + (A1(IVEH,1,1) - TD(IVEH,1)/2.) *          V1018620
1863.                     1     (A(IVEH,1,I) - VV) + TONHB(IVEH) * (A(IVEH,3,I) - WW)                        V1018630
1864.              191                DD(I) = TONA(IVM,I) - TONB(IVEH,I)                                     V1018640
1865.                     C                                                                                  V1018650
1866.                     C    VV = 1 ONLY WHEN I = 1, OTHERWISE VV = 0                                    V1018660
1867.                     C                                                                                  V1018670
1868.              192                TONGLE(IVEH) = TONGLE(IVEH) + (DD(I) + VV*TOL(IVEH)) ** 2           V1018680
1869.                     C                                                                                  V1018690
1870.                     C    TONGLE IS NOW (EXTEND - TEL)**2+DY**2+DZ**2                                 V1018700
1871.                     C                                                                                  V1018710
1872.              193              VV = 0.                                                                  V1018720
1873.              194       170    CONTINUE                                                                 V1018730
1874.                     C                                                                                  V1018740
1875.                     C    FIND STEER ANGLE,DELTA, RIGHT TURN POSITIVE                                 V1018750
1876.                     C                                                                                  V1018760
1877.              195              IF (ABS(DD(2)) .LT. TOL(IVEH)) GO TO 190                                 V1018770
1878.              196              PSIDOT(IVEH) = 1.57 * DD(2) / ABS(DD(2))                                 V1018780
1879.              197              GO TO 199                                                                V1018790
1880.              198       180    PSIDOT(IVEH) = ARSIN(DD(2)/TOL(IVEH))                                    V1018800
1881.              199       190    DELT(IVEH,1,1,1) = PSIDOT(IVEH) - PEIPAR(IVEH,3)                         V1018810
1882.              200              DELT(IVEH,1,1,2) = DELT(IVEH,1,1,1)                                      V1018820
1883.              201              IF (KEY(IVEH,JSUS) .EQ. 0) GO TO 200                                     V1018830
1884.              202              DELT(IVEH,1,2,1) = DELT(IVEH,1,1,1)                                      V1018840
1885.              203              DELT(IVEH,1,2,2) = DELT(IVEH,1,1,2)                                      V1018850
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   MTS          INTERNAL       **** F I N I T O Y ****
LINE NO.        STMT NO.       INPUT LISTING

1886.             206       200   CONTINUE                                                          V1018860
1887.                     C                                                                         V1018870
1888.                     C   NOW TAKE COMPONENT OF DOLLY PINTLE - T.TABLE VELOCITY ALONG DOLLY    V1018880
1889.                     C   LONGITUDINAL AXIS                                                     V1018890
1890.                     C                                                                         V1018900
1891.             205             VTONGL(IVEH) = (VTAX - V2AX) * COS(PSIDOL(IVEH)) + (VTAY - V2AY)V1018910
1892.                            1   * SIN(PSIDOL(IVEH))                                           V1018920
1893.                     C                                                                         V1018930
1894.                     C   FIND DOLLY PITCH ANGLE, FRONT END UP                                  V1018940
1895.                     C                                                                         V1018950
1896.             206             THETA(IVEH) = -ATAN(OD(3)/TOL(IVEH))                              V1018960
1897.                     C                                                                         V1018970
1898.                     C   COMPUTE TONGUE FORCE, TFORAX.  DIRECTION IS FORWARD ON LEAD TRAILER  V1018980
1899.                     C                                                                         V1018990
1900.             207             TFORAX(IVEH - 1) = -KTEN(IVEH) * (SQRT(TONGLE(IVEH)) - TOL(IVEH)V1019000
1901.                            1  ) - CTON(IVEH) * VTONGL(IVEH)                                   V1019010
1902.             208       210 CONTINUE                                                            V1019020
1903.             209       220 CONTINUE                                                            V1019030
1904.                     C                                                                         V1019040
1905.             210           DO 270 IVEH = 1, MVEH                                               V1019050
1906.                     C                                                                         V1019060
1907.                     C   FSUM AND TSUM ARE FOR EQUATIONS OF MOTION. FX,FY,TZ ARE FOR           V1019070
1908.                     C   CONSTRAINT FORCE CALCULATIONS                                         V1019080
1909.                     C                                                                         V1019090
1910.             211             FX(IVEH) = 0.                                                     V1019100
1911.             212             FY(IVEH) = 0.                                                     V1019110
1912.             213             TZ(IVEH) = 0.                                                     V1019120
1913.             214             DO 230 JV = 1, 3                                                  V1019130
1914.             215               FSUM(IVEH,JV) = 0.                                              V1019140
1915.             216               TSUM(IVEH,JV) = 0.                                              V1019150
1916.             217       230   CONTINUE                                                          V1019160
1917.             218             DO 270 JSUS = 1, 2                                                V1019170
1918.                     C                                                                         V1019180
1919.                     C   NO FRONT TIRES ON THE SEMI-TRAILER                                    V1019190
1920.                     C                                                                         V1019200
1921.             219               IF (IVEH .EQ. 2 .AND. JSUS .EQ. 1) GO TO 270                    V1019210
1922.             220               JKK = 1                                                         V1019220
1923.             221               IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                              V1019230
1924.             222               IF (IVEH .EQ. 1 .AND. JSUS .EQ. 1) JKK = 1                      V1019240
1925.             223               DO 260 KAX = 1, JKK                                             V1019250
1926.             224                 DO 250 LSIDE = 1, 2                                           V1019260
1927.                     C                                                                         V1019270
1928.                     C   ROLL STEER CALCULATION                                                V1019280
1929.                     C                                                                         V1019290
1930.             225                   DELT(IVEH,JSUS,KAX,LSIDE) = DELT(IVEH,JSUS,KAX,LSIDE) +   V1019300
1931.                            1      RST(IVEH,JSUS,KAX) * (PHIBAR(IVEH,1) - THETAX(IVEH,JSUS,  V1019310
1932.                            2      KAX))                                                     V1019320
1933.             226                   CALL BRAKE2(IVEH, JSUS, KAX, LSIDE, XXS, X)               V1019330
1934.             227                   DO 240 IXY = 1, 2                                         V1019340
1935.                     C                                                                         V1019350
1936.                     C   CALCULATE ALL TIRE FORCES                                           V1019360
1937.                     C                                                                         V1019370
1938.             228       240         CALL TIRE(IVEH, JSUS, KAX, LSIDE, IXY, 1, DT, SPS, XXS,   V1019380
1939.                            1            DERY, TALIGN, X)                                     V1019390
1940.             229                   FXI(IVEH,JSUS,KAX,LSIDE) = FXB(IVEH,JSUS,KAX,LSIDE) * COS(V1019400
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     MTS          INTERNAL       ****  E N T R I C Y ****
   LINE NO.       STMT NO.       INPUT LISTING

    1941.                        1         DELT(IVEH,JSUS,KAX,LSIDE)) - EYW(IVEH,JSUS,KAX,LSIDE) *    V1019410
    1942.                        2         SIN(DELT(IVEH,JSUS,KAX,LSIDE))                             V1019420
    1943.          230                     EYI(IVEH,JSUS,KAX,LSIDE) = EXW(IVEH,JSUS,KAX,LSIDE) * SIN(V1019430
    1944.                        1         DELT(IVEH,JSUS,KAX,LSIDE)) + EYW(IVEH,JSUS,KAX,LSIDE) *    V1019440
    1945.                        2         COS(DELT(IVEH,JSUS,KAX,LSIDE))                             V1019450
    1946.                  C                                                                          V1019460
    1947.                  C   EX,EY, AND TZ ARE USED HERE TO SUM THE FORCES FOR USE IN               V1019470
    1948.                  C   CONSTRAINT CALCULATIONS                                               V1019480
    1949.                  C                                                                          V1019490
    1950.          231                     EX(IVEH) = EX(IVEH) + EXI(IVEH,JSUS,KAX,LSIDE)             V1019500
    1951.          232                     EY(IVEH) = EY(IVEH) + EYI(IVEH,JSUS,KAX,LSIDE)             V1019510
    1952.          233                     TZ(IVEH) = TZ(IVEH) + TALIGN(IVEH,JSUS,KAX,LSIDE) +        V1019520
    1953.                        1         DUALTQ(IVEH,JSUS,KAX,LSIDE) + (EXI(IVEH,JSUS,KAX,LSIDE)) *V1019530
    1954.                        2          TRA(IVEH,JSUS,KAX) * (-1) ** (LSIDE + 1) + (EYI(IVEH,     V1019540
    1955.                        3         JSUS,KAX,LSIDE)) * BX(IVEH,JSUS,KAX)                       V1019550
    1956.          234                     IF (IVEH .GT. 2 .AND. JSUS .EQ. 1) GO TO 250               V1019560
    1957.                  C                                                                          V1019570
    1958.                  C   SUM ALIGNING TORQUES FOR ALL TIRES EXCEPT ON DOLLIES                   V1019580
    1959.                  C                                                                          V1019590
    1960.          235                     TSUM(IVEH,3) = TSUM(IVEH,3) + TALIGN(IVEH,JSUS,KAX,LSIDE) V1019600
    1961.                        1         + DUALTQ(IVEH,JSUS,KAX,LSIDE)                              V1019610
    1962.          236           250       CONTINUE                                                   V1019620
    1963.          237           260     CONTINUE                                                     V1019630
    1964.          238           270 CONTINUE                                                         V1019640
    1965.                  C                                                                          V1019650
    1966.                  C   DOLLY AND KINGPIN FORCES AND MOMENTS                                   V1019660
    1967.                  C                                                                          V1019670
    1968.          239             IF (NVEH .LT. 2) GO TO 340                                       V1019680
    1969.          240             DO 330 IVEH = 2, NVEH                                            V1019690
    1970.          241               IF (IVEH .GT. 2) GO TO 320                                     V1019700
    1971.                  C                                                                          V1019710
    1972.                  C   KINGPIN CALCULATIONS FROM HERE TO STATEMENT 676                       V1019720
    1973.                  C                                                                          V1019730
    1974.          242               DELPIN = 0.                                                    V1019740
    1975.          243               DO 290 I = 1, 3                                                V1019750
    1976.          244                 TKPIN(I) = 0.                                                V1019760
    1977.          245                 KPIN(I) = 0.                                                 V1019770
    1978.                  C                                                                          V1019780
    1979.                  C     PIN LOCATIONS FOR T/SEMI, WE HAVE PINTLE/TONGUE IN TONA,TONB         V1019790
    1980.                  C                                                                          V1019800
    1981.          246                 DO 290 KK = 1, 3                                             V1019810
    1982.          247                   VV = 0.                                                    V1019820
    1983.          248                   IF (KK .EQ. I) VV = 1.                                     V1019830
    1984.          249                   KPIN(I) = XKP(IVEH - 1,KK) * (A(IVEH - 1,KK,I) - VV) + KPIN(V1019840
    1985.                        1        I) + XBAR(IVEH - 1,I) / 3.                                 V1019850
    1986.          250           290     TKPIN(I) = TXKP(IVEH,KK) * (A(IVEH,KK,I) - VV) + TKPIN(I) +  V1019860
    1987.                        1     XBAR(IVEH,I) / 3.                                            V1019870
    1988.          251                 IF (IRCAD .GT. 0) KPIN(I) = KPIN(I) - DZO(I)                 V1019880
    1989.          252                 IF (IRCAD .GT. 0) TKPIN(I) = TKPIN(I) - DZ1(I)               V1019890
    1990.          253                 VV = 1.                                                      V1019900
    1991.          254                 IF (I .EQ. 1) VV = SIN(PHIBAR(IVEH,3))                       V1019910
    1992.          255                 IF (I .EQ. 2) VV = COS(PHIBAR(IVEH,3))                       V1019920
    1993.          256                 VKPIN(1) = DERY(1) - Y(12) * XKP(1,1) * SIN(Y(6))            V1019930
    1994.          257                 VTKPIN(1) = DERY(29) - Y(40) * TXKP(2,1) * SIN(Y(34))        V1019940
    1995.          258                 VKPIN(2) = DERY(2) + Y(12) * XKP(1,1) * COS(Y(6))            V1019950
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   MTS          INTERNAL       ****  F I N T I C Y ****
 LINE NO.       STMT NO.       INPUT LISTING

 1996.            258              VTKPIN(2) = DERY(30) + Y(40) * TXKP(2,1) * COS(Y(34))          V1019960
 1997.            259              VKPIN(3) = DERY(3) - Y(11) * XKP(1,1)                          V1019970
 1998.            261              VTKPIN(3) = DERY(31) - Y(39) * TXKP(2,1)                       V1019980
 1999.            262              DELPIN = (KPIN(I) - TKPIN(I)) ** 2 + DELPIN                    V1019990
 2000.            263         280  FPIN(I) = (KPIN(I) - TKPIN(I)) * PIN + (VKPIN(I) - VTKPIN(I)) * V1020000
 2001.                           1  CFW                                                            V1020010
 2002.            264              SIGN = 1                                                       V1020020
 2003.            265              XMOM = (PHIBAR(2,1) - PHIBAR(1,1)) * MCS + (PBAR(2,1) - PBAR(1, V1020030
 2004.                           1  1)) * CCS                                                      V1020040
 2005.            266              DO 310 JVEH = 1, 2                                             V1020050
 2006.            267                SIGN = -SIGN                                                 V1020060
 2007.            268                FPINX(JVEH) = 0.                                             V1020070
 2008.            269                FPINY(JVEH) = 0.                                             V1020080
 2009.            270                DO 300 JJ = 1, 3                                             V1020090
 2010.            271                  FPINX(JVEH) = SIGN * FPIN(JJ) * A(JVEH,1,JJ) + FPINX(JVEH) V1020100
 2011.            272                  FPINY(JVEH) = SIGN * FPIN(JJ) * A(JVEH,2,JJ) + FPINY(JVEH) V1020110
 2012.            273         300      CONTINUE                                                   V1020120
 2013.            274                  FPINX(JVEH) = SIGN * (FPIN(1)*COS(PHIBAR(JVEH,3)) + FPIN(2)* V1020130
 2014.                           1     SIN(PHIBAR(JVEH,3)))                                       V1020140
 2015.            275                  FPINY(JVEH) = SIGN * (-FPIN(1)*SIN(PHIBAR(JVEH,3)) + FPIN(2)* V1020150
 2016.                           1     COS(PHIBAR(JVEH,3)))                                       V1020160
 2017.            276                  FX(JVEH) = FX(JVEH) + FPINX(JVEH)                          V1020170
 2018.            277                  FY(JVEH) = FY(JVEH) + FPINY(JVEH)                          V1020180
 2019.            278                  FSUM(JVEH,1) = FSUM(JVEH,1) + FPINX(JVEH)                  V1020190
 2020.            279                  FSUM(JVEH,2) = FSUM(JVEH,2) + FPINY(JVEH)                  V1020200
 2021.            280         310      FSUM(JVEH,3) = FSUM(JVEH,3) + SIGN * FPIN(3)               V1020210
 2022.            281                  TSUM(1,1) = -FPINY(1) * XKP(IVEH - 1,3) + XMOM             V1020220
 2023.            282                  TSUM(2,1) = -FPINY(2) * TXKP(IVEH,3) - XMOM                V1020230
 2024.            283                  TSUM(1,2) = -FPIN(3) * (A1(1,2,1) + TD(1,2)/2. - BB1(1)) + V1020240
 2025.                           1     FPINX(1) * XKP(IVEH - 1,3)                                 V1020250
 2026.            284                  TSUM(2,2) = -FPIN(3) * A3(2) + FPINX(2) * TXKP(IVEH,3)     V1020260
 2027.                       C                                                                   V1020270
 2028.                       C    TZ FOR CONSTRAINT, TSUM FOR SPRUNG MASS                        V1020280
 2029.                       C                                                                   V1020290
 2030.            285                  TSUM(1,3) = TSUM(1,3) - FPINY(1) * (A1(1,2,1) + TD(1,2)/2. - V1020300
 2031.                           1     BB1(1))                                                    V1020310
 2032.            286                  TSUM(2,3) = TSUM(2,3) + FPINY(2) * A1(2,1,1)               V1020320
 2033.            287                  TZ(1) = TZ(1) + FPINY(1) * (BX(1,2,1) + BB1(1) - TD(1,2)/2.) V1020330
 2034.            288                  TZ(2) = TZ(2) + FPINY(2) * BX(2,1,1)                       V1020340
 2035.            289                  GO TO 330                                                  V1020350
 2036.            290         320      CONTINUE                                                   V1020360
 2037.                       C                                                                   V1020370
 2038.                       C    EST. EFFECTS OF TONGUE FORCES ON ENTIRE VEHICLE FOR CONSTRAINT CALC.V1020380
 2039.                       C                                                                   V1020390
 2040.            291              IVC = IVEH - 1                                                 V1020400
 2041.                       C                                                                   V1020410
 2042.                       C    POSITIVE GAMMA INDICATES DOLLY YAW ANGLE .GT. SEMI TRAILER YAW ANGLEV1020420
 2043.                       C                                                                   V1020430
 2044.            292              GAMMA = PHIBAR(IVEH,3) - PHIBAR(IVEH - 1,3) + DELT(IVEH,1,1,1) V1020440
 2045.            293              SINGAM = SIN(GAMMA)                                            V1020450
 2046.            294              COGAMA = SQRT(1. - SINGAM**2)                                  V1020460
 2047.            295              SINDEL = SIN(DELT(IVEH,1,1,1))                                 V1020470
 2048.            296              CODELTA = (1. - SINDEL**2) ** .5                               V1020480
 2049.            297              COTHETA = COS(THETA(IVEH))                                     V1020490
 2050.                       C                                                                   V1020500
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  MTS          INTERNAL       ****  F T M I B D Y ****
LINE NO.       STMT NO.       INELT LISTING

2051.                  C    XXDUM IS FORCE ON LEAD TRAILER                                          V1020510
2052.                  C    XDUM IS ON TRAILING TRAILER                                             V1020520
2053.                  C                                                                            V1020530
2054.            298           XDUM = -CTHETA * TFORAX(IVD) * CDELTA + TFORAY(IVD) * SINDEL        V1020540
2055.            299           XXDUM = CTHETA * TFORAX(IVD) * CGAMMA - TFORAY(IVD) * SINGAM        V1020550
2056.            300           YDUM = -TFORAY(IVD) * CDELTA - CTHETA * TFORAX(IVD) * SINDEL        V1020560
2057.            301           YYDUM = TFORAY(IVD) * CGAMMA + CTHETA * TFORAX(IVD) * SINGAM        V1020570
2058.            302           FX(IVEH) = FX(IVEH) + XDUM                                          V1020580
2059.            303           FX(IVD) = XXDUM + FX(IVD)                                           V1020590
2060.            304           FY(IVEH) = FY(IVEH) + YDUM                                          V1020600
2061.            305           FY(IVD) = FY(IVD) + YYDUM                                           V1020610
2062.            306           FSUM(IVEH,1) = FSUM(IVEH,1) + XDUM                                  V1020620
2063.            307           FSUM(IVD,1) = FSUM(IVD,1) + XXDUM                                   V1020630
2064.            308           FSUM(IVEH,2) = FSUM(IVEH,2) + YDUM                                  V1020640
2065.            309           FSUM(IVD,2) = FSUM(IVD,2) + YYDUM                                   V1020650
2066.            310           TZ(IVD) = TZ(IVD) + YYDUM * (BX(IVD,2,1) - A3(IVD) - TD(IVD,2)/     V1020660
2067.                        1  2.)                                                                 V1020670
2068.            311           TZ(IVEH) = TZ(IVEH) + YDUM * (BX(IVEH,1,1) - TD(IVEH,1)/2. + (      V1020680
2069.                        1  BP1(IVEH) + TOL(IVEH))*CDELTA) - XDUM * TOL(IVEH) * SINDEL        V1020690
2070.            312           TSUM(IVD,3) = TSUM(IVD,3) - YYDUM * (A1(IVD,2,1) + TD(IVD,2)/2.     V1020700
2071.                        1  + A3(IVD))                                                          V1020710
2072.            313           TSUM(IVEH,3) = TSUM(IVEH,3) + YDUM * (TOL(IVEH)*CDELTA + A1(        V1020720
2073.                        1  IVEH,1,1) - TD(IVEH,1)/2.) - SINDEL * TOL(IVEH) * XDUM            V1020730
2074.                  C                                                                            V1020740
2075.                  C    PICK UP TORQUE CAUSED BY DOLLY - PINTLE HOOK FORCES FOR LATER USE       V1020750
2076.                  C                                                                            V1020760
2077.            314           TSUM(IVD,1) = -YYDUM * TONHA(IVD) + TSUM(IVD,1)                     V1020770
2078.            315           TSUM(IVD,2) = XXDUM * TONHA(IVD) + TSUM(IVD,2)                      V1020780
2079.            316           TSUM(IVEH,1) = TSUM(IVEH,1) - YDUM * TONHB(IVEH)                    V1020790
2080.            317           TSUM(IVEH,2) = TSUM(IVEH,2) + XDUM * TONHB(IVEH)                    V1020800
2081.            318     330 CONTINUE                                                              V1020810
2082.            319     340 CONTINUE                                                              V1020820
2083.                  C                                                                            V1020830
2084.                  C    AXLE CONSTRAINTS                                                        V1020840
2085.                  C                                                                            V1020850
2086.                  C    FIRST ESTIMATE THE ACCELERATIONS OF EACH VEHICLE IN THE BODY X AND YV1020860
2087.                  C    DIRECTIONS, ANY YAW ACCELERATION PSIDD.  NOTE THE MASSES AND            V1020870
2088.                  C    INERTIAS INCLUDE SPRUNG AND UNSPRUNG MASSES                             V1020880
2089.                  C                                                                            V1020890
2090.            320           XROAD = XBAR(1,1)                                                   V1020900
2091.            321           DO 410 IVEH = 1, NVEH                                               V1020910
2092.            322             RJBELG = 0.                                                       V1020920
2093.            323             IF (IROAD .EQ. 0) GO TO 360                                       V1020930
2094.            324             DZDX = DZDX0                                                      V1020940
2095.            325             DZDY = DZDY0                                                      V1020950
2096.            326             CPSI(IVEH) = COS(PHIBAR(IVEH,3))                                  V1020960
2097.            327             SPSI(IVEH) = SIN(PHIBAR(IVEH,3))                                  V1020970
2098.            328             IF (IROAD .GE. 0) GO TO 350                                       V1020980
2099.            329             YROAD = XBAR(IVEH,2)                                              V1020990
2100.            330             IF (IVEH .GT. 1) XROAD = XROAD - XBACK(IVEH - 1) * CPSI(IVEH -    V1021000
2101.                        1  1) - TOL(IVEH) * COS(PSIDOL(IVEH)) - XPERNT(IVEH) * CPSI(IVEH)     V1021010
2102.            331             CALL RCADDZ(XROAD, YROAD, DZDX, DZDY)                             V1021020
2103.            332     350     DZDX = CPSI(IVEH) * DZEX + SPSI(IVEH) * DZFY                      V1021030
2104.            333             DZDY = -SPSI(IVEH) * DZDX + CPSI(IVEH) * DZDY                     V1021040
2105.            334     360     XPDCM(IVEH) = FX(IVEH) / GVW1(IVEH)                               V1021050
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   MTS          INTERNAL       ****  F T N T I O Y ****
 LINE NO.       STMT NO.       INPUT LISTING

 2106.            335            YDOCM(IVEH) = FY(IVEH) / GVWM(IVEH)                                          V1021060
 2107.            336            PSIDD(IVEH) = TZ(IVEH) / ZZJ(IVEH)                                           V1021070
 2108.            337            PSIDSQ = PBAR(IVEH,3) ** 2                                                   V1021080
 2109.                       C                                                                               V1021090
 2110.            338            SIGN = 1.                                                                    V1021100
 2111.            339            DO 410 JSUS = 1, 2                                                           V1021110
 2112.            340              JKK = 1                                                                    V1021120
 2113.            341              IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                                         V1021130
 2114.            342              IF (IVEH .EQ. 1 .AND. JSUS .EQ. 1) JKK = 1                                 V1021140
 2115.            343              IF (IVEH .EQ. 2 .AND. JSUS .EQ. 1) GO TO 410                               V1021150
 2116.            344              DO 400 KAX = 1, JKK                                                        V1021160
 2117.            345                XAXEOR(IVEH,JSUS,KAX) = 0.                                               V1021170
 2118.            346                DO 370 LSIDE = 1, 2                                                      V1021180
 2119.            347                  SIGN = -SIGN                                                           V1021190
 2120.            348                  FAXLE = FXI(IVEH,JSUS,KAX,LSIDE) - ASM(IVEH,JSUS,KAX) / 2.V1021200
 2121.                     1             * (XDOCM(IVEH) - PSIDSQ*BX(IVEH,JSUS,KAX))                         V1021210
 2122.                       C                                                                               V1021220
 2123.                       C   XAXEOR IS CONSTRAINT FORCE IN BODY X.  POSITIVE FORWARD ON SP MASS  V1021230
 2124.                       C   YAXEOR IS CONSTRAINT FORCE IN BODY Y.  POSITIVE RIGHT ON SPRUNG MASSV1021240
 2125.                       C                                                                               V1021250
 2126.            349                  XAXEOR(IVEH,JSUS,KAX) = XAXEOR(IVEH,JSUS,KAX) + FAXLE                 V1021260
 2127.            350          370     TSUM(IVEH,3) = TSUM(IVEH,3) - FAXLE * TRA(IVEH,JSUS,KAX) *  V1021270
 2128.                          1       SIGN                                                                   V1021280
 2129.            351                  YAXEOR(IVEH,JSUS,KAX) = FYI(IVEH,JSUS,KAX,2) + FYI(IVEH,      V1021290
 2130.                          1       JSUS,KAX,1) - ASM(IVEH,JSUS,KAX) * (YDOCM(IVEH) + PSIDD(      V1021300
 2131.                          2       IVEH)*BX(IVEH,JSUS,KAX))                                               V1021310
 2132.            352                  TSUM(IVEH,3) = TSUM(IVEH,3) + YAXEOR(IVEH,JSUS,KAX) * XXS(    V1021320
 2133.                          1       IVEH,JSUS,KAX)                                                         V1021330
 2134.            353                  FSUM(IVEH,1) = FSUM(IVEH,1) + XAXEOR(IVEH,JSUS,KAX)           V1021340
 2135.            354                  FSUM(IVEH,2) = FSUM(IVEH,2) + YAXEOR(IVEH,JSUS,KAX)           V1021350
 2136.            355                  TSUM(IVEH,1) = -YAXEOR(IVEH,JSUS,KAX) * ERZ(IVEH,JSUS,KAX) *V1021360
 2137.                          1       TSUM(IVEH,1)                                                           V1021370
 2138.            356                  FSUM(IVEH,3) = FSUM(IVEH,3) + SF(IVEH,JSUS,KAX,1) + SF(IVEH,V1021380
 2139.                          1       JSUS,KAX,2)                                                            V1021390
 2140.            357                  TSUM(IVEH,1) = TSUM(IVEH,1) + (SF(IVEH,JSUS,KAX,2) - SF(      V1021400
 2141.                          1       IVEH,JSUS,KAX,1)) * SYI(IVEH,JSUS,KAX)                                 V1021410
 2142.            358                  IF (IVEH .LE. 2 .OR. JSUS .EQ. 2) GO TO 400                            V1021420
 2143.                       C                                                                               V1021430
 2144.                       C   FOLLOWING STATEMENTS CONCERN DOLLIES ONLY                                    V1021440
 2145.                       C                                                                               V1021450
 2146.            359          380     CONTINUE                                                               V1021460
 2147.            360                  IF (KAX .GT. 1) GO TO 400                                              V1021470
 2148.            361                  IVD = IVEH - 1                                                         V1021480
 2149.            362                  CDELTA = COS(DELT(IVEH,1,1,1))                                         V1021490
 2150.            363                  SINDEL = SIN(DELT(IVEH,1,1,1))                                         V1021500
 2151.            364          390     TFORAY(IVD) = -(YAXEOR(IVEH,1,1)*CDELTA - XAXEOR(IVEH,1,1)* V1021510
 2152.                          1       SINDEL) * (BB1(IVEH) - TD(IVEH,1)/2.) / TCL(IVEH) - (YAXEOR(V1021520
 2153.                          2       IVEH,1,2)*CDELTA - XAXEOR(IVEH,1,2)*SINDEL) * (BB1(IVEH) +     V1021530
 2154.                          3       TD(IVEH,1)/2.) / TCL(IVEH) + (TALIGN(IVEH,1,1,1) + TALIGN(     V1021540
 2155.                          4       IVEH,1,1,2) + TALIGN(IVEH,1,2,1) + TALIGN(IVEH,1,2,2)) /       V1021550
 2156.                          5       TCL(IVEH)                                                              V1021560
 2157.                       C                                                                               V1021570
 2158.                       C   CONVERTER DOLLY CALCULATIONS                                                 V1021580
 2159.                       C                                                                               V1021590
 2160.            365                  IF (KDOLLY(IVEH) .EQ. 2) GO TO 400                                     V1021600
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   MTS          INTERNAL       **** F T N T I C Y ****
LINE NO.        STMT NO.       INPUT LISTING

2161.              366                TEDRAZ = -((SF(IVEH,1,1,1) + SF(IVEH,1,1,2))*(BB1(IVEH) -    V1021610
2162.                        1        TD(IVEH,1)/2.) + (CDELTA*XAXFOR(IVEH,1,1) + SINDEL*YAXFOR(   V1021620
2163.                        2        IVEH,1,1))*(FRZ(IVEH,1,1) - TONHB(IVEH)) + (CDELTA*XAXFOR(   V1021630
2164.                        3        IVEH,1,2) + SINDEL*YAXFOR(IVEH,1,2))*(FRZ(IVEH,1,2) - TONHB(V1021640
2165.                        4        IVEH)) + (SF(IVEH,1,2,1) + SF(IVEH,1,2,2))*(BB1(IVEH) + TD(  V1021650
2166.                        5        IVEH,1)/2.)) / TOL(IVEH) + (T(IVEH,1,1,1) + T(IVEH,1,1,2) +  V1021660
2167.                        6        T(IVEH,1,2,1) + T(IVEH,1,2,2)) / TOL(IVEH)                    V1021670
2168.              367                FSUM(IVEH,3) = FSUM(IVEH,3) + TEDRAZ                          V1021680
2169.              368                FSUM(IVD,3) = FSUM(IVD,3) - TEDRAZ                            V1021690
2170.              369                TSUM(IVD,2) = TSUM(IVD,2) + TEDRAZ * (A1(IVD,2,1) + TD(IVD,  V1021700
2171.                        1        2)/2. + A3(IVD))                                              V1021710
2172.              370                TSUM(IVEH,2) = TSUM(IVEH,2) + TEDRAZ * (A1(IVEH,1,1) + TD(   V1021720
2173.                        1        IVEH,1)/2. + TOL(IVEH)*CDELTA)                                V1021730
2174.              371                TSUM(IVEH,1) = TSUM(IVEH,1) - TEDRAZ * TOL(IVEH) * SINDEL     V1021740
2175.              372          400   CONTINUE                                                      V1021750
2176.              373          410 CONTINUE                                                       V1021760
2177.                        C                                                                     V1021770
2178.                        C   ADD IN MOMENT DUE TO ROTATION ABOUT ROLL AXIS                     V1021780
2179.                        C                                                                     V1021790
2180.              374             DO 450 IVEH = 1, NVEH                                          V1021800
2181.                        C                                                                     V1021810
2182.                        C   CALCULATE AVERAGE ROLL CENTER HEIGHT                              V1021820
2183.                        C                                                                     V1021830
2184.              375               NHT = 0                                                       V1021840
2185.              376               HT = 0.                                                       V1021850
2186.              377               DO 430 JSUS = 1, 2                                            V1021860
2187.              378                 JKK = 1                                                     V1021870
2188.              379                 IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                          V1021880
2189.              380                 DO 420 KAX = 1, JKK                                         V1021890
2190.              381                   NHT = NHT + 1                                             V1021900
2191.              382                   HT = HT + FRZ(IVEH,JSUS,KAX)                              V1021910
2192.              383          420      CONTINUE                                                  V1021920
2193.              384          430    CONTINUE                                                    V1021930
2194.                        C                                                                     V1021940
2195.              385               TSUM(IVEH,1) = TSUM(IVEH,1) + HT / NHT * VW(IVEH) * SIN(PHIBAR( V1021950
2196.                        1     IVEH,1))                                                        V1021960
2197.                        C                                                                     V1021970
2198.                        C   AUXROL IS TORQUE DUE TO AUXILARY ROLL STIFFNESS                  V1021980
2199.                        C                                                                     V1021990
2200.              386               DO 45) JSUS = 1, 2                                            V1022000
2201.              387                 JKK = 1                                                     V1022010
2202.              388                 IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                          V1022020
2203.              389                 IF (IVEH .EQ. 2 .AND. JSUS .EQ. 1) GO TO 450                V1022030
2204.              390                 DO 440 KAX = 1, JKK                                         V1022040
2205.              391                   AUXROL(IVEH,JSUS,KAX) = (THETAX(IVEH,JSUS,KAX) - Y(28*(IVEH V1022050
2206.                        1          - 1) + 4)) * KRS(IVEH,JSUS,KAX)                             V1022060
2207.                        C                                                                     V1022070
2208.                        C   ADD AUXROL TORQUE TO SPRUNG MASS                                 V1022080
2209.                        C                                                                     V1022090
2210.              392                   TSUM(IVEH,1) = TSUM(IVEH,1) + AUXROL(IVEH,JSUS,KAX)       V1022100
2211.              393          440      CONTINUE                                                  V1022110
2212.              394          450 CONTINUE                                                       V1022120
2213.                        C                                                                     V1022130
2214.                        C   AXLE EQUATIONS                                                   V1022140
2215.                        C                                                                     V1022150
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MTS LINE NO.  INTERNAL STMT NO.   **** E N T I D Y ****  INPUT LISTING

2216.           395                DO 460 IVEH = 1, MVEH                                                    V1022160
2217.           396                  DO 460 JSUS = 1, 2                                                     V1022170
2218.           397                    IF (IVEH .EQ. 2 .AND. JSUS .EQ. 1) GO TO 460                         V1022180
2219.           398                    CALL TANDYN(IVEH, JSUS, Y, DERY, XEAR, XXS, ERZ)                     V1022190
2220.           399           460  CONTINUE                                                                 V1022200
2221.                        C                                                                             V1022210
2222.                        C    EQUATIONS OF MOTION - ACCELERATIONS                                      V1022220
2223.                        C                                                                             V1022230
2224.           400                XROAD = XBAR(1,1)                                                        V1022240
2225.           401                DO 520 J = 1, MVEH                                                       V1022250
2226.           402                  IV = (J - 1) * 28 + 6                                                  V1022260
2227.           403                  DO 490 I = 1, 3                                                        V1022270
2228.           404                    DERY(IV + I) = 0.0                                                   V1022280
2229.           405                    DO 470 KIJ = 1, 3                                                    V1022290
2230.                        C                                                                             V1022300
2231.                        C  BZ ROTATES FROM GROUND PLANE AXES (INERTIAL ROTATED THRU PSI) TO BODY       V1022310
2232.                        C                                                                             V1022320
2233.           406                      DERY(IV + I) = FSUM(J,KIJ) * BZ(J,I,KIJ) + DERY(IV + I)            V1022330
2234.           407           470      CONTINUE                                                             V1022340
2235.           408           480    CONTINUE                                                               V1022350
2236.           409                  IF (IROAD .EQ. 0) GO TO 510                                            V1022360
2237.           410                  IF (IROAD .LE. 0) GO TO 490                                            V1022370
2238.           411                  DZDX = DZDX0                                                           V1022380
2239.           412                  DZDY = DZDY0                                                           V1022390
2240.           413                  GO TO 500                                                              V1022400
2241.           414           490    XROAD = XBAR(J,2)                                                      V1022410
2242.           415                  IF (J .GT. 1) XROAD = XROAD - XBACK(J - 1) * CPSI(J - 1) - TOL(        V1022420
2243.                              1   J) * COS(PSIDOL(J)) - XFRONT(J) * CPSI(J)                            V1022430
2244.           416                  CALL ROADDZ(XROAD, YROAD, DZDX, DZDY)                                  V1022440
2245.           417           500    DZDX = CPSI(J) * DZDX + SPSI(J) * DZDY                                 V1022450
2246.           418                  DZDY = -SPSI(J) * DZDX + CPSI(J) * DZDY                                V1022460
2247.           419                  DERY(IV + 1) = DERY(IV + 1) + 32.16666 * VM(J) * DZDX                  V1022470
2248.           420                  DERY(IV + 2) = DERY(IV + 2) + 32.16666 * VM(J) * DZDY                  V1022480
2249.           421           510    DO 520 I = 1, 3                                                        V1022490
2250.                        C                                                                             V1022500
2251.                        C    DERIVATIVE CALCULATIONS.  FOR EXAMPLE WE HAVE U-DOT = SUM OF FX/VM +      V1022510
2252.                        C    V*R - W*Q                                                                V1022520
2253.                        C                                                                             V1022530
2254.           422                      DERY(IV + I) = DERY(IV + I) / VM(J) - (PBAR(J,IX(I + 1))*UBAR(     V1022540
2255.                              1     J,IX(I + 2)) - PBAR(J,IX(I + 2))*UBAR(J,IX(I + 1)))                V1022550
2256.           423           520  CONTINUE                                                                 V1022560
2257.                        C                                                                             V1022570
2258.                        C    EQUATIONS OF MOTION - TORQUES                                            V1022580
2259.                        C                                                                             V1022590
2260.           424                DO 540 J = 1, MVEH                                                       V1022600
2261.           425                  DO 530 I = 1, 3                                                        V1022610
2262.           426                    IV = (J - 1) * 28 + I + 9                                            V1022620
2263.           427                    DERY(IV) = TSUM(J,1) * BZ(J,I,1) + TSUM(J,2) * BZ(J,I,2) +           V1022630
2264.                              1     TSUM(J,3) * BZ(J,I,3) - PBAR(J,IX(I + 1)) * PBAR(J,IX(I + 2))      V1022640
2265.                              2     * (VJ(J,IX(I + 2)) - VJ(J,IX(I + 1)))                              V1022650
2266.           428                    DERY(IV) = DERY(IV) / VJ(J,I)                                        V1022660
2267.           429           530    CONTINUE                                                               V1022670
2268.           430           540  CONTINUE                                                                 V1022680
2269.           431                RETURN                                                                   V1022690
2270.           432                END                                                                      V1022700
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES											
ABS	(R*4)	FCN	195	196										
ARSIN	(R*4)	FCN	199											
ATAN	(R*4)	FCN	206											
BRAKE?		SUBR	226											
COS	R*4	FCN	61	63	64	66	184	186	205	229	230	255	258	259	274
			275	297	326	330	362	415							
FCT	(R*4)	ENTRY	1150											
FCTI		SUBR	10											
LINE		SUBR	161											
ROADDZ		SUBR	331	416										
SIN	(R*4)	FCN	171	173	183	185	205	229	230	254	256	257	274	275	293
			295	327	363	385									
SQRT	(R*4)	FCN	69	70	75	76	207	294							
TAN	(R*4)	FCN	172											
TANDIN		SUBR	160											
TANDYN		SUBR	398											
TIRE		SUBR	228											
<EXIT>		SUBR	114	431										

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES										
A	(R*4)	ARRAY	TRANS	310	154	158	169	189	190	249	250	271	272	
ALFPRM	(R*4)	ARRAY	TIRES	250										
APHI	(R*4)	ARRAY	SPMASS	190	80									
ASM	(R*4)	ARRAY	UNSPM	260	43*	44	48	348	351					
ASW	(R*4)	ARRAY	UNSPM	260	43									
AUXROL	(R*4)	ARRAY	UNSPM	260	391*	392								
AXDFIT	(R*4)	ARRAY	UNSPM	260										
A1	(R*4)	ARRAY	CGLCC	230	57	60	90	86	87	88	89	90	100	183	184
				185	186	189	190	283	285	286	312	313	369	370	
A3	(R*4)	ARRAY	SPMASS	190	80	86	88	183	184	189	284	310	312	369	
BB1	(R*4)	ARRAY	SPMASS	190	57	283	285	287	311	364	366				
BTQ	(R*4)	ARRAY	BRAKE	200											
BX	(R*4)	ARRAY	CGLCC	230	233	287	288	310	311	348	351				
BZ	(R*4)	ARRAY	TRANS	310	406	427									
C	(R*4)	ARRAY	UNSPM	260	161?										
CALF	(R*4)	ARRAY	TIRES	250											
CAT	(R*4)	ARRAY	TIRES	250											
CC5	(R*4)			91*	265										
CDELTA	(R*4)			296*	298	300	311	313	362*	364	366	370			
CF	(R*4)	ARRAY	UNSPM	260	48	49	161?								
CFW	(R*4)			69*	70*	263									
CGAMMA	(R*4)			294*	299	301									
CPSI	(R*4)	ARRAY	TRANS	310	326*	330	332	333	415	417	418				
CS	(R*4)	ARRAY	TIRES	250											
CTHETA	(R*4)			297*	298	299	300	301							
CTON	(R*4)	ARRAY		60	75*	76*	207								
D	(R*4)	ARRAY	SPMASS	190	58	59	78	103							
DBX	(R*4)	ARRAY	CMACC	290											
DBY	(R*4)	ARRAY	CMACC	290											
DD	(R*4)	ARRAY		50	191*	192	195?	196?	198	206					
DEFSPR	(R*4)	ARRAY	SPRING	300											

			119	120	121	122	124*	128	129	130	134	135	136	137
			138	139	140	143*	147	148	149	153	154	155	156	157
			158	160?	161?	176*	178	180	181	185	186	190	191	192
			195	196	198	199	200	201	202	203	205	206	207	210*
			211	212	213	215	216	219	221	222	225	226?	228?	229
			230	231	232	233	234	235	240*	241	249	250	254	255
			281	282	283	284	291	292	295	297	302	304	306	308
			311	313	316	317	321*	326	327	329	330	332	333	334
			335	336	337	341	342	343	345	348	349	350	351	352
			353	354	355	356	357	358	361	362	363	364	365	366
			367	370	371	374*	379	382	385	388	389	391	392	395*
			397	399?										
IVM	(I*4)		180*	183	184	189	191							
IX	(I*4)	ARRAY	110	106*	107*	422	427							
IXX	(I*4)		168*	169										
IXY	(I*4)		227*	228?										
J	(I*4)		53*	54	55	164*	165	169	171	172	173	401*	402	406
			414	415	417	418	419	420	422	424*	426	427	428	
JA	R*4	ARRAY UNSPM	30	260	48									
JJ	(I*4)		270*	271	272									
JKK	(I*4)		39*	41*	42	97*	98*	99	127*	129*	130*	131	146*	148*
			149*	150	220*	221*	222*	223	340*	341*	342*	344	378*	379*
			380	387*	388*	390								
JSUS	(I*4)		38*	40	41	43	44	45	46	48	49	95*	98	100
			101	126*	128	129	130	134	135	136	137	138	139	140
			145*	147	148	149	153	154	155	156	157	160?	161?	201
			218*	219	221	222	225	226?	228?	229	230	231	232	233
			234	235	339*	341	342	343	345	348	349	350	351	352
			353	354	355	356	357	358	377*	379	382	386*	388	389
			391	392	396*	397	398?							
JV	(I*4)		214*	215	216									
JVEH	(I*4)		266*	269	269	271	272	274	275	276	277	278	279	280
K	R*4	ARRAY UNSPM	30	260	161?									
KAX	(I*4)		42*	43	44	45	46	48	49	99*	100	101	131*	134
			135	136	137	138	139	140	150*	153	154	155	156	157
			160?	161?	223*	225	226?	228?	229	230	231	232	233	235
			344*	345	348	349	350	351	352	353	354	355	356	357
			369	380*	382	390*	391	392						
KDOLLY	(I*4)	ARRAY KEY	170	365										
KEY	(I*4)	ARRAY KEY	170	41	98	129	148	201	221	341	379	388		
KIJ	(I*4)		405*	406										
KK	(I*4)		246*	249	249	250								
KKL	(I*4)		192*	185	186									
KL	(I*4)		181*	182	183	194								
KPIN	R*4	ARRAY	30	130	245*	249*	251*	262	263					
KRS	R*4	ARRAY UNSPM	30	260	391									
KT	R*4	ARRAY TIRES	30	250										
KTON	R*4	ARRAY	30	150	73*	74*	75	76	207					
LSIDE	(I*4)		47*	49	49	132*	139	140	151*	160?	161?	224*	225	226?
			228?	229	230	231	232	233	235	346*	348			
M	R*4	ARRAY	30	110										
MCS	R*4	SPMASS	30	190	265									
MVEH	(I*4)	KEY	170	34	68	70	71	93	104	116	124	143	164	175
			176	210	239	240	321	374	395	401	424			
N	R*4	ARRAY TIRES	30	250										
NHT	(I*4)		375*	381*	385									
NOSPR	(I*4)	ARRAY SPRING	300											
NOTURN	(I*4)	ARRAY TURN	210											

NS	R*4	ARRAY	STATIC	30	240								
NTP	(I*4)	ARRAY	BRAKE	20C									
NUM	(I*4)	ARRAY	BRAKE	20C									
P	(R*4)	ARRAY	BOUT	32C									
PBAR	(R*4)	ARRAY	ECTOUT	27C	112*	122*	155	156	157	171	172	173	265	337	422
				427											
PH	(R*4)	ARRAY	SPMASS	19C	77										
PHIPAR	(R*4)	ARRAY	ECTOUT	27C	110*	120*	171?	172?	173?	199	225	254?	255?	265	274?
				275?	292	326?	327?	385?							
PHIDD	(R*4)	ARRAY		10D											
PIN	(R*4)			67*	68*	69	70	263							
PJ	(R*4)	ARRAY	SPMASS	19C											
PSIDD	(R*4)	ARRAY	CMACC	29C	336*	351									
PSIDEL	(R*4)	ARRAY	PIN	28C	35*	196*	198*	199	205?	330?	415?				
PSIDSQ	(R*4)			337*	348										
PTRD	(R*4)		BOUT	32C											
PW	(R*4)	ARRAY	SPMASS	19C											
PX	(R*4)	ARRAY	SPMASS	19C											
PZ	(R*4)	ARRAY	SPMASS	19C											
PO	(R*4)	ARRAY	BOUT	32C											
R	I*4			2D											
RCI	(R*4)	ARRAY	UNSPM	26C	101										
RJBEUS	(R*4)			322*											
RST	(R*4)	ARRAY	UNSPM	26C	225										
S	(R*4)	ARRAY	SPRING	30C											
SD	(R*4)	ARRAY	SPRING	30C											
SF	(R*4)	ARRAY	STATIC	24C	161?	356	357	366							
SIGN	(R*4)			94*	96*	100	125*	133*	139	140	144*	152*	153	160?	264*
				267*	271	272	274	275	280	338*	347*	350			
SINDEL	(R*4)			295*	296	298	300	311	313	363*	364	366	371		
SINGAM	(R*4)			293*	294	299	301								
SLIP	(R*4)	ARRAY	TIRES	25C											
SMS	(R*4)			154*	160?										
SMSD	(R*4)			159*	160?										
SNI	(R*4)	ARRAY	SPMASS	19C											
SPSI	(R*4)	ARRAY	TRANS	31C	327*	332	333	417	418						
SRAD	(R*4)	ARRAY	TIRES	25C											
SRS	(R*4)	ARRAY		9D	228?										
STZ	(R*4)	ARRAY		14D											
SYI	(R*4)	ARRAY	UNSPM	26C	48	153	357								
T	(R*4)	ARRAY	BOUT	32C	228?	366									
TALIGN	(R*4)	ARRAY	IOUT	7C	229?	233	235	364							
TD	(R*4)	ARRAY	TAND	18C	57	90	86	87	88	89	90	183	184	185	186
				189	190	282	285	287	310	311	312	313	364	366	369
				370											
TFORAX	(R*4)	ARRAY	PIN	28C	207*	298	299	300	301						
TFORAY	(R*4)	ARRAY	PIN	28C	79*	298	299	300	301	364*					
TFORAZ	(R*4)		PIN	29C	366*	367	368	369	370	371					
TFORBX	(R*4)	ARRAY	PIN	28C											
TFORBY	(R*4)	ARRAY	PIN	28C											
TFORBZ	(R*4)		PIN	28C											
THETA	(R*4)	ARRAY		14D	206*	277									
THETAX	(R*4)	ARRAY	SPRING	30C	137*	139	225	391							
TKPIN	(R*4)	ARRAY		13C	244*	250*	252*	262	263						
TLST	(R*4)	ARRAY	BOUT	32C											
TOCZ	(R*4)			92*											
TOL	(R*4)	ARRAY	SPMASS	19C	192	195	198	206	207	311	313	330	364	366	370
				371	415										

TONA	(R*4)	ARRAY		50	189*	191							
TONB	(R*4)	ARRAY		50	190*	191							
TONGLE	(R*4)	ARRAY		50	179*	192*	207?						
TONHA	(R*4)	ARRAY		150	77*	189	314	315					
TONHB	(R*4)	ARRAY		150	78*	190	316	317	366				
TQ	(R*4)	ARRAY	BRAKE	20C									
TRA	(R*4)	ARRAY	UFSPM	26C	139	140	233	350					
TSUM	(R*4)	ARRAY	TIRES	25C	216*	235*	281*	282*	283*	284*	285*	286*	312*
				313*	314*	315*	316*	317*	350*	352*	355*	357*	369*
				370*	371*	385*	392*	427					
TSUMSM	(R*4)	ARRAY		80									
TURNX	(R*4)	ARRAY	TURN	21C									
TURNY	(R*4)	ARRAY	TURN	21C									
TXKP	(R*4)	ARRAY		130	55*	59*	60*	64	65	66	85	250	257
				259	261	282	284						
TZ	(R*4)	ARRAY		120	213*	233*	287*	288*	310*	311*	336		
UBAR	(R*4)	ARRAY	ECTOUT	27C	111*	121*	155	156	157	169	422		
UU	(R*4)			155*	159								
VDD	(R*4)	ARRAY		60									
VJ	(R*4)	ARRAY	SPMASS	19C	427	428							
VKPIN	(R*4)	ARRAY		130	256*	258*	260*	263					
VM	(R*4)	ARRAY		100	36*	37	69	70	75	76	419	420	422
VTAX	(R*4)			183*	205								
VTAY	(R*4)			184*	205								
VTKPIN	(R*4)	ARRAY		130	257*	259*	261*	263					
VTONA	(R*4)	ARRAY		60									
VTONB	(R*4)	ARRAY		60									
VTONGL	(R*4)	ARRAY		60	205*	207							
VV	(R*4)			156*	158	179*	189	190	192	193*	247*	248*	249
				250	253*	254*	255*						
VW	(R*4)	ARRAY	SPMASS	19C	36	67	69	70	73	74	76	385	
V2AX	(R*4)			185*	205								
V2AY	(R*4)			186*	205								
W	I*4			20									
WHBS	(R*4)	ARRAY	SPMASS	19C									
WW	(R*4)			157*	159	177*	188*	189	190				
X	(R*4)			115	226?	228?							
XAXFOR	(R*4)	ARRAY	TIRES	25C	45*	345*	349*	353	364	366			
XBACK	(R*4)	ARRAY	ROADD	22C	84*	86*	88*	90*	330	415			
XBAR	(R*4)	ARRAY	ECTOUT	27C	109*	119*	154	189	190	249	250	320	329
				398?	400	414							
XDDCM	(R*4)	ARRAY	CMACC	29C	334*	348							
XDUM	(R*4)			298*	302	306	311	313	317				
XFRONT	(R*4)	ARRAY	ROADD	22C	83*	85*	87*	89*	330	415			
XKP	(R*4)	ARRAY		130	54*	57*	58*	61	62	63	84	249	256
				258	260	281	283						
XLOAD	(R*4)	ARRAY	SPRING	30C									
XMAPTY	(R*4)	ARRAY		140	80*								
XMOM	(R*4)		PIN	29C	265*	281	282						
XROAD	(R*4)			320*	330*	331?	400*	415*	416?				
XTP	(R*4)	ARRAY	BRAKE	20C									
XX	(R*4)	ARRAY	BRAKE	20C									
XXDUM	(R*4)			297*	303	307	315						
XXS	(R*4)	ARRAY		100	109*	154	156	157	226?	228?	352	398?	
Y	(R*4)	ARRAY		1	110	109	110	111	112	115	119	120	121
				122	135	136	137	139	183?	184?	185?	196?	256?
				257?	258?	259?	260	261	391	398?			
YAXFOR	(R*4)	ARRAY	TIRES	25C	46*	351*	352	354	355	364	366		

YDDCM	(R*4)	ARRAY CMACC	29C	335*	351			
YDUM	(R*4)		300*	304	30E	311	313	316
YROAD	(R*4)		329*	3312	414*	416?		
YS	(R*4)		153*	154	155	157		
YT	(R*4)	ARRAY TIRES	25C	139*				
YTD	(R*4)	ARRAY TIRES	25C	140*				
YTP	(R*4)	ARRAY BRAKE	20C					
YY	(R*4)	ARRAY BRAKE	20C					
YYDUM	(R*4)		301*	305	309	310	312	314
ZAXLE	(R*4)	ARRAY SPRING	30C	135*	139			
ZZJ	(R*4)	ARRAY CGLOC	23C	336				
ZO	(R*4)	ARRAY SPRING	30C					

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES			
10	50		42	47		
20	51		34	38	40	
30	56		52	53		
40	81		72			
50	82		71			
60	101		99			
70	102		93	95		
80	113		104	105		
90	123		116	117		
100	141		131	132		
110	142		124	126	128	
120	159					
130	162		150	151		
140	163		143	145	147	
150	170		165	168		
160	174		164			
170	194		187			
180	198		195			
190	199		197			
200	204		201			
210	208		176			
220	209		175			
230	217		214			
240	228		227			
250	236		224	234		
260	237		223			
270	238		210	218	219	
280	250		246			
290	263		243			
300	273		270			
310	280		266			
320	290		241			
330	318		240	289		
340	319		239			
350	332		328			
360	334		323			
370	350		346			
380	356					
390	364					
400	372		344	358	361	365
410	373		321	339	343	

420	383	380		
430	384	377		
440	393	390		
450	394	374	386	389
460	395	395	396	397
470	407	405		
480	408	403		
490	414	410		
500	417	413		
510	421	409		
520	423	401	421	
530	429	425		
540	430	424		

TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION

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  MTS          INTERNAL       ****  F T N T  F D Y ****
LINE NO.       STMT NO.       INPUT LISTING

2271.                    C                                                                      V1022710
2272.                    C   *** SUBROUTINE TANDEM ***                                          V1022720
2273.                    C                                                                      V1022730
2274.              1           SUBROUTINE TANDEM(IVEH, JSUS)                                    V1022740
2275.              2           INTEGER R, W                                                     V1022750
2276.              3           REAL*8 AXLE                                                      V1022760
2277.              4           REAL M, KT, NS, K, JA, NDELTA, KRS, MCS                          V1022770
2278.              5           DIMENSION NDELTA(4,2,2,2), XXS(4,2,2), ERZ(4,2,2)                V1022780
2279.              6           DIMENSION Y(112), DERY(112), SUSP(4,2), XBAR(4,3)                V1022790
2280.              7           COMMON /BOUT/ P(4,2,2,2), PO(4,2,2,2), ILST(4,2,2,2), T(4,2,2,2), V1022800
2281.                         1       PTRO                                                     V1022810
2282.              8           COMMON /TAND/ ESPLIT(4,2), ESHIFT(4,2), TD(4,2)                  V1022820
2283.              9           COMMON /SPRING/ S(4,2,2,2), SD(4,2,2,2), THETAX(4,2,2),          V1022830
2284.                         1       DTHAX(4,2,2), ZAXLE(4,2,2), DZAXLE(4,2,2), DV(4,2,2,2),  V1022840
2285.                         2       NOSPR(4,2,2,2,2), DEFSPR(320), FORSPR(320), ZO(4,2,2,2), V1022850
2286.                         3       XLOAD(4,2,2,2)                                           V1022860
2287.             10          COMMON /TURN/ NTURN(2,2), TURNX(50), TURNY(50), DELT(4,2,2,2)    V1022870
2288.             11          COMMON /PAGE/ NP, HEAD(20), R, W                                 V1022880
2289.             12          COMMON /TIRES/ SRAD(4,2,2,2), CALF(4,2,2,2), DTS(4,2,2,2),       V1022890
2290.                         1       KT(4,2,2,2), CS(4,2,2,2), N(4,2,2,2), CAT(4,2,2,2),      V1022900
2291.                         2       YT(4,2,2,2), YTD(4,2,2,2), TSUM(4,3), XAXFOR(4,2,2),     V1022910
2292.                         3       YAXFOR(4,2,2), EYI(4,2,2,2), EXI(4,2,2,2), EXW(4,2,2,2), V1022920
2293.                         4       EYW(4,2,2,2), ALFERM(4,2,2,2), SLIP(4,2,2,2)             V1022930
2294.             13          COMMON /SPMASS/ WHBS(4), BEI(4), A3(4), APHI(4), DELTA(4), VW(4), V1022940
2295.                         1       VJ(4,3), PW(4), PX(4), PZ(4), EJ(4,3), SNL(4,2), D(4),   V1022950
2296.                         2       PH(4), TCL(4), MCS                                       V1022960
2297.             14          COMMON /KEY/ MVEH, KEY(4,2), KDOLLY(4)                           V1022970
2298.             15          COMMON /STATIC/ NS(4,2,2), ET(4), SE(4,2,2,2)                    V1022980
2299.             16          COMMON /UNSPM/ K(4,2,2,2), C(4,2,2,2), JA(4,2,2), PCI(4,2,2),    V1022990
2300.                         1       SYI(4,2,2), TRA(4,2,2), ASW(4,2,2), ASM(4,2,2),          V1023000
2301.                         2       AXDELT(4,2,2), RSI(4,2,2), KRS(4,2,2), AUXROL(4,2,2),    V1023010
2302.                         3       CF(4,2,2,2)                                              V1023020
2303.             17          COMMON /CGLOC/ AI(4,2,2), BX(4,2,2), ZZJ(4)                      V1023030
2304.             18          DIMENSION VEH(2,3), TIRES(3,2), SIDE(3,2), AXLE(3,2)             V1023040
2305.             19          DATA VEH /' TRA', 'CTOR', ' TRA', 'ILER', ' TRU', 'CK  '/         V1023050
2306.             20          DATA TIRES /' ERC', 'NT T', 'IRES', ' REA', 'R TI', 'RES'/        V1023060
2307.             21          DATA SIDE /'LEFT', ' SID', 'E   ', 'RIGH', 'T SI', 'DE  '/       V1023070
2308.             22          DATA AXLE /'LEADING ', 'TANDEM A', 'XLE     ', 'TRAILING',       V1023080
2309.                         1     ' TANDEM ', 'AXLE    '/                                    V1023090
2310.             23          DATA SUSP /'EPON', 'T SU', 'SPEN', 'SION', 'REAR', ' SUS', 'PENS',V1023100
2311.                         1     'ION '/                                                    V1023110
2312.                    C                                                                      V1023120
2313.                    C   INITIALIZE CONSTANTS                                             V1023130
2314.                    C                                                                      V1023140
2315.             24          RKEY = 1.                                                        V1023150
2316.             25          RADIAN = 57.2957795                                              V1023160
2317.                    C                                                                      V1023170
2318.                    C   SUSPENSION AND AXLE PARAMETERS                                    V1023180
2319.                    C                                                                      V1023190
2320.             26          IF (IVEH .GT. 2 .AND. JSUS .EQ. 1) READ (R,110) KEY(IVEH,JSUS)   V1023200
2321.             27          IF (JSUS .EQ. 2) READ (R,110) KEY(IVEH,JSUS)                     V1023210
2322.             28          IF (KEY(IVEH,JSUS) .EQ. 0) GO TO 10                              V1023220
2323.             29          READ (R,100) TD(IVEH,JSUS)                                       V1023230
2324.             30          READ (R,100) ESPLIT(IVEH,JSUS)                                   V1023240
2325.             31          READ (R,100) ESHIFT(IVEH,JSUS)                                   V1023250
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MTS LINE NO.   INTERNAL STMT NO.   **** P R I N T E D Y ****  INPUT LISTING

2326.                 32          10 CONTINUE                                                                    V1023260
2327.                 33             JKK = 1                                                                     V1023270
2328.                 34             IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                                          V1023280
2329.                 35             DO 50 KAX = 1, JKK                                                          V1023290
2330.                 36               READ (R,120) (K(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2)                          V1023300
2331.                 37               IF (K(IVEH,JSUS,KAX,2) .EQ. 0.) K(IVEH,JSUS,KAX,2) = K(IVEH,             V1023310
2332.                   1   JSUS,KAX,1)                                                                          V1023320
2333.                       C                                                                                    V1023330
2334.                       C    SPRING TABLE LOOK-UP - COMPRESSION IS POSITIVE                                  V1023340
2335.                       C                                                                                    V1023350
2336.                 38             DO 40 LSIDE = 1, 2                                                          V1023360
2337.                 39               IF (K(IVEH,JSUS,KAX,LSIDE) .GE. 0.) GO TO 40                              V1023370
2338.                 40               TN = K(IVEH,JSUS,KAX,LSIDE)                                               V1023380
2339.                 41               CALL TABDIR(TN, IVEH, JSUS, KAX, LSIDE, IV, JS, KA, LS, YN, 1)            V1023390
2340.                 42               IF (YN .EQ. 0.) GO TO 20                                                  V1023400
2341.                 43               NOSPR(IVEH,JSUS,KAX,LSIDE,1) = NOSPR(IV,JS,KA,LS,1)                       V1023410
2342.                 44               NOSPR(IVEH,JSUS,KAX,LSIDE,2) = NOSPR(IV,JS,KA,LS,2)                       V1023420
2343.                 45               GO TO 40                                                                  V1023430
2344.                 46          20   CONTINUE                                                                  V1023440
2345.                 47               IK = 80 * (IVEH - 1) + 40 * (JSUS - 1) + 20 * (KAX - 1) + 10 *            V1023450
2346.                   1                (LSIDE - 1) + 1                                                         V1023460
2347.                 48               NOSPR(IVEH,JSUS,KAX,LSIDE,1) = IK                                         V1023470
2348.                 49               READ (R,110) NUR                                                          V1023480
2349.                 50               NOSPR(IVEH,JSUS,KAX,LSIDE,2) = IK + NUR - 1                               V1023490
2350.                 51               IKK = NOSPR(IVEH,JSUS,KAX,LSIDE,2)                                        V1023500
2351.                 52               DO 30 II = IK, IKK                                                        V1023510
2352.                 53          30   READ (R,130) FORSPR(II), DEFSPR(II)                                       V1023520
2353.                 54          40   CONTINUE                                                                  V1023530
2354.                 55               READ (R,120) (C(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2)                           V1023540
2355.                 56               IF (C(IVEH,JSUS,KAX,2) .EQ. 0.) C(IVEH,JSUS,KAX,2) = C(IVEH,              V1023550
2356.                   1   JSUS,KAX,1)                                                                          V1023560
2357.                 57               READ (R,120) (CF(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2)                          V1023570
2358.                 58               IF (CF(IVEH,JSUS,KAX,2) .EQ. 0.) CF(IVEH,JSUS,KAX,2) = CF(IVEH,           V1023580
2359.                   1   JSUS,KAX,1)                                                                          V1023590
2360.                 59               READ (R,100) JA(IVEH,JSUS,KAX)                                            V1023600
2361.                 60               READ (R,100) RCI(IVEH,JSUS,KAX)                                           V1023610
2362.                 61               READ (R,100) RST(IVEH,JSUS,KAX)                                           V1023620
2363.                 62               READ (R,100) KRS(IVEH,JSUS,KAX)                                           V1023630
2364.                 63               READ (R,100) SYI(IVEH,JSUS,KAX)                                           V1023640
2365.                 64               READ (R,100) TRA(IVEH,JSUS,KAX)                                           V1023650
2366.                 65               READ (R,100) ASW(IVEH,JSUS,KAX)                                           V1023660
2367.                 66          50 CONTINUE                                                                    V1023670
2368.                       C                                                                                    V1023680
2369.                       C    ECHO                                                                            V1023690
2370.                       C                                                                                    V1023700
2371.                 67             ITN = IVEH - 1                                                            V1023710
2372.                 68             IV = 1                                                                    V1023720
2373.                 69             IF (MVEH .EQ. 1) IV = 3                                                   V1023730
2374.                 70             IF (IVEH .GE. 2) IV = 2                                                   V1023740
2375.                 71             IF (KEY(IVEH,JSUS) .GT. 0) GO TO 60                                       V1023750
2376.                 72             IF (IVEH .EQ. 1) WRITE (W,130) (VEH(IJ,IV),IJ=1,2),                       V1023760
2377.                               1(SUSP(IJ,JSUS),IJ=1,4), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)                     V1023770
2378.                 73             IF (IVEH .GT. 1) WRITE (W,140) (VEH(IJ,IV),IJ=1,2), ITN,                  V1023780
2379.                               1(SUSP(IJ,JSUS),IJ=1,4), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)                     V1023790
2380.                 74             IF (JSUS .EQ. 2 .OR. IVEH .GT. 2) WRITE (W,170) KEY(IVEH,JSUS)            V1023800
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2391.    75          WRITE (W,220) (K(IVEH,JSUS,1,LSIDE),LSIDE=1,2)                                  V1023810
2392.    76          IF (K(IVEH,JSUS,1,1) .LT. 0. .OR. K(IVEH,JSUS,1,2) .LT. 0.)                    V1023820
2393.               1       WRITE (W,23))                                                           V1023830
2394.    77          WRITE (W,250) (C(IVEH,JSUS,1,LSIDE),LSIDE=1,2)                                  V1023840
2395.    78          WRITE (W,410) (CF(IVEH,JSUS,1,LSIDE),LSIDE=1,2)                                 V1023850
2396.    79          WRITE (W,430)                                                                   V1023860
2397.    80          WRITE (W,270) JA(IVEH,JSUS,1)                                                   V1023870
2398.    81          WRITE (W,290) RCI(IVEH,JSUS,1)                                                  V1023880
2399.    82          WRITE (W,310) RST(IVEH,JSUS,1)                                                  V1023890
2400.    83          WRITE (W,330) KRS(IVEH,JSUS,1)                                                  V1023900
2401.    84          WRITE (W,350) SYI(IVEH,JSUS,1)                                                  V1023910
2402.    85          WRITE (W,370) TRA(IVEH,JSUS,1)                                                  V1023920
2403.    86          WRITE (W,390) ASW(IVEH,JSUS,1)                                                  V1023930
2404.    87          GO TO 70                                                                        V1023940
2405.    88      60 CONTINUE                                                                         V1023950
2406.    89          IF (IVEH .EQ. 1) WRITE (W,150) (VEH(IJ,IV),IJ=1,2),                             V1023960
2407.               1(SUSP(IJ,JSUS),IJ=1,4), ((AXLE(IJ,IK),IJ=1,3),IK=1,2),                         V1023970
2408.               2((SIDE(IJ,IK),IJ=1,3),IK=1,2), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)                   V1023980
2409.    90          IF (IVEH .GT. 1) WRITE (W,160) (VEH(IJ,IV),IJ=1,2), ITN,                        V1023990
2410.               1(SUSP(IJ,JSUS),IJ=1,4), ((AXLE(IJ,IK),IJ=1,3),IK=1,2),                         V1024000
2411.               2((SIDE(IJ,IK),IJ=1,3),IK=1,2), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)                   V102401C
2412.    91          IF (JSUS .EQ. 2 .OR. IVEH .GT. 2) WRITE (W,180) KEY(IVEH,JSUS)                  V1024020
2413.    92          WRITE (W,190) ID(IVEH,JSUS)                                                     V1024030
2414.    93          WRITE (W,200) FSPLIT(IVEH,JSUS)                                                 V1024040
2415.    94          WRITE (W,210) FSHIFT(IVEH,JSUS)                                                 V1024050
2416.    95          WRITE (W,240) ((K(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2),KAX=1,2)                      V1024060
2417.    96          IF (K(IVEH,JSUS,1,1) .LT. 0. .OR. K(IVEH,JSUS,1,2) .LT. 0. .OR. K(             V1024070
2418.               1       IVEH,JSUS,2,1) .LT. 0. .OR. K(IVEH,JSUS,2,2) .LT. 0.)                   V1024080
2419.               2       WRITE (W,23))                                                           V1024090
2420.    97          WRITE (W,260) ((C(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2),KAX=1,2)                      V1024100
2421.    98          WRITE (W,420) ((CF(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2),KAX=1,2)                     V1024110
2422.    99          WRITE (W,440)                                                                   V1024120
2423.   100          WRITE (W,280) (JA(IVEH,JSUS,KAX),KAX=1,2)                                       V1024130
2424.   101          WRITE (W,300) (RCI(IVEH,JSUS,KAX),KAX=1,2)                                      V1024140
2425.   102          WRITE (W,320) (RST(IVEH,JSUS,KAX),KAX=1,2)                                      V1024150
2426.   103          WRITE (W,340) (KRS(IVEH,JSUS,KAX),KAX=1,2)                                      V102416C
2427.   104          WRITE (W,360) (SYI(IVEH,JSUS,KAX),KAX=1,2)                                      V1024170
2428.   105          WRITE (W,380) (TRA(IVEH,JSUS,KAX),KAX=1,2)                                      V102418C
2429.   106          WRITE (W,400) (ASW(IVEH,JSUS,KAX),KAX=1,2)                                      V1024190
2430.   107      70 CONTINUE                                                                         V1024200
2431.              C                                                                                V1024210
2432.              C   UNIT CONVERSIONS                                                             V1024220
2433.              C                                                                                V1024230
2434.   108          DO 90 KAX = 1, JKK                                                              V1024240
2435.   109            DO 80 LSIDE = 1, 2                                                            V1024250
2436.   110              IF (K(IVEH,JSUS,KAX,LSIDE) .GT. 0.) K(IVEH,JSUS,KAX,LSIDE) =               V1024260
2437.               1     K(IVEH,JSUS,KAX,LSIDE) * 12.                                              V1024270
2438.   111              C(IVEH,JSUS,KAX,LSIDE) = C(IVEH,JSUS,KAX,LSIDE) * 12.                      V1024280
2439.   112        80    CONTINUE                                                                    V1024290
2440.   113          JA(IVEH,JSUS,KAX) = JA(IVEH,JSUS,KAX) / 12.                                     V1024300
2441.   114          RCI(IVEH,JSUS,KAX) = RCI(IVEH,JSUS,KAX) / 12.                                   V1024310
2442.   115          SYI(IVEH,JSUS,KAX) = SYI(IVEH,JSUS,KAX) / 12. / 2.                              V102432C
2443.   116          TRA(IVEH,JSUS,KAX) = TRA(IVEH,JSUS,KAX) / 12. / 2.                              V1024330
2444.   117          KRS(IVEH,JSUS,KAX) = KRS(IVEH,JSUS,KAX) * 57. / 12.                             V1024340
2445.   118        90 CONTINUE                                                                       V1024350
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  MTS          INTERNAL       **** E N T R Y ****
LINE NO.       STMT NO.       INPUT LISTING

2436.            119            TD(IVEH,JSUS) = TD(IVEH,JSUS) / 12.                                    V1C2436C
2437.            120            RETURN                                                                 V1024370
2438.                     C                                                                            V1024380
2439.                     C   FORMATS                                                                  V1024390
2440.                     C                                                                            V1024400
2441.            121          100 FORMAT (F15.3)                                                       V1024410
2442.            122          110 FORMAT (I2)                                                          V1024420
2443.            123          120 FORMAT (2F10.2)                                                      V1024430
2444.            124          130 FORMAT ('0', T4, 2A4, 1X, 4A4, ' AND AXLE PARAMETERS', T90, 3A4,     V1024440
2445.                            1       T110, 3A4/T5, '-----------------------------------------V1024450
2446.                            2-', T90, '---------', T110, '----------'/)                          V1024460
2447.            125          140 FORMAT ('0', T4, 2A4, ' NO.', I2, 1X, 4A4, ' AND AXLE PARAMETERS',V1024470
2448.                            1       T90, 3A4, T110, 3A4/T5, '-----------------------------V1024480
2449.                            2----------', T90, '---------', T110, '----------'/)                 V1024490
2450.            126          150 FORMAT ('0', T4, 2A4, 1X, 4A4, ' AND AXLE PARAMETERS', T75, 3A8,     V1024500
2451.                            1       T105, 3A8/T5, '-----------------------------------------V1024510
2452.                            2-', T75, '-----------------------', T105, '---------------------V1024520
2453.                            3--'/T74, 3A4, 3A4, T105, 3A4, 3A4/T74, '---------', 3X,             V1024530
2454.                            4       '----------', T105, '---------', 3X, '----------'/)          V1024540
2455.            127          160 FORMAT ('0', T4, 2A4, ' NO.', I2, 1X, 4A4, ' AND AXLE PARAMETERS',V1024550
2456.                            1       T75, 3A8, T105, 3A8/T5, '-----------------------------V1024560
2457.                            2----------', T75, '-----------------------', T105,                  V1024570
2458.                            3       '-----------------------'/T74, 3A4, 3A4, T105, 3A4,          V1024580
2459.                            4       3A4/T74, '---------', 3X, '----------', T105, '---------', V1024590
2460.                            5       3X, '----------'/)                                           V1024600
2461.            128          170 FORMAT (' ', T10, 'SUSPENSION KEY - 0 INDICATES SINGLE AXLE, 1',     V1024610
2462.                            1       ' INDICATES TANDEM AXLES', T93, I10)                         V1024620
2463.            129          180 FORMAT (' ', T10, 'SUSPENSION KEY - 0 INDICATES SINGLE AXLE, 1',     V1024630
2464.                            1       ' INDICATES TANDEM AXLES', T93, I10)                         V1024640
2465.            130          190 FORMAT (' ', T15, 'TANDEM AXLE SEPARATION (IN BETWEEN LEADING AND'   V1024650
2466.                            1       , ' TRAILING AXLES)', T93, F10.2)                            V1024660
2467.            131          200 FORMAT (' ', T15, 'STATIC LOAD TRANSFER (PERCENT LOAD ON LEAD AXLE)V1024670
2468.                            1', T93, F10.2)                                                      V1024680
2469.            132          210 FORMAT (' ', T15, 'DYNAMIC LOAD TRANSFER (PERCENT OF BRAKE TORQUE V1024690
2470.                            1', 'TRANSFERRED ONTO LEADING AXLE)', T98, F5.2)                     V1024700
2471.            133          220 FORMAT (' ', T10, 'SUSPENSION SPRING RATE (LB/IN/SIDE/AXLE)', T89,V1024710
2472.                            1       F10.2, T110, F10.2)                                          V1024720
2473.            134          230 FORMAT (' ', T15, '*** NEGATIVE ENTRY INDICATES TABLE ENTERED ***'V1024730
2474.                            1       /T15, '*** ECHO WILL APPEAR ON TABLE INDEX PAGE ***')        V1024740
2475.            135          240 FORMAT (' ', T10, 'SUSPENSION SPRING RATE (LB/IN/SIDE/AXLE)', T73,V1024750
2476.                            1       F10.2, 3X, F10.2, T105, F10.2, 3X, F10.2)                    V1024760
2477.            136          250 FORMAT (' ', T10, 'SUSPENSION VISCOUS DAMPING (LB-SEC/IN/SIDE',      V1024770
2478.                            1       '/AXLE)', T89, F10.2, T110, F10.2)                           V1024780
2479.            137          260 FORMAT (' ', T10, 'SUSPENSION VISCOUS DAMPING (LB-SEC/IN/SIDE',      V1024790
2480.                            1       '/AXLE)', T73, F10.2, 3X, F10.2, T105, F10.2, 3X, F10.2)     V1024800
2481.            138          270 FORMAT (' ', T10, 'AXLE ROLL MOMENT OF INERTIA (IN-LB-SEC**2)',      V1024810
2482.                            1       T95, F15.2)                                                  V1024820
2483.            139          280 FORMAT (' ', T10, 'AXLE ROLL MOMENT OF INERTIA (IN-LB-SEC**2)',      V1024830
2484.                            1       T73, F15.2, T110, F15.2)                                     V1024840
2485.            140          290 FORMAT (' ', T10, 'ROLL CENTER HEIGHT (IN. ABOVE GROUND)', T95,      V1024850
2486.                            1       F15.2)                                                       V1024860
2487.            141          300 FORMAT (' ', T10, 'ROLL CENTER HEIGHT (IN. ABOVE GROUND)', T73,      V1024870
2488.                            1       F15.2, T110, F15.2)                                          V1024880
2489.            142          310 FORMAT (' ', T10, 'ROLL STEER COEFFICIENT (DEG. STEER/DEG. ROLL)',V1024890
2490.                            1       T95, F15.2)                                                  V1024900
```

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   MTS          INTERNAL       ****  F T A T I C Y ****
LINE NO.        STMT NO.       INPUT LISTING

2491.             143       320 FORMAT (' ', T10, 'ROLL STEER COEFFICIENT (DEG. STEER/DEG. ROLL)',VL024910
2492.                          1       T73, F15.2, T11), F15.2)                                    VL024920
2493.             144       330 FORMAT (' ', T10, 'AUXILIARY ROLL STIFFNESS (IN-LB/DEG/AXLE)',    VL024930
2494.                          1       T95, F15.2)                                                 VL024940
2495.             145       340 FORMAT (' ', T10, 'AUXILIARY ROLL STIFFNESS (IN-LB/DEG/AXLE)',    VL02495C
2496.                          1       T73, F15.2, T110, F15.2)                                    VL024960
2497.             146       350 FORMAT (' ', T10, 'LATERAL DISTANCE BETWEEN SUSPENSION SPRINGS (INVL02497C
2498.                          1)', T95, F15.2)                                                    VL024980
2499.             147       360 FORMAT (' ', T10, 'LATERAL DISTANCE BETWEEN SUSPENSION SPRINGS (INVL024990
2500.                          1)', T73, F15.2, T110, F15.2)                                       VL025000
2501.             148       370 FORMAT (' ', T10, 'TRACK WIDTH (IN)', T95, F15.2)                 VL025010
2502.             149       380 FORMAT (' ', T10, 'TRACK WIDTH (IN)', T73, F15.2, T110, F15.2)    VL025020
2503.             150       390 FORMAT (' ', T10, 'UNSPRUNG WEIGHT (LB)', T95, F15.2)             VL025030
2504.             151       400 FORMAT (' ', T10, 'UNSPRUNG WEIGHT (LB)', T73, F15.2, T110, F15.2)VL025040
2505.             152       410 FORMAT (' ', T10, 'COULOMB FRICTION (LB/SIDE/AXLE)', T89, F10.2,  VL02505C
2506.                          1       T110, F10.2)                                                VL025060
2507.             153       420 FORMAT (' ', T10, 'COULOMB FRICTION (LB/SIDE/AXLE)', T73, F10.2,  VL025070
2508.                          1       3X, F10.2, T105, F10.2, 3X, F10.2)                          VL02508C
2509.             154       430 FORMAT (' ', T9C, '-----------------------------------')          VL025090
2510.             155       440 FORMAT (' ', T74, '-----------------------------------------------VL025100
2511.                          1', '--------')                                                     VL025110
2512.                   C                                                                         VL025120
2513.             156           ENTRY TANDIN(IVEH,JSUS,KAX,LSIDE,SMS,SMSD,SIGN)                   VL025130
2514.             157           SDUMB = ZAXLE(IVEH,JSUS,KAX) + SIGN * SYI(IVEH,JSUS,KAX) * THETAX(VL025140
2515.                          IVEH,JSUS,KAX)                                                      VL025150
2516.             158           DSDUMB = DZAXLE(IVEH,JSUS,KAX) + SIGN * SYI(IVEH,JSUS,KAX) *       VL02516C
2517.                          1DTHAX(IVEH,JSUS,KAX)                                               VL025170
2518.             159           S(IVEH,JSUS,KAX,LSIDE) = SDUMB - SMS                               VL025180
2519.             160           SD(IVEH,JSUS,KAX,LSIDE) = DSDUMB - SMSD                            VL025190
2520.             161           RETURN                                                             VL025200
2521.                   C                                                                         VL025210
2522.             162           ENTRY TANDYN(IVEH,JSUS,Y,DERY,XBAR,XXS,FRZ)                        VL025220
2523.             163           JKK = 1                                                            VL025230
2524.             164           IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                                 VL025240
2525.             165           DO 450 KAX = 1, JKK                                                VL025250
2526.             166             IA = (IVEH - 1) * 28 + (JSUS - 1) * 8 + (KAX - 1) * 4 + 13       VL025260
2527.             167             DERY(IA) = Y(IA + 1)                                             VL025270
2528.             168             DERY(IA + 1) = (NS(IVEH,JSUS,KAX) - N(IVEH,JSUS,KAX,1) - N(IVEH,VL025280
2529.                          1  JSUS,KAX,2) - SF(IVEH,JSUS,KAX,1) - SF(IVEH,JSUS,KAX,2)) / ASM(  VL025290
2530.                          2  IVEH,JSUS,KAX)                                                   VL025300
2531.             169             IF (ABS(DERY(IA + 1)) .LT. 0.001) DERY(IA + 1) = 0.0             VL025310
2532.             170             DERY(IA + 2) = Y(IA + 3)                                         VL025320
2533.             171             DERY(IA + 3) = ((N(IVEH,JSUS,KAX,1) - N(IVEH,JSUS,KAX,2))*TRA(   VL025330
2534.                          1  IVEH,JSUS,KAX) + (SF(IVEH,JSUS,KAX,1) - SF(IVEH,JSUS,KAX,2))*   VL025340
2535.                          2  SYI(IVEH,JSUS,KAX) - FYI(IVEH,JSUS,KAX,1)*SRAD(IVEH,JSUS,KAX,1) VL025350
2536.                          3  - FYI(IVEH,JSUS,KAX,2)*SRAD(IVEH,JSUS,KAX,2) - (YAXFOR(IVEH,     VL025360
2537.                          4  JSUS,KAX)*COS(DELT(IVEH,JSUS,KAX,1)) - XAXFOR(IVEH,JSUS,KAX)*   VL025370
2538.                          5  SIN(DELT(IVEH,JSUS,KAX,1)))*(RCI(IVEH,JSUS,KAX) - SRAD(IVEH,     VL025380
2539.                          6  JSUS,KAX,1))) / JA(IVEH,JSUS,KAX) - ALXREL(IVEH,JSUS,KAX) / JA(  VL025390
2540.                          7  IVEH,JSUS,KAX)                                                   VL025400
2541.             172         450 CONTINUE                                                         VL025410
2542.                   C                                                                         VL025420
2543.                   C                                                                         VL025430
2544.             173           TSUM(IVEH,2) = TSUM(IVEH,2) - (SF(IVEH,JSUS,1,1) + SF(IVEH,JSUS,1,VL025440
2545.                          12)) * XXS(IVEH,JSUS,1) + XAXFOR(IVEH,JSUS,1) * FRZ(IVEH,JSUS,1) + VL025450
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   MTS          INTERNAL      ****  F I N T I D Y ****
LINE NO.        STMT NO.      INPUT LISTING

2546.                        2XAXEQP(IVEH,JSUS,2) * FRZ(IVEH,JSUS,2) - (SF(IVEH,JSUS,2,1) + SF( V1025460
2547.                        3IVEH,JSUS,2,2)) * XXS(IVEH,JSUS,2) - (1 + FSHIFT(IVEH,JSUS)) * (T( V1025470
2548.                        4IVEH,JSUS,1,1) + T(IVEH,JSUS,1,2) + T(IVEH,JSUS,2,1) + T(IVEH,     V1025480
2549.                        5JSUS,2,2))                                                         V1025490
2550.           174          RETURN                                                              V1025500
2551.           175          END                                                                 V1025510
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES
ABS	(R*4)	FCN	165
COS	R*4	FCN	171
SIN	(R*4)	FCN	171
TABDIR		SUBR	41
TANDEM		SUBR	10
TANDIN	(R*4)	ENTRY	1560
TANDYN	(R*4)	ENTRY	1620
<EXIT>		SUBR	120 161 174

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES
ALFRM	(R*4)	ARRAY	TIRES	120
APHI	(R*4)	ARRAY	SPMASS	130
ASM	(R*4)	ARRAY	UNSPM	160 168
ASW	(R*4)	ARRAY	UNSPM	160 65* 86 106
AUXROL	(R*4)	ARRAY	UNSPM	160 171
AXDELT	(R*4)	ARRAY	UNSPM	160
AXLE	R*8	ARRAY		30 180 22 . 89 90
A1	(R*4)	ARRAY	CGLOC	170
A3	(R*4)	ARRAY	SPMASS	130
BBI	(R*4)	ARRAY	SPMASS	130
BX	(R*4)	ARRAY	CGLOC	170
C	(R*4)	ARRAY	UNSPM	160 55* 56* 77 97 111*
CALF	(R*4)	ARRAY	TIRES	120
CAT	(R*4)	ARRAY	TIRES	120
CF	(R*4)	ARRAY	UNSPM	160 57* 58* 78 98
CS	(R*4)	ARRAY	TIRES	120
D	(R*4)	ARRAY	SPMASS	130
DEFSPR	(R*4)	ARRAY	SPRING	90 53*
DELT	(R*4)	ARRAY	TURN	100 171?
DELTA	(R*4)	ARRAY	SPMASS	130
DERY	(R*4)	ARRAY		60 162 167* 168* 169* 170* 171*
DSDUMP	(R*4)			158* 160
DTHAX	(R*4)	ARRAY	SPRING	90 158
DTS	(R*4)	ARRAY	TIRES	120
DV	(R*4)	ARRAY	SPRING	90
DZAXLE	(R*4)	ARRAY	SPRING	90 158
FORSPR	(R*4)	ARRAY	SPRING	90 53*
FRZ	(R*4)	ARRAY		50 162 173
FSHIFT	(R*4)	ARRAY	TAND	80 31* 94 173
FSPLIT	(R*4)	ARRAY	TAND	80 30* 93
FT	(R*4)	ARRAY	STATIC	150
FXI	(R*4)	ARRAY	TIRES	120
FXW	(R*4)	ARRAY	TIRES	120
FYI	(R*4)	ARRAY	TIRES	120 171
FYW	(R*4)	ARRAY	TIRES	120
HEAD	(R*4)	ARRAY	PAGE	110
IA	(I*4)			166* 167 169 169 170 171
II	(I*4)			52* 53
IJ	(I*4)			72* 73* 89* 90*
IK	(I*4)			47* 48 50 52 72* 73* 89* 90*
IKK	(I*4)			51* 52

ITN	(I*4)			67*	73	90							
IV	(I*4)			41?	43	44	68*	69*	70*	72	73	89	90
IVEH	(I*4)			1	26	27	28	29	30	31	34	36	37
				41?	43	44	47	48	50	51	55	56	57
				60	61	62	63	64	65	67	70	71	72
				75	76	77	78	80	81	82	83	84	85
				90	91	92	93	94	95	96	97	98	100
				103	104	105	106	110	111	113	114	115	116
				156	157	158	159	160	162	164	166	169	171
JA	R*4	ARRAY	UNSPM	40	150	55*	80	100	113*	171			
JKK	(I*4)			33*	34*	35	108	163*	164*	165			
JS	(I*4)			41?	43	44							
JSUS	(I*4)			1	26	27	28	29	30	31	34	36*	37
				41?	43	44	47	48	50	51	55*	56	57*
				60*	61*	62*	63*	64*	65*	71	72	73	74
				77	78	80	81	82	83	84	85	86	89
				92	93	94	95	96	97	98	100	101	102
				105	106	110	111	113	114	115	116	117	119
				158	159	160	162	164	166	168	171	173	
K	R*4	ARRAY	UNSPM	40	160	36*	37*	39	40	75	76	95	96
KA	(I*4)			41?	43	44							
KAX	(I*4)			35*	36*	37	39	40	41?	43	44	47	48
				55*	56	57*	58	59	60	61	62	63	64
				97*	98*	100*	101*	102*	103*	104*	105*	106*	108*
				113	114	115	116	117	156	157	158	159	160
				168	171								
KDOLLY	(I*4)	ARRAY	KEY	140									
KEY	(I*4)	ARRAY	KEY	140	26*	27*	28	34	71	74	91	164	
KRS	R*4	ARRAY	UNSPM	40	160	62*	93	103	117*				
KT	R*4	ARRAY	TIRES	40	120								
LS	(I*4)			41?	43	44							
LSIDE	(I*4)			36*	38*	39	40	41?	43	44	47	48	50
				57*	75*	77*	78*	95*	97*	98*	109*	110	111
				160									
MCS	R*4		SPMASS	40	130								
MVEH	(I*4)		KEY	140	69								
N	R*4	ARRAY	TIRES	40	120	168	171						
NDELTA	R*4	ARRAY		40	50								
NOSPR	(I*4)	ARRAY	SPRING	90	43*	44*	48*	50*	51				
NOTURN	(I*4)	ARRAY	TURN	100									
NP	(I*4)		PAGE	110									
NS	R*4	ARRAY	STATIC	40	150	168							
NUB	(I*4)			49	50								
P	(R*4)	ARRAY	BOUT	70									
PH	(R*4)	ARRAY	SPMASS	130									
PJ	(R*4)	ARRAY	SPMASS	130									
PTRD	(R*4)		BOUT	70									
PW	(R*4)	ARRAY	SPMASS	130									
PX	(R*4)	ARRAY	SPMASS	130									
PZ	(R*4)	ARRAY	SPMASS	130									
PO	(R*4)	ARRAY	BOUT	70									
R	I*4		PAGE	20	110	26R	27R	29R	30R	31R	36R	49R	53R
				55R	60R	61R	62R	63R	64R	65R			
RADIAN	(R*4)			25*									
RCI	(R*4)	ARRAY	UNSPM	160	60*	81	101	114*	171				
RKEY	(R*4)			24*									
RST	(R*4)	ARRAY	UNSPM	160	61*	82	102						
S	(R*4)	ARRAY	SPRING	90	159*								

SD	(R*4)	ARRAY SPRING	9C	160*								
SDUMB	(R*4)		157*	159								
SF	(R*4)	ARRAY STATIC	15C	169	171	173						
SIDE	(R*4)	ARRAY	18D	21	72	73	89	90				
SIGN	(R*4)		156	157	158							
SLIP	(R*4)	ARRAY TIRES	12C									
SMS	(R*4)		156	159								
SMSD	(R*4)		156	160								
SNL	(R*4)	ARRAY SPMASS	13C									
SRAD	(R*4)	ARRAY TIRES	12C	171								
SUSP	(R*4)	ARRAY	6D	23	72	73	89	90				
SYI	(R*4)	ARRAY UNSPM	16C	63*	84	104	115*	157	158	171		
T	(R*4)	ARRAY BOUT	7C	173								
TD	(R*4)	ARRAY TAND	9C	29*	92	119*						
THETAX	(R*4)	ARRAY SPRING	9C	157								
TIRES	(R*4)	ARRAY	18D	20								
TLST	(R*4)	ARRAY BOUT	7C									
TN	(R*4)		40*	41?								
TOL	(R*4)	ARRAY SPMASS	13C									
TRA	(R*4)	ARRAY UNSPM	16C	64*	85	105	116*	171				
TSUM	(R*4)	ARRAY TIRES	12C	173*								
TURNX	(R*4)	ARRAY TURN	10C									
TURNY	(R*4)	ARRAY TURN	10C									
VEH	(R*4)	ARRAY	18D	19	72	73	89	90				
VJ	(R*4)	ARRAY SPMASS	13C									
VW	(R*4)	ARRAY SPMASS	13C									
W	I*4	PAGE	2D	11C	72W	73W	74W	75W	76W	77W	78W	79W
			82W	83W	84W	85W	86W	89W	90W	91W	92W	93W
			96W	97W	98W	99W	100W	101W	102W	103W	104W	105W
WHBS	(R*4)	ARRAY SPMASS	13C									
XAXEQR	(R*4)	ARRAY TIRES	12C	171	173							
XBAR	(R*4)	ARRAY	6D	162								
XLOAD	(R*4)	ARRAY SPRING	9C									
XXS	(R*4)	ARRAY	5C	162	173							
Y	(R*4)	ARRAY	6C	162	167	170						
YAXEQR	(R*4)	ARRAY TIRES	12C	171								
YN	(R*4)		41?	42								
YT	(R*4)	ARRAY TIRES	12C									
YTD	(R*4)	ARRAY TIRES	12C									
ZAXLE	(R*4)	ARRAY SPRING	9C	157								
ZZJ	(R*4)	ARRAY CGLOC	17C									
ZO	(R*4)	ARRAY SPRING	9C									
1			75	77	78							

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES								
10	32		28								
20	46		42								
30	53		52								
40	54		38	39	45						
50	65		35								
60	88		71								
70	107		87								
80	112		109								
90	118		108								
100	121	FMT	29	30	31	59	60	61	62	63	64	65

110	122	FMT	26	27	49	
120	123	FMT	36	53	55	57
130	124	FMT	72			
140	125	FMT	73			
150	126	FMT	89			
160	127	FMT	90			
170	128	FMT	74			
180	129	FMT	91			
190	130	FMT	92			
200	131	FMT	93			
210	132	FMT	94			
220	133	FMT	75			
230	134	FMT	76	96		
240	135	FMT	95			
250	136	FMT	77			
260	137	FMT	97			
270	138	FMT	80			
280	139	FMT	100			
290	140	FMT	81			
300	141	FMT	101			
310	142	FMT	82			
320	143	FMT	102			
330	144	FMT	83			
340	145	FMT	103			
350	146	FMT	84			
360	147	FMT	104			
370	148	FMT	85			
380	149	FMT	105			
390	150	FMT	86			
400	151	FMT	106			
410	152	FMT	78			
420	153	FMT	98			
430	154	FMT	79			
440	155	FMT	99			
450	172		165			

TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION

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  MTS          INTERNAL       **** F T N T I O Y ****
LINE NO.       STMT NO.       INPUT LISTING

2552.                     C                                                                    V1025520
2553.                     C    *** SUBROUTINE TIRE1 ***                                        V1025530
2554.                     C                                                                    V1025540
2555.                1          SUBROUTINE TIRE1(IU, IS, IA, ILR, IXY)                         V1025550
2556.                2          INTEGER R, W                                                   V1025560
2557.                3          COMMON /PAGE/ NE, HEAD(20), R, W                               V1025570
2558.                4          REAL MS, M, KT, JA, MZ, KKK                                    V1025580
2559.                5          COMMON /SLOPES/ SLOPEY(4,2,2,2)                                V1025590
2560.                6          COMMON /TIRES/ SRAD(4,2,2,2), CALF(4,2,2,2), CTS(4,2,2,2),     V1025600
2561.                          1       KT(4,2,2,2), CS(4,2,2,2), N(4,2,2,2), CAT(4,2,2,2),    V1025610
2562.                          2       YT(4,2,2,2), YTD(4,2,2,2), TSUM(4,3), XAXFOR(4,2,2),   V1025620
2563.                          3       YAXFOR(4,2,2), FYI(4,2,2,2), FXI(4,2,2,2), FXW(4,2,2,2),V1025630
2564.                          4       FYW(4,2,2,2), ALFRM(4,2,2,2), SLIP(4,2,2,2)            V1025640
2565.                7          COMMON /KEY/ MVEH, KEY(4,2), KDOLLY(4)                         V1025650
2566.                8          COMMON /WHEEL/ WHEELI(4,2,2,2)                                 V1025660
2567.                9          DIMENSION DERY(1)                                              V1025670
2568.               10          DIMENSION LL(4), LLL(8)                                        V1025680
2569.               11          DIMENSION SLOPEE(4), SLOPI(2)                                  V1025690
2570.               12          DIMENSION TLST(4,2,2,2), SLIPO(4,2,2,2), RMUO(4,2,2,2)         V1025700
2571.               13          DIMENSION UU(8), UPL(4), ULIN(2)                               V1025710
2572.               14          COMMON /TIRTAB/ UXY(4,3,2,2,10,6,3), VIBRK(4,3,2,2,6,3,10),    V1025720
2573.                          1       VBRK(4,3,2,2,6), FZBRK(4,3,2,2,6), X1ROLX(10,4,3,2,2), V1025730
2574.                          2       X1ROLY(10,4,3,2,2), X2ROLX(10,4,3,2,2), X2ROLY(10,4,3,2,2),V1025740
2575.                          3       XYROLX(10,10,4,3,2,2), XYROLY(10,10,4,3,2,2),          V1025750
2576.                          4       NMAXVI(4,3,2,2,6,3), NTABXY(4,3,2,2,2,2), N1ROLX(4,3,2,2),V1025760
2577.                          5       N1ROLY(4,3,2,2), N2ROLX(4,3,2,2), N2ROLY(4,3,2,2)      V1025770
2578.               15          DATA LL /4*0/                                                  V1025780
2579.               16          DATA RADIAN /57.2957795/                                       V1025790
2580.               17       10 FORMAT (I2)                                                    V1025800
2581.               18       20 FORMAT (3E10.2)                                                V1025810
2582.               19       30 FORMAT (2E10.2)                                                V1025820
2583.               20       40 FORMAT (4E10.2)                                                V1025830
2584.               21          KS = 3 * (IXY - 1) + 1                                         V1025840
2585.               22          READ (5,10) NTABXY(IU,IS,IA,ILR,1,IXY)                         V1025850
2586.               23          LEZ = NTABXY(IU,IS,IA,ILR,1,IXY) + KS - 1                      V1025860
2587.               24          READ (5,20) (FZBRK(IU,IS,IA,ILR,K),K=KS,LEZ)                   V1025870
2588.               25          READ (5,10) NTABXY(IL,IS,IA,ILR,2,IXY)                         V1025880
2589.               26          LV = NTABXY(IU,IS,IA,ILR,2,IXY)                                V1025890
2590.               27          LVV = LV + KS - 1                                              V1025900
2591.               28          READ (5,20) (VBRK(IU,IS,IA,ILR,K),K=KS,LVV)                    V1025910
2592.               29          DO 50 I = KS, LEZ                                              V1025920
2593.               30            DO 50 J = 1, LV                                              V1025930
2594.               31              READ (5,10) NMAXVI(IL,IS,IA,ILR,I,J)                       V1025940
2595.               32              NIL = NMAXVI(IU,IS,IA,ILR,I,J)                             V1025950
2596.               33              DO 50 K = 1, NIL                                           V1025960
2597.               34                READ (5,30) VIBRK(IU,IS,IA,ILR,I,J,K), UXY(IU,IS,IA,ILR,K,I,V1025970
2598.                          1       J)                                                     V1025980
2599.               35       50 CONTINUE                                                       V1025990
2600.               36          IF (IXY .EQ. 2) GO TO 90                                       V1026000
2601.               37          READ (5,10) N1RX                                               V1026010
2602.               38          N1ROLX(IU,IS,IA,ILR) = N1RX                                    V1026020
2603.               39          DO 60 I = 1, N1RX                                              V1026030
2604.               40       60 READ (5,30) X1ROLX(I,IU,IS,IA,ILR)                             V1026040
2605.               41          READ (5,10) N2RX                                               V1026050
2606.               42          N2ROLX(IU,IS,IA,ILR) = N2RX                                    V1026060
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   MTS          INTERNAL      **** F T N T I D Y ****
 LINE NO.       STMT NO.      INPUT LISTING

 2607.            43            DO 70 I = 1, N2RX                                                    V1026070
 2608.            44         70 READ (5,30) X2RCLX(I,IU,IS,IA,ILR)                                   V1026080
 2609.            45            DO 80 J = 1, N2RX                                                    V1026090
 2610.            46         80 READ (5,130) (XYRCLX(I,J,IU,IS,IA,ILR),I=1,N1RX)                     V1026100
 2611.            47            RETURN                                                               V1026110
 2612.            48         90 READ (5,10) N1RY                                                     V1026120
 2613.            49            N1RCLY(IU,IS,IA,ILR) = N1RY                                          V1026130
 2614.            50            DO 100 I = 1, N1RY                                                   V1026140
 2615.            51        100 READ (5,30) X1RCLY(I,IU,IS,IA,ILR)                                   V1026150
 2616.            52            READ (5,10) N2RY                                                     V1026160
 2617.            53            N2RCLY(IU,IS,IA,ILR) = N2RY                                          V1026170
 2618.            54            DO 110 I = 1, N2RY                                                   V1026180
 2619.            55        110 READ (5,30) X2RCLY(I,IU,IS,IA,ILR)                                   V1026190
 2620.            56            DO 120 J = 1, N2RY                                                   V1026200
 2621.            57        120 READ (5,130) (XYRCLY(I,J,IU,IS,IA,ILR),I=1,N1RY)                     V1026210
 2622.            58        130 FORMAT (10F10.2)                                                     V1026220
 2623.            59            RETURN                                                               V1026230
 2624.            60            ENTRY TIRDUP(IC,IS,IA,ILR,ITID,JTID,KTID,LTID,IXY)                   V1026240
 2625.            61            KS = 3 * (IXY - 1) + 1                                               V1026250
 2626.            62            NTABXY(IU,IS,IA,ILR,1,IXY) = NTABXY(ITID,JTID,KTID,LTID,1,IXY)       V1026260
 2627.            63            LEZ = NTABXY(IC,IS,IA,ILR,1,IXY) + KS - 1                            V1026270
 2628.            64            DO 140 K = KS, LEZ                                                   V1026280
 2629.            65        140 EZBRK(IU,IS,IA,ILR,K) = EZBRK(ITID,JTID,KTID,LTID,K)                 V1026290
 2630.            66            NTABXY(IU,IS,IA,ILR,2,IXY) = NTABXY(ITID,JTID,KTID,LTID,2,IXY)       V1026300
 2631.            67            LV = NTABXY(IU,IS,IA,ILR,2,IXY)                                      V1026310
 2632.            68            LVV = LV + KS - 1                                                    V1026320
 2633.            69            DO 150 K = KS, LVV                                                   V1026330
 2634.            70        150 VBRK(IU,IS,IA,ILR,K) = VBRK(ITID,JTID,KTID,LTID,K)                   V1026340
 2635.            71            DO 160 I = KS, LEZ                                                   V1026350
 2636.            72              DO 160 J = 1, LV                                                   V1026360
 2637.            73                NMAXV1(IU,IS,IA,ILR,I,J) = NMAXV1(ITID,JTID,KTID,LTID,I,J)      V1026370
 2638.            74                NIL = NMAXV1(IU,IS,IA,ILR,I,J)                                   V1026380
 2639.            75                DO 160 K = 1, NIL                                                V1026390
 2640.            76                  V1BRK(IU,IS,IA,ILR,I,J,K) = V1BRK(ITID,JTID,KTID,LTID,I,J,K) V1026400
 2641.            77                  UXY(IU,IS,IA,ILR,K,I,J) = UXY(ITID,JTID,KTID,LTID,K,I,J)     V1026410
 2642.            78        160 CONTINUE                                                             V1026420
 2643.            79            IF (IXY .EQ. 2) GO TO 200                                            V1026430
 2644.            80            N1RCLX(IU,IS,IA,ILR) = N1RCLX(ITID,JTID,KTID,LTID)                   V1026440
 2645.            81            N1RX = N1RCLX(ITID,JTID,KTID,LTID)                                   V1026450
 2646.            82            DO 170 I = 1, N1RX                                                   V1026460
 2647.            83        170 X1RCLX(I,IC,IS,IA,ILR) = X1RCLX(I,ITID,JTID,KTID,LTID)               V1026470
 2648.            84            N2RCLX(IU,IS,IA,ILR) = N2RCLX(ITID,JTID,KTID,LTID)                   V1026480
 2649.            85            N2RX = N2RCLX(ITID,JTID,KTID,LTID)                                   V1026490
 2650.            86            DO 180 I = 1, N2RX                                                   V1026500
 2651.            87        180 X2RCLX(I,IU,IS,IA,ILR) = X2RCLX(I,ITID,JTID,KTID,LTID)               V1026510
 2652.            88            DO 190 J = 1, N2RX                                                   V1026520
 2653.            89              DO 190 I = 1, N1RX                                                 V1026530
 2654.            90        190 XYRCLX(I,J,IU,IS,IA,ILR) = XYRCLX(I,J,ITID,JTID,KTID,LTID)           V1026540
 2655.            91            RETURN                                                               V1026550
 2656.            92        200 CONTINUE                                                             V1026560
 2657.            93            N1RCLY(IU,IS,IA,ILR) = N1RCLY(ITID,JTID,KTID,LTID)                   V1026570
 2658.            94            N1RY = N1RCLY(ITID,JTID,KTID,LTID)                                   V1026580
 2659.            95            DO 210 I = 1, N1RY                                                   V1026590
 2660.            96        210 X1RCLY(I,IC,IS,IA,ILR) = X1RCLY(I,ITID,JTID,KTID,LTID)               V1026600
 2661.            97            N2RCLY(IU,IS,IA,ILR) = N2RCLY(ITID,JTID,KTID,LTID)                   V1026610
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MTS LINE NO.  INTERNAL STMT NO.      **** F T N T I D Y ****
                                     INPUT LISTING
2662.         098                    N2RY = N2RCLY(ITID,JTID,KTID,LTID)                                  V1026620
2663.         099                    DO 220 I = 1, N2RY                                                  V1026630
2664.         100                220 X2RCLY(I,IC,IS,IA,IER) = X2RCLY(I,ITID,JTID,KTID,LTID)             V1026640
2665.         101                    DO 230 J = 1, N2RY                                                  V1026650
2666.         102                      DO 230 I = 1, N1RY                                                V1026660
2667.         103                230 XYRCLY(I,J,IC,IS,IA,IER) = XYRCLY(I,J,ITID,JTID,KTID,LTID)          V1026670
2668.         104                    RETURN                                                              V1026680
2669.         105                    END                                                                 V1026690
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES
TIRDUP	(R*4)	ENTRY	60D
TIRE1		SUBR	1D
<EXIT>		SUBR	47 59 91 104

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES
ALEPPM	(R*4)	ARRAY	TIRES	6C
CALF	(R*4)	ARRAY	TIRES	6C
CAT	(R*4)	ARRAY	TIRES	6C
CS	(R*4)	ARRAY	TIRES	6C
DERY	(R*4)	ARRAY		9C
DTS	(R*4)	ARRAY	TIRES	6C
EXI	(R*4)	ARRAY	TIRES	6C
EXW	(R*4)	ARRAY	TIRES	6C
EYI	(R*4)	ARRAY	TIRES	6C
EYW	(R*4)	ARRAY	TIRES	6C
EZBPK	(R*4)	ARRAY	TIRTAP	14C 24* 65*
HEAD	(R*4)	ARRAY	PAGE	3C
I	(I*4)			29* 31* 32 34* 39* 40 43* 44 46* 50* 51 54*
				55 57* 71* 73 74 76 77 82* 83 86* 87 89*
				90 95* 96 99* 100 102* 103
IA	(I*4)			1 22* 23 24* 25* 26 28* 31* 32 34* 38 40*
				42 44* 46* 49 51* 53 55* 57* 60 62 63 65
				66 67 70 73 74 76 77 80 83 84 87 90
				93 96 97 100 103
ILR	(I*4)			1 22* 23 24* 25* 26 28* 31* 32 34* 38 40
				42 44 46 49 51 53 55 57 60 62 63 65
				66 67 70 73 74 76 77 80 83 84 87 90
				93 96 97 100 103
IS	(I*4)			1 22* 23 24* 25* 26 28* 31* 32 34* 38 40*
				42 44* 46* 49 51* 53 55* 57* 60 62 63 65
				66 67 70 73 74 76 77 80 83 84 87 90
				93 96 97 100 103
ITID	(I*4)			60 62 65 66 70 73 76 77 80 81 83 84
				85 87 90 93 94 96 97 98 100 103
IU	(I*4)			1 22 23 24 25 26 28 31 32 34 38 40*
				42 44* 46* 49 51* 53 55* 57* 60 62 63 65
				66 67 70 73 74 76 77 80 83 84 87 90
				93 96 97 100 103
IXY	(I*4)			1 21 22 23 25 26 36 60 61 62 63 66
				67 79
J	(I*4)			30* 31 32 34* 45* 46* 56* 57* 72* 73 74 76
				77 88* 90 101* 103
JA	R*4			4D
JTID	(I*4)			60 62 65 66 70 73 76 77 80 81 83 84
				85 87 90 93 94 96 97 98 100 103
K	(I*4)			24* 28* 33* 34* 64* 65 69* 70 75* 76 77
KDOLLY	(I*4)	ARRAY	KEY	7C
KEY	(I*4)	ARRAY	KEY	7C
KKK	R*4			4D
KS	(I*4)			21* 23 24 27 28 29 61* 63 64 68 69 71
KT	R*4	ARRAY	TIRES	4D 6C

KTID	(I*4)			60	62	65	66	70	73	76	77	80	81	83	84
				85	87	90	93	94	96	97	98	100	103		
LEZ	(I*4)			23*	24	29	63*	64	71						
LTID	(I*4)			60	62	65	66	70	73	76	77	80	81	83	84
				85	87	90	93	94	96	97	98	100	103		
LV	(I*4)			26*	27	30	67*	68	72						
LVV	(I*4)			27*	28	68*	69								
L1	(I*4)	ARRAY		100	15										
L11	(I*4)	ARRAY		100											
MVEH	(I*4)		KEY	70											
MZ	R*4			40											
N	R*4	ARRAY	TIRES	40	60										
NMAXVI	(I*4)	ARRAY	TIRTAB	140	31*	32	73*	74							
NP	(I*4)		PAGE	30											
NS	R*4			40											
NTABXY	(I*4)	ARRAY	TIRTAB	140	22*	23	25*	26	62*	63	66*	67			
N11	(I*4)			32*	33	74*	75								
N1ROLX	(I*4)	ARRAY	TIRTAB	140	38*	80*	81								
N1ROLY	(I*4)	ARRAY	TIRTAB	140	49*	93*	94								
N1RX	(I*4)			37	38	39	46	81*	82	89					
N1RY	(I*4)			48	49	50	57	94*	95	102					
N2ROLX	(I*4)	ARRAY	TIRTAB	140	42*	84*	85								
N2ROLY	(I*4)	ARRAY	TIRTAB	140	53*	97*	98								
N2RX	(I*4)			41	42	43	45	85*	86	98					
N2RY	(I*4)			52	53	54	56	98*	99	101					
R	I*4		PAGE	20	30										
RADIAN	(R*4)			16											
RMUD	(R*4)	ARRAY		120											
SLIP	(R*4)	ARRAY	TIRES	60											
SLIPD	(R*4)	ARRAY		120											
SLOPEF	(R*4)	ARRAY		110											
SLOPEY	(R*4)	ARRAY	SLOPES	50											
SLOPL	(R*4)	ARRAY		110											
SRAD	(R*4)	ARRAY	TIRES	60											
TEST	(R*4)	ARRAY		120											
TSUM	(R*4)	ARRAY	TIRES	60											
ULIN	(R*4)	ARRAY		130											
UPL	(R*4)	ARRAY		130											
UU	(R*4)	ARRAY		130											
UXY	(R*4)	ARRAY	TIRTAB	140	34*	77*									
VBRK	(R*4)	ARRAY	TIRTAB	140	28*	70*									
VIBRK	(R*4)	ARRAY	TIRTAB	140	34*	76*									
W	I*4		PAGE	20	30										
WHEEL	(R*4)	ARRAY	WHEEL	80											
XAXFOR	(R*4)	ARRAY	TIRES	60											
XYROLX	(R*4)	ARRAY	TIRTAB	140	46*	90*									
XYROLY	(R*4)	ARRAY	TIRTAB	140	57*	103*									
X1ROLX	(R*4)	ARRAY	TIRTAB	140	40*	82*									
X1ROLY	(R*4)	ARRAY	TIRTAB	140	51*	96*									
X2ROLX	(R*4)	ARRAY	TIRTAB	140	44*	87*									
X2ROLY	(R*4)	ARRAY	TIRTAB	140	55*	100*									
YAXFOR	(R*4)	ARRAY	TIRES	60											
YT	(R*4)	ARRAY	TIRES	60											
YTD	(R*4)	ARRAY	TIRES	60											
1				22*											
2				25*											

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES						
10	17	FMT	22	25	31	37	41	48	52
20	18	FMT	24	28					
30	19	FMT	34	40	44	51	55		
40	20	FMT							
50	35		29	30	33				
60	40		39						
70	44		43						
80	46		45						
90	48		36						
100	51		50						
110	55		54						
120	57		56						
130	58	FMT	46	57					
140	65		64						
150	70		69						
160	78		71	72	75				
170	83		82						
180	87		86						
190	90		88	89					
200	92		79						
210	96		95						
220	100		99						
230	103		101	102					

*** LOGICAL I/O UNIT DICTIONARY ***

UNIT	REFERENCES													
5	22R 57R	24R	25R	28R	31R	34R	37R	40R	41R	44R	46R	48R	51R	52R	55R

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TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION

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```
  MTS          INTERNAL      ****  F T N T  I D Y  ****
LINE NO.       STMT NO.      INPUT LISTING

2670.             1          SUBROUTINE TIRINI(IVEH, JSUS)                                          V1026700
2671.             2          INTEGER R, W                                                           V1026710
2672.             3          REAL*8 AXLE                                                            V1026720
2673.             4          COMMON /PAGE/ NP, HEAD(20), R, W                                       V1026730
2674.             5          REAL NS, N, KT, JA, MZ, KKK                                            V1026740
2675.             6          COMMON /STATIC/ NS(4,2,2), FT(4), SF(4,2,2)                            V1026750
2676.             7          COMMON /SPRING/ S(4,2,2,2), SD(4,2,2,2), THETAX(4,2,2),                V1026760
2677.                       1        DTHAX(4,2,2), ZAXLE(4,2,2), DZAXLE(4,2,2), DV(4,2,2,2),      V1026770
2678.                       2        NOSPR(4,2,2,2,2), DEFSPR(320), FORSPR(320), ZO(4,2,2,2),     V1026780
2679.                       3        XLOAD(4,2,2,2)                                               V1026790
2680.             8          COMMON /TURN/ NCTURN(2,2), TURNX(50), TURNY(50), DELT(4,2,2,2)         V1026800
2681.             9          COMMON /ROADD/ DZDXO, DZDYO, IROAD, XFRONT(4), XBACK(4)                V1026810
2682.            10          COMMON /SLOPES/ SLOPEY(4,2,2,2)                                        V1026820
2683.            11          COMMON /TIRES/ SRAD(4,2,2,2), CALF(4,2,2,2), CTS(4,2,2,2),             V1026830
2684.                       1        KT(4,2,2,2), CS(4,2,2,2), N(4,2,2,2), CAT(4,2,2,2),          V1026840
2685.                       2        YT(4,2,2,2), YTD(4,2,2,2), TSUM(4,3), XAXFOR(4,2,2),         V1026850
2686.                       3        YAXFOR(4,2,2), FYI(4,2,2,2), FXI(4,2,2,2), FXW(4,2,2,2),     V1026860
2687.                       4        FYW(4,2,2,2), ALFRRM(4,2,2,2), SLIP(4,2,2,2)                 V1026870
2688.            12          COMMON /UNSPM/ KKK(4,2,2,2), C(4,2,2,2), JA(4,2,2), RCI(4,2,2),       V1026880
2689.                       1        SYI(4,2,2), TRA(4,2,2), ASW(4,2,2), ASM(4,2,2),              V1026890
2690.                       2        AXDELT(4,2,2), RST(4,2,2), KRS(4,2,2), AUXROL(4,2,2),        V1026900
2691.                       3        CF(4,2,2,2)                                                  V1026910
2692.            13          COMMON /SPMASS/ WHBS(4), BBL(4), AB(4), APHI(4), DELTA(4), VW(4),      V1026920
2693.                       1        VJ(4,3), PW(4), PX(4), PZ(4), PJ(4,3), SNL(4,2), D(4),       V1026930
2694.                       2        PH(4), TCL(4), MCS                                           V1026940
2695.            14          COMMON /PIN/ EPINX(4), EPINY(4), EPIN(3), XMOM, CELPIN, PSIDOL(4),     V1026950
2696.                       1        TEQSAX(4), TEQRBX(4), TEQRAY(4), TEQRBY(4), TEQRAZ, TEQRBZ   V1026960
2697.            15          COMMON /ECTOUT/ XBAR(4,3), PHIBAR(4,3), UBAR(4,3), PBAR(4,3)           V1026970
2698.            16          COMMON /KEY/ MVEE, KEY(4,2), KDOLLY(4)                                 V1026980
2699.            17          COMMON /CMACC/ XDDCM(4), YDDCM(4), PSIDD(4), DBX(4), DBY(4)            V1026990
2700.            18          COMMON /WHEEL/ WHEELI(4,2,2,2)                                         V1027000
2701.            19          COMMON /WSPD/ UW(4,2,2,2)                                              V1027010
2702.            20          DIMENSION CST(4,2,2,2)                                                 V1027020
2703.            21          DIMENSION T(4,2,2,2), DT(4,2,2,2), SRS(4,2,2,2), FX(4,2,2,2),          V1027030
2704.                       1        SLOPE(4,2,2,2), MZ(4,2,2,2), XXS(4,2,2)                      V1027040
2705.            22          DIMENSION DERY(1)                                                      V1027050
2706.            23          DIMENSION CAM(4,2,2,2)                                                 V1027060
2707.            24          DIMENSION KLAST(4,2,2,2,2)                                             V1027070
2708.            25          DIMENSION TALIGN(4,2,2,2), SLOPYO(4,2,2,2)                             V1027080
2709.            26          DIMENSION LL(4), LLL(8)                                                V1027090
2710.            27          DIMENSION SLOPEF(4), SLOPEL(2)                                         V1027100
2711.            28          DIMENSION ILST(4,2,2,2), SLIPO(4,2,2,2), PMUC(4,2,2,2)                 V1027110
2712.            29          DIMENSION UU(9), UPL(4), ULIN(2)                                       V1027120
2713.            30          COMMON /DUAL/ DUALTC(4,2,2,2)                                          V1027130
2714.            31          COMMON /TIRTAB/ UXY(4,3,2,2,10,6,3), VIBRK(4,3,2,2,6,3,10),            V1027140
2715.                       1        VBRK(4,3,2,2,6), FZBRK(4,3,2,2,6), XIROLX(10,4,3,2,2),       V1027150
2716.                       2        XIROLY(10,4,3,2,2), X2ROLX(10,4,3,2,2), X2ROLY(10,4,3,2,2),V1027160
2717.                       3        XYROLX(10,10,4,3,2,2), XYROLY(10,10,4,3,2,2),                V1027170
2718.                       4        NMAXVI(4,3,2,2,6,3), NTABXY(4,3,2,2,2,2), NIROLX(4,3,2,2),   V1027180
2719.                       5        NIROLY(4,3,2,2), N2ROLX(4,3,2,2), N2ROLY(4,3,2,2)            V1027190
2720.            32          DATA LL /4*0/                                                          V1027200
2721.            33          DATA KLAST /64*1/                                                      V1027210
2722.            34          DATA RADIAN /57.2957795/                                               V1027220
2723.            35          DIMENSION VEH(2,3), TIRES(3,2), SIDE(3,2), AXLE(3,2)                   V1027230
2724.            36          DATA VEH /' TRA', 'CTOR', ' TRA', 'ILER', ' TRU', 'CK  '/              V1027240
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   MTS          INTERNAL      **** F T N T I D Y ****
 LINE NO.       STMT NO.      INPUT LISTING

2725.             37          DATA TIRES /' FRO', 'NT T', 'IRES', ' REA', 'R TI', 'RES'/          V1027250
2726.             38          DATA SIDE /'LEFT', ' SID', 'E   ', 'RIGH', 'T SI', 'DE  '/         V1027260
2727.             39          DATA AXLE /'LEADING ', 'TANDEM A', 'XLE     ', 'TRAILING',         V1027270
2728.                        1     ' TANDEM ', 'AXLE    '/                                       V1027280
2729.                  C                                                                         V1027290
2730.                  C   READ TIRE PARAMETERS                                                  V1027300
2731.                  C                                                                         V1027310
2732.             40          DZDYO = 0.                                                        V1027320
2733.             41          ZRDAD = 0.                                                        V1027330
2734.             42          DTS(1,1,1,1) = 0.                                                 V1027340
2735.             43          DTS(1,1,1,2) = 0.                                                 V1027350
2736.             44          DO 10 L = 1, 2                                                    V1027360
2737.             45            DO 10 K = 1, 2                                                  V1027370
2738.             46              DUALTO(IVEH,JSUS,K,L) = 0.                                    V1027380
2739.             47              SLIP(IVEH,JSUS,K,L) = 0.                                      V1027390
2740.             48              SLIPO(IVEH,JSUS,K,L) = 0.                                     V1027400
2741.             49              RMUO(IVEH,JSUS,K,L) = 0.                                      V1027410
2742.             50              SLOPE(IVEH,JSUS,K,L) = 5.                                     V1027420
2743.             51              SLOPYO(IVEH,JSUS,K,L) = 0.                                    V1027430
2744.             52        10  TLST(IVEH,JSUS,K,L) = 0.                                       V1027440
2745.             53          JKK = 1                                                           V1027450
2746.             54          IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                                V1027460
2747.             55          DO 20 KAX = 1, JKK                                                V1027470
2748.             56            IF (IVEH .GT. 1 .OR. JSUS .GT. 1) READ (R,90) (DTS(IVEH,JSUS,   V1027480
2749.                        1  KAX,LSIDE),LSIDE=1,2)                                           V1027490
2750.             57            IF (DTS(IVEH,JSUS,KAX,2) .EQ. 0.) DTS(IVEH,JSUS,KAX,2) = DTS(  V1027500
2751.                        1  IVEH,JSUS,KAX,1)                                                V1027510
2752.             58            READ (R,90) (CALE(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2)              V1027520
2753.             59            IF (CALE(IVEH,JSUS,KAX,2) .EQ. 0.) CALE(IVEH,JSUS,KAX,2) = CALE(V1027530
2754.                        1  IVEH,JSUS,KAX,1)                                                V1027540
2755.             60            IN = CALE(IVEH,JSUS,KAX,1)                                      V1027550
2756.             61            IF (CALE(IVEH,JSUS,KAX,1) .LT. 0.) CALL TABDIR(IN, IVEH, JSUS,  V1027560
2757.                        1       KAX, 1, IV, JS, KA, LS, YN, 2)                            V1027570
2758.             62            IN = CALE(IVEH,JSUS,KAX,2)                                      V1027580
2759.             63            IF (CALE(IVEH,JSUS,KAX,2) .LT. 0.) CALL TABDIR(IN, IVEH, JSUS,  V1027590
2760.                        1       KAX, 2, IV, JS, KA, LS, YN, 2)                            V1027600
2761.             64            READ (R,90) (CS(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2)                V1027610
2762.             65            IF (CS(IVEH,JSUS,KAX,2) .EQ. 0.) CS(IVEH,JSUS,KAX,2) = CS(IVEH, V1027620
2763.                        1  JSUS,KAX,1)                                                     V1027630
2764.             66            IN = CS(IVEH,JSUS,KAX,1)                                        V1027640
2765.             67            IF (CS(IVEH,JSUS,KAX,1) .LT. 0.) CALL TABDIR(IN, IVEH, JSUS,    V1027650
2766.                        1       KAX, 1, IV, JS, KA, LS, YN, 3)                            V1027660
2767.             68            IN = CS(IVEH,JSUS,KAX,2)                                        V1027670
2768.             69            IF (CS(IVEH,JSUS,KAX,2) .LT. 0.) CALL TABDIR(IN, IVEH, JSUS,    V1027680
2769.                        1       KAX, 2, IV, JS, KA, LS, YN, 3)                            V1027690
2770.             70            READ (R,90) (CAM(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2)               V1027700
2771.             71            IF (CAM(IVEH,JSUS,KAX,2) .EQ. 0.) CAM(IVEH,JSUS,KAX,2) = CAM(  V1027710
2772.                        1  IVEH,JSUS,KAX,1)                                                V1027720
2773.             72            READ (R,90) (CAT(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2)               V1027730
2774.             73            IF (CAT(IVEH,JSUS,KAX,2) .EQ. 0.) CAT(IVEH,JSUS,KAX,2) = CAT(  V1027740
2775.                        1  IVEH,JSUS,KAX,1)                                                V1027750
2776.             74            READ (R,90) (KT(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2)                V1027760
2777.             75            IF (KT(IVEH,JSUS,KAX,2) .EQ. 0.) KT(IVEH,JSUS,KAX,2) = KT(IVEH, V1027770
2778.                        1  JSUS,KAX,1)                                                     V1027780
2779.             76            READ (R,90) (SRAD(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2)              V1027790
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   MTS          INTERNAL       ****  E N T E D Y ****
 LINE NO.       STMT NO.       INPUT LISTING

 2780.            77              IF (SRAD(IVEH,JSUS,KAX,2) .EQ. 0.) SRAD(IVEH,JSUS,KAX,2) = SRAD( V1027800
 2781.                          1  IVEH,JSUS,KAX,1)                                                 V1027810
 2782.            78              READ (8,90) (WHEELI(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2)              V1027820
 2783.            79              IF (WHEELI(IVEH,JSUS,KAX,2) .EQ. 0.) WHEELI(IVEH,JSUS,KAX,2) =   V1027830
 2784.                          1  WHEELI(IVEH,JSUS,KAX,1)                                          V1027840
 2785.            80           20 CONTINUE                                                          V1027850
 2786.                     C                                                                       V1027860
 2787.                     C    ECHO                                                               V1027870
 2788.                     C                                                                       V1027880
 2789.            81              ITN = IVEH - 1                                                    V1027890
 2790.            82              IV = 1                                                            V1027900
 2791.            83              IF (MVEH .EQ. 1) IV = 3                                           V1027910
 2792.            84              IF (IVEH .GE. 2) IV = 2                                           V1027920
 2793.            85              IF (KEY(IVEH,JSUS) .EQ. 1) GO TO 30                               V1027930
 2794.            86              IF (IVEH .EQ. 1) WRITE (W,100) (VEH(IJ,IV),IJ=1,2),               V1027940
 2795.                          1(TIRES(IJ,JSUS),IJ=1,3), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)            V1027950
 2796.            87              IF (IVEH .GT. 1) WRITE (W,110) (VEH(IJ,IV),IJ=1,2), ITN,          V1027960
 2797.                          1(TIRES(IJ,JSUS),IJ=1,3), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)            V1027970
 2798.            88              IF (IVEH .GT. 1 .OR. JSUS .GT. 1) WRITE (W,140) (DTS(IVEH,JSUS,1, V1027980
 2799.                          1LSIDE),LSIDE=1,2)                                                 V1027990
 2800.            89              WRITE (W,160) (CALE(IVEH,JSUS,1,LSIDE),LSIDE=1,2)                 V1028000
 2801.            90              IF (CALE(IVEH,JSUS,1,1) .LT. 0. .OR. CALE(IVEH,JSUS,1,2) .LT. 0.) V1028010
 2802.                          1       WRITE (W,180)                                              V1028020
 2803.            91              WRITE (W,190) (CS(IVEH,JSUS,1,LSIDE),LSIDE=1,2)                   V1028030
 2804.            92              IF (CS(IVEH,JSUS,1,1) .LT. 0. .OR. CS(IVEH,JSUS,1,2) .LT. 0.)     V1028040
 2805.                          1       WRITE (W,180)                                              V1028050
 2806.            93              WRITE (W,270) (CAM(IVEH,JSUS,1,LSIDE),LSIDE=1,2)                  V1028060
 2807.            94              WRITE (W,40) (CAT(IVEH,JSUS,1,LSIDE),LSIDE=1,2)                   V1028070
 2808.            95              WRITE (W,210) (KT(IVEH,JSUS,1,LSIDE),LSIDE=1,2)                   V1028080
 2809.            96              WRITE (W,230) (SRAD(IVEH,JSUS,1,LSIDE),LSIDE=1,2)                 V1028090
 2810.            97              WRITE (W,250) (WHEELI(IVEH,JSUS,1,LSIDE),LSIDE=1,2)               V1028100
 2811.            98              GO TO 60                                                          V1028110
 2812.            99           30 CONTINUE                                                          V1028120
 2813.           100              IF (IVEH .EQ. 1) WRITE (W,120) (VEH(IJ,IV),IJ=1,2),               V1028130
 2814.                          1(TIRES(IJ,JSUS),IJ=1,3), ((AXLE(IJ,IK),IJ=1,3),IK=1,2),           V1028140
 2815.                          2((SIDE(IJ,IK),IJ=1,3),IK=1,2), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)      V1028150
 2816.           101              IF (IVEH .GT. 1) WRITE (W,130) (VEH(IJ,IV),IJ=1,2), ITN,          V1028160
 2817.                          1(TIRES(IJ,JSUS),IJ=1,3), ((AXLE(IJ,IK),IJ=1,3),IK=1,2),           V1028170
 2818.                          2((SIDE(IJ,IK),IJ=1,3),IK=1,2), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)      V1028180
 2819.           102              IF (IVEH .GT. 1 .OR. JSUS .GT. 1) WRITE (W,150) ((DTS(IVEH,JSUS,  V1028190
 2820.                          1KAX,LSIDE),LSIDE=1,2),KAX=1,2)                                    V1028200
 2821.           103              WRITE (W,170) ((CALE(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2),KAX=1,2)     V1028210
 2822.           104              IF (CALE(IVEH,JSUS,1,1) .LT. 0. .OR. CALE(IVEH,JSUS,1,2) .LT. 0.  V1028220
 2823.                          1       .OR. CALE(IVEH,JSUS,2,1) .LT. 0. .OR. CALE(IVEH,JSUS,2,2) .  V1028230
 2824.                          2       LT. 0.) WRITE (W,180)                                      V1028240
 2825.           105              WRITE (W,200) ((CS(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2),KAX=1,2)       V1028250
 2826.           106              IF (CS(IVEH,JSUS,1,1) .LT. 0. .OR. CS(IVEH,JSUS,1,2) .LT. 0. .OR. V1028260
 2827.                          1       CS(IVEH,JSUS,2,1) .LT. 0. .OR. CS(IVEH,JSUS,2,2) .LT. 0.)  V1028270
 2828.                          2       WRITE (W,180)                                              V1028280
 2829.           107              WRITE (W,280) ((CAM(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2),KAX=1,2)      V1028290
 2830.           108              WRITE (W,50) ((CAT(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2),KAX=1,2)       V1028300
 2831.           109              WRITE (W,220) ((KT(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2),KAX=1,2)       V1028310
 2832.           110              WRITE (W,240) ((SRAD(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2),KAX=1,2)     V1028320
 2833.           111              WRITE (W,260) ((WHEELI(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2),KAX=1,2)   V1028330
 2834.           112           40 FORMAT (' ', T10, 'ALIGNING MOMENT  (IN-LB/DEG/TIRE)', T90, F10.2,V1028340
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   MTS          INTERNAL       **** F T N T I D Y ****
 LINE NO.       STMT NO.       INPUT LISTING

 2835.                        1       T110, F10.2)                                                    V1028350
 2836.          113         50 FORMAT (' ', T10, 'ALIGNING MOMENT  (IN-LB/DEG/TIRE)', T74, F10.2,V1028360
 2837.                        1       3X, F10.2, T105, F10.2, 3X, F10.2)                              V1028370
 2838.          114         60 CONTINUE                                                             V1028380
 2839.                      C                                                                       V1028390
 2840.                      C   UNIT CONVERSIONS                                                    V1028400
 2841.                      C                                                                       V1028410
 2842.                      C**** ADD IN DUAL TIRE CONSIDERATIONS                                   V1028420
 2843.          115             NDUM = KEY(IVEH,JSUS) + 1                                           V1028430
 2844.          116             DO 70 K = 1, NDUM                                                   V1028440
 2845.          117               IF (IVEH .EQ. 1 .AND. JSUS .EQ. 1 .AND. K .EQ. 2) GO TO 70        V1028450
 2846.          118               IF (IVEH .EQ. 2 .AND. JSUS .EQ. 1) GO TO 70                       V1028460
 2847.          119               DO 70 I = 1, 2                                                    V1028470
 2848.          120                 DTC = 1.                                                        V1028480
 2849.          121                 DTS(IVEH,JSUS,K,I) = DTS(IVEH,JSUS,K,I) / 12.                   V1028490
 2850.          122                 IF (DTS(IVEH,JSUS,K,I) .GT. 0.) DTC = 2.                        V1028500
 2851.          123                 IF (CALF(IVEH,JSUS,K,I) .GT. 0.) CALF(IVEH,JSUS,K,I) = CALF(   V1028510
 2852.                            1    IVEH,JSUS,K,I) * RADIAN * DTC                                 V1028520
 2853.          124                 IF (KT(IVEH,JSUS,K,I) .GT. 0) KT(IVEH,JSUS,K,I) = KT(IVEH,     V1028530
 2854.                            1    JSUS,K,I) * 12. * DTC                                         V1028540
 2855.          125                 CST(IVEH,JSUS,K,I) = 0.10 * SQRT(2.*ASW(IVEH,JSUS,K)*KT(IVEH,  V1028550
 2856.                            1    JSUS,K,I)/32.16666)                                           V1028560
 2857.          126                 IF (CS(IVEH,JSUS,K,I) .GT. 0.) CS(IVEH,JSUS,K,I) = CS(IVEH,    V1028570
 2858.                            1    JSUS,K,I) * DTC                                               V1028580
 2859.          127                 SRAD(IVEH,JSUS,K,I) = SRAD(IVEH,JSUS,K,I) / 12.                 V1028590
 2860.          128                 WHEELI(IVEH,JSUS,K,I) = WHEELI(IVEH,JSUS,K,I) / 12. * DTC       V1028600
 2861.          129                 CAT(IVEH,JSUS,K,I) = CAT(IVEH,JSUS,K,I) * RADIAN / 12.          V1028610
 2862.          130                 CAM(IVEH,JSUS,K,I) = CAM(IVEH,JSUS,K,I) * RADIAN * DTC          V1028620
 2863.          131             70 CONTINUE                                                         V1028630
 2864.          132               RETURN                                                            V1028640
 2865.                      C                                                                       V1028650
 2866.                      C   FORMATS                                                             V1028660
 2867.                      C                                                                       V1028670
 2868.          133             80 FORMAT ('1', T36, 'FSRI TRUCK AND TRACTOR-TRAILER DYNAMIC ',     V1028680
 2869.                            1 'RESPONSE SIMULATION - T3DRS,V1', T115, 'INPUT PAGE NO.',       V1028690
 2870.                            2 I3//T36, 20A4///)                                               V1028700
 2871.          134             90 FORMAT (2F15.3)                                                  V1028710
 2872.          135            100 FORMAT ('0', T4, 2A4, 3A4, ' AND WHEELS', T90, 3A4, T110, 3A4/T5, V1028720
 2873.                            1 '-------', '----------------------', T90, '---------',         V1028730
 2874.                            2 T110, '----------')                                             V1028740
 2875.          136            110 FORMAT ('0', T4, 2A4, ' NO.', I2, 3A4, ' AND WHEELS', T90, 3A4,  V1028750
 2876.                            1 T110, 3A4/T5, '----------', '--------------------', T90,        V1028760
 2877.                            2 '---------', T110, '----------')                                V1028770
 2878.          137            120 FORMAT ('0', T4, 2A4, 3A4, ' AND WHEELS', T75, 3A8, T105, 3A8/T5, V1028780
 2879.                            1 '-----', '------------------------', T75,                       V1028790
 2880.                            2 '--------------------', T105, '--------------------'/T74,       V1028800
 2881.                            3 3A4, 3A4, T105, 3A4, 3A4/T74, '---------', 3X,                  V1028810
 2882.                            4 '----------', T105, '---------', 3X, '----------')              V1028820
 2883.          138            130 FORMAT ('0', T4, 2A4, ' NO.', I2, 3A4, ' AND WHEELS', T75, 3A8,  V1028830
 2884.                            1 T105, 3A8/T5, '----------', '--------------------', T75,        V1028840
 2885.                            2 '--------------------', T105, '--------------------'/T74,       V1028850
 2886.                            3 3A4, 3A4, T105, 3A4, 3A4/T74, '---------', 3X,                  V1028860
 2887.                            4 '----------', T105, '---------', 3X, '----------')              V1028870
 2888.          139            140 FORMAT ('0', T10, 'DUAL TIRE SEPARATION (IN)', T90, F10.2, T110, V1028880
 2889.                            1 F10.2)                                                          V1028890
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   MTS          INTERNAL      **** F T N T I D Y ****
LINE NO.        STMT NO.      INPUT LISTING

2890.             140       150 FORMAT ('0', T10, 'DUAL TIRE SEPARATION (IN)', T74, F10.2, 3X,     V1028900
2891.                       1       F10.2, T105, F10.2, 3X, F10.2)                                  V1028910
2892.             141       160 FORMAT (' ', T10, 'CORNERING STIFFNESS  (LB/DEG/TIRE)', T90,       V1028920
2893.                       1       F10.2, T110, F10.2)                                             V1028930
2894.             142       170 FORMAT (' ', T10, 'CORNERING STIFFNESS  (LB/DEG/TIRE)', T74,       V1028940
2895.                       1       F10.2, 3X, F10.2, T105, F10.2, 3X, F10.2)                       V1028950
2896.             143       180 FORMAT (' ', T15, '*** NEGATIVE ENTRY INDICATES TABLE ENTERED ***'V1028960
2897.                       1       /T15, '*** ECHO WILL APPEAR ON TABLE INDEX PAGE ***')           V1028970
2898.             144       190 FORMAT (' ', T10, 'LONGITUDINAL STIFFNESS  (LB/SLIP/TIRE)', T90,    V1028980
2899.                       1       F10.2, T110, F10.2)                                             V1028990
2900.             145       200 FORMAT (' ', T10, 'LONGITUDINAL STIFFNESS  (LB/SLIP/TIRE)', T74,    V1029000
2901.                       1       F10.2, 3X, F10.2, T105, F10.2, 3X, F10.2)                       V1029010
2902.             146       210 FORMAT (' ', T10, 'TIRE SPRING RATE (LB/IN/TIRE)', T90, F10.2,     V1029020
2903.                       1       T110, F10.2)                                                    V1029030
2904.             147       220 FORMAT (' ', T10, 'TIRE SPRING RATE (LB/IN/TIRE)', T74, F10.2, 3X,V1029040
2905.                       1       F10.2, T105, F10.2, 3X, F10.2)                                  V1029050
2906.             148       230 FORMAT (' ', T10, 'TIRE LOADED RADIUS (IN)', T90, F10.2, T110,     V1029060
2907.                       1       F10.2)                                                          V1029070
2908.             149       240 FORMAT (' ', T10, 'TIRE LOADED RADIUS (IN)', T74, F10.2, 3X,       V1029080
2909.                       1       F10.2, T105, F10.2, 3X, F10.2)                                  V1029090
2910.             150       250 FORMAT (' ', T10, 'POLAR MOMENT OF INERTIA (IN-LB-SEC**2/WHEEL)', V1029100
2911.                       1       T90, F10.2, T110, F10.2)                                        V1029110
2912.             151       260 FORMAT (' ', T10, 'POLAR MOMENT OF INERTIA (IN-LB-SEC**2/WHEEL)', V1029120
2913.                       1       T74, F10.2, 3X, F10.2, T105, F10.2, 3X, F10.2)                  V1029130
2914.             152       270 FORMAT (' ', T10, 'CAMBER STIFFNESS (LB/DEG/TIRE)', T90, F10.2,    V1029140
2915.                       1       T110, F10.2)                                                    V1029150
2916.             153       280 FORMAT (' ', T10, 'CAMBER STIFFNESS (LB/DEG/TIRE)', T74, F10.2,    V1029160
2917.                       1       3X, F10.2, T105, F10.2, 3X, F10.2)                              V1029170
2918.                     C                                                                         V1029180
2919.                     C                                                                         V1029190
2920.             154             ENTRY TIRE(IU,IS,IA,ILR,IXY,T,DT,SRS,XXS,DERY,TALIGN,X)           V1029200
2921.             155             IVEE = IU                                                         V1029210
2922.             156             JSOS = IS                                                         V1029220
2923.             157             KAX = IA                                                          V1029230
2924.             158             LSIDE = ILR                                                       V1029240
2925.                     C                                                                         V1029250
2926.             159             SIGNN = (-1) ** ILR                                               V1029260
2927.             160             IF (IROAD .EQ. 0) GO TO 320                                       V1029270
2928.             161             XROAD = XBAR(IU,1) + XXS(IU,IS,IA) * COS(PHIBAR(IU,3)) - TRA(IU,  V1029280
2929.                           1IS,IA) * SIGNN * SIN(PHIBAR(IU,3))                                 V1029290
2930.             162             YROAD = XBAR(IU,2) + TRA(IU,IS,IA) * SIGNN * COS(PHIBAR(IU,3)) +  V1029300
2931.                           1XXS(IU,IS,IA) * SIN(PHIBAR(IU,3))                                  V1029310
2932.             163             IF (IU .LE. 1) GO TO 300                                          V1029320
2933.             164             DO 290 IDM = 2, IU                                                V1029330
2934.             165               XROAD = XROAD - XPACK(IDM - 1) * COS(PHIBAR(IDM - 1,3)) - TOLE  V1029340
2935.                           1   IDM) * COS(PSIDOT(IDM)) - XFRONT(IDM) * COS(PHIBAR(IDM,3))      V1029350
2936.             166         290 CONTINUE                                                          V1029360
2937.             167         300 IF (IROAD .LT. 0) GO TO 310                                       V1029370
2938.             168             ZROAD = XROAD * DZDXO + YROAD * DZDYO                             V1029380
2939.             169             DZDYO = DZDYO * COS(PHIBAR(IU,3)) - DZDXO * SIN(PHIBAR(IU,3))     V1029390
2940.             170             GO TO 320                                                         V1029400
2941.             171         310 CALL ROAD(XROAD, YROAD, ZROAD, X)                                 V1029410
2942.             172             CALL ROADDZ(XROAD, YROAD, DZDX, DZDY)                             V1029420
2943.             173             DZDY = -SIN(PHIBAR(IU,3)) * DZDX + COS(PHIBAR(IU,3)) * DZDY       V1029430
2944.                     C                                                                         V1029440
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   MTS          INTERNAL      **** F I N T I D Y ****
LINE NO.        STMT NO.      INPUT LISTING

2945.                    C                                                                  V1029450
2946.                174       320 N(IVEH,JSUS,KAX,LSIDE) = NS(IVEH,JSUS,KAX) / 2. + KT(IVEH,JSUS,   V1029460
2947.                           1KAX,LSIDE) * (-ZROAD + YT(IVEH,JSUS,KAX,LSIDE)) + CST(IVEH,JSUS,     V1029470
2948.                           2KAX,LSIDE) * YTD(IVEH,JSUS,KAX,LSIDE)                                 V1029480
2949.                175        IF (N(IVEH,JSUS,KAX,LSIDE) .LE. 0.) N(IVEH,JSUS,KAX,LSIDE) = 0.       V1029490
2950.                           10000)                                                                  V1029500
2951.                    C                                                                  V1029510
2952.                    C                                                                  V1029520
2953.                176        VI = UBAR(IVEH,2) + PBAR(IVEH,3) * XXS(IVEH,JSUS,KAX) - PBAR(IVEH,     V1029530
2954.                           1L) * (DELTA(IVEH) - RCI(IVEH,JSUS,KAX))                               V1029540
2955.                177        UI = UBAR(IVEH,1) - PBAR(IVEH,3) * TRA(IVEH,JSUS,KAX) * SIGNN +        V1029550
2956.                           1PBAR(IVEH,2) * AXDELT(IVEH,JSUS,KAX)                                   V1029560
2957.                    C                                                                  V1029570
2958.                    C                                                                  V1029580
2959.                178        UW(IVEH,JSUS,KAX,LSIDE) = UI * COS(DELT(IVEH,JSUS,KAX,LSIDE)) +        V1029590
2960.                           1VI * SIN(DELT(IVEH,JSUS,KAX,LSIDE))                                    V1029600
2961.                    C                                                                  V1029610
2962.                179        IF (ABS(UI) .LT. 3.) GO TO 330                                          V1029620
2963.                180        ALPRM(IVEH,JSUS,KAX,LSIDE) = ATAN(VI/UI) - DELT(IVEH,JSUS,KAX,         V1029630
2964.                           1LSIDE)                                                                 V1029640
2965.                181        ALFA = ALPRM(IU,IS,IA,ILR)                                              V1029650
2966.                182        IF (CALF(IU,IS,IA,ILR) .GT. 0. .AND. ABS(ALFA) .GT. 0.1)               V1029660
2967.                           1ALPRM(IU,IS,IA,ILR) = SIGN(0.1,ALFA)                                   V1029670
2968.                183      330 CONTINUE                                                              V1029680
2969.                    C                                                                  V1029690
2970.                    C                                                                  V1029700
2971.                184        IF (IYY .EQ. 2) GO TO 360                                               V1029710
2972.                    C  SLIP LOOP CALCULATION.                                          V1029720
2973.                185        UUU = UW(IVEH,JSUS,KAX,LSIDE)                                           V1029730
2974.                186        DTT = X - TLST(IU,IS,IA,ILR)                                            V1029740
2975.                187        IF (DTT .EQ. 0.) GO TO 350                                              V1029750
2976.                188        IF (UUU .GT. 0.50) GO TO 340                                            V1029760
2977.                189        SLIP(IU,IS,IA,ILR) = SLIPO(IU,IS,IA,ILR)                                V1029770
2978.                190        GO TO 350                                                               V1029780
2979.                191      340 DUMM = (SRAD(IU,IS,IA,ILR)**2) * N(IU,IS,IA,ILR) / (WHEELI(IU,IS,     V1029790
2980.                           1IA,ILR)*UUU)                                                           V1029800
2981.                192        IUU = (IU - 1) * 28 + 12                                                V1029810
2982.                193        QQ = DUMM * SLOPE(IU,IS,IA,ILR) + (XDDCM(IU) - TRA(IU,IS,IA)*DERY(     V1029820
2983.                           1IUU)*SIGNN) / UUU                                                      V1029830
2984.                194        SSS = SLIP(IU,IS,IA,ILR)                                                V1029840
2985.                195        FF = DUMM * (SLOPE(IU,IS,IA,ILR)*SLIPO(IU,IS,IA,ILR) - RMUO(IU,IS,     V1029850
2986.                           1IA,ILR)*SIGN(1.,SSS)) + T(IU,IS,IA,ILR) * SRAD(IU,IS,IA,ILR) / (       V1029860
2987.                           2WHEELI(IU,IS,IA,ILR)*UUU) + (XDDCM(IU) - TRA(IU,IS,IA)*DERY(IUL)*      V1029870
2988.                           3SIGNN) / UUU                                                           V1029880
2989.                196        IF (QQ .GT. -0.0001 .AND. QQ .LT. 0.0001) QQ = 0.0001 * SIGN(1.,        V1029890
2990.                           1QQ)                                                                    V1029900
2991.                197        SLIP(IU,IS,IA,ILR) = (SLIPO(IU,IS,IA,ILR) - FF/QQ) * EXP(-QQ*DTT)      V1029910
2992.                           1 + FF / QQ                                                             V1029920
2993.                198        IF (SLIP(IU,IS,IA,ILR) .GT. 1.0) SLIP(IU,IS,IA,ILR) = 1.0               V1029930
2994.                199        SSS = SLIP(IU,IS,IA,ILR)                                                V1029940
2995.                200        IF (CS(IU,IS,IA,ILR) .GT. 0. .AND. ABS(SSS) .GT. 0.2)                   V1029950
2996.                           1SLIP(IU,IS,IA,ILR) = SIGN(0.2,SSS)                                     V1029960
2997.                201        SLIPO(IU,IS,IA,ILR) = SLIP(IU,IS,IA,ILR)                                V1029970
2998.                202        TLST(IU,IS,IA,ILR) = X                                                  V1029980
2999.                    C  CHECK FOR LINEAR TIRE MODELS.                                   V1029990
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   MTS          INTERNAL        ****  E N T I D Y ****
 LINE NO.       STMT NO.        INPUT LISTING

 3000.            233       350 IF (IXY .EQ. 1 .AND. CS(IU,IS,IA,ILR) .GE. 0.) GO TO 680          V1C3000C
 3001.            234       360 IF (IXY .EQ. 2 .AND. CALF(IU,IS,IA,ILR) .GE. C.) GO TO 690        V1C30010
 3002.            235           IV2S = 4                                                           V1C30020
 3003.            236           IF (IXY .EC. 1) IV2S = 1                                           V1030030
 3004.                        C  SET UP TABLE VARIABLES.                                           V1030040
 3005.            237           V1 = SLIP(IU,IS,IA,ILR)                                            V1030050
 3006.            238           SIGNX = SIGN(1.,V1)                                                V1030060
 3007.            239           V4 = ALFPRM(IU,IS,IA,ILR) * 57.2957795                             V1030070
 3008.            240           SIGNY = SIGN(1.,V4)                                                V1030080
 3009.            241           IF (IXY .EQ. 2) V1 = ALFPRM(IU,IS,IA,ILR) * 57.2957795             V1030090
 3010.            242           IF (IXY .EQ. 2) V4 = SLIP(IU,IS,IA,ILR)                            V1030100
 3011.            243           V1 = ABS(V1)                                                       V1C3C110
 3012.            244           V4 = ABS(V4)                                                       V1030120
 3013.            245           V2 = N(IU,IS,IA,ILR)                                               V1C3C130
 3014.            246           IF (DTS(IU,IS,IA,ILR) .GT. 0.) V2 = N(IU,IS,IA,ILR) / 2.           V1030140
 3015.            247           V3 = DW(IU,IS,IA,ILR)                                              V1030150
 3016.                        C  SEARCH ON FZ TABLE.                                               V1C3C160
 3017.            248           NST2 = IV2S + NTABXY(IU,IS,IA,ILR,1,IXY) - 1                       V1C3C170
 3018.            249           L2 = 0                                                             V1030180
 3019.            250           IF (V2 .GE. FZBRK(IU,IS,IA,ILR,IV2S) .AND. V2 .LT. FZBRK(IU,IS,IA,V1C3C190
 3020.                         1    ILR,NST2)) GO TO 370                                          V1030200
 3021.            251           IF (V2 .LT. FZBRK(IU,IS,IA,ILR,IV2S)) GO TO 390                    V1030210
 3022.            252           L2 = 100                                                           V1030220
 3023.            253           GO TO 390                                                          V1030230
 3024.            254       370 NLOOP = NST2 - 1                                                   V1030240
 3025.            255           DO 380 I = IV2S, NLOOP                                             V1030250
 3026.            256             L2 = I                                                           V1030260
 3027.            257             IF (V2 .GE. FZBRK(IU,IS,IA,ILR,I) .AND. V2 .LT. FZBRK(IU,IS,IA, V1C3C270
 3028.                         1      ILR,I + 1)) GO TO 390                                       V1030280
 3029.            258       380 CONTINUE                                                           V1030290
 3030.                        C  SEARCH ON V TABLE.                                                V1030300
 3031.            259       390 NST3 = NTABXY(IU,IS,IA,ILR,2,IXY)                                  V1030310
 3032.            260           L3 = 0                                                             V1030320
 3033.            261           IF (V3 .GE. VBRK(IU,IS,IA,ILR,IV2S) .AND. V3 .LT. VBRK(IU,IS,IA,   V1030330
 3034.                         1    ILR,NST3 + IV2S - 1)) GO TO 400                               V1030340
 3035.            262           IF (V3 .LT. VBRK(IU,IS,IA,ILR,IV2S)) GO TO 420                     V1030350
 3036.            263           L3 = 100                                                           V1030360
 3037.            264           GO TO 420                                                          V1030370
 3038.            265       400 NLOOP = NST3 - 1                                                   V1030380
 3039.            266           DO 410 I = 1, NLOOP                                                V1C3C39C
 3040.            267             L3 = I                                                           V1030400
 3041.            268             IF (V3 .GE. VBRK(IU,IS,IA,ILR,I + IV2S - 1) .AND. V3 .LT. VBRK( V1C3C410
 3042.                         1      IU,IS,IA,ILR,I + IV2S)) GO TO 420                           V1030420
 3043.            269       410 CONTINUE                                                           V1030430
 3044.                        C  IF INSIDE TABLE LOOP TWICE ON FZ AND TWICE ON V; OTHERWISE ONCE.  V1030440
 3045.            270       420 LOOPFZ = 2                                                         V1030450
 3046.            271           LOOPV = 2                                                          V1030460
 3047.            272           L22 = L2                                                           V1C3C470
 3048.            273           L33 = L3                                                           V1030480
 3049.            274           IF (L2 .NE. 0 .AND. L2 .NE. 100) GO TO 430                         V1030490
 3050.            275           LOOPFZ = 1                                                         V1030500
 3051.            276           L22 = IV2S                                                         V1030510
 3052.            277           IF (L2 .EQ. 100) L22 = NST2                                        V1030520
 3053.            278       430 IF (L3 .NE. 0 .AND. L3 .NE. 100) GO TO 440                         V1030530
 3054.            279           LOOPV = 1                                                          V1030540
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   MTS          INTERNAL      **** F T N T I C Y ****
LINE NO.        STMT NO.      INPUT LISTING

3055.              250           L33 = 1                                                                  V1030550
3056.              251           IF (L3 .EQ. 100) L33 = NST3                                              V1030560
3057.              252       440 IJK = 0                                                                  V1030570
3058.                        C  LOCATE LOWER INDICIAL PLANE OF BOX: LII(1)...LII(4) AND MU VALUES.       V1030580
3059.              253           DO 520 I = 1, LOOPEZ                                                     V1030590
3060.              254             DO 520 J = 1, LOOPV                                                    V1030600
3061.              255               IJK = 2 * (I - 1) + J                                                V1030610
3062.              256               I22I = L22 + I - 1                                                   V1030620
3063.              257               L33J = L33 + J - 1                                                   V1030630
3064.              258               KK = NMAXV1(IU,IS,IA,ILR,L22I,L33J)                                  V1030640
3065.              259               IF (V1 .GE. V1BRK(IU,IS,IA,ILR,L22I,L33J,1) .AND. V1 .LT.            V1030650
3066.                             1       V1BRK(IU,IS,IA,ILR,L22I,L33J,KK)) GO TO 450                      V1030660
3067.              260               LII(IJK) = 100                                                       V1030670
3068.              261               IF (V1 .LT. V1BRK(IU,IS,IA,ILR,L22I,L33J,1)) LII(IJK) = 0            V1030680
3069.              262               GO TO 480                                                            V1030690
3070.              263       450     KSTP = KK - 1                                                        V1030700
3071.              264               KSTRT = KLAST(IU,IS,IA,ILR,IXY)                                      V1030710
3072.              265       460     DO 470 K = KSTRT, KSTP                                               V1030720
3073.              266                 LL(IJK) = K                                                        V1030730
3074.              267                 LII(IJK) = K                                                       V1030740
3075.              268                 IF (V1 .GE. V1BRK(IU,IS,IA,ILR,L22I,L33J,K) .AND. V1 .LT.          V1030750
3076.                             1       V1BRK(IU,IS,IA,ILR,L22I,L33J,K + 1)) GO TO 490                   V1030760
3077.              269       470     CONTINUE                                                             V1030770
3078.              270               KSTRT = 1                                                            V1030780
3079.              271               GO TO 460                                                            V1030790
3080.              272       480     LII(IJK) = KK                                                        V1030800
3081.              273               IF (LII(IJK) .EQ. 0) LII(IJK) = 1                                    V1030810
3082.              274       490     UU(IJK) = UXY(IU,IS,IA,ILR,LII(IJK),L22I,L33J)                       V1030820
3083.              275               KLAST(IU,IS,IA,ILR,IXY) = K                                          V1030830
3084.              276               IF (LOOPV .NE. 1) GO TO 500                                          V1030840
3085.              277               UU(IJK + 1) = UU(IJK)                                                V1030850
3086.              278               LII(IJK + 1) = LII(IJK)                                              V1030860
3087.              279       500     IF (LOOPEZ .NE. 1) GO TO 510                                         V1030870
3088.              280               UU(IJK + 2) = UU(IJK)                                                V1030880
3089.              281               LII(IJK + 2) = LII(IJK)                                              V1030890
3090.              282       510     IF (LOOPV .NE. 1 .OR. LOOPEZ .NE. 1) GO TO 520                       V1030900
3091.              283               UU(IJK + 3) = UU(IJK)                                                V1030910
3092.              284               LII(IJK + 3) = LII(IJK)                                              V1030920
3093.              285       520 CONTINUE                                                                 V1030930
3094.                        C  LOCATE REMAINING 4 CORNERS OF BOX: LII(5)...LII(8) AND MU VALUES.         V1030940
3095.              286           DO 530 I = 1, 2                                                          V1030950
3096.              287             DO 530 J = 1, 2                                                        V1030960
3097.              288               L = 2 * (I - 1) + J                                                  V1030970
3098.              289               I22I = I22 + I - 1                                                   V1030980
3099.              290               L33J = L33 + J - 1                                                   V1030990
3100.              291               LII(L + 4) = LII(L)                                                  V1031000
3101.              292               IF (LII(L) .NE. 0 .AND. LL(L) .NE. 100) LII(L + 4) = LII(L) + 1V1031010
3102.              293               UU(L + 4) = UXY(IU,IS,IA,ILR,LII(L + 4),I22I,L33J)                   V1031020
3103.              294       530 CONTINUE                                                                 V1031030
3104.                        C  REDUCE BOX TO PLANE:  SLIP (IXY=1) , ALPHA (IXY=2) INTERPOLATION.         V1031040
3105.              295           DO 600 I = 1, LOOPEZ                                                     V1031050
3106.              296             DO 600 J = 1, LOOPV                                                    V1031060
3107.              297               L = 2 * (I - 1) + J                                                  V1031070
3108.              298               I22I = I22 + I - 1                                                   V1031080
3109.              299               I33J = I33 + J - 1                                                   V1031090
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MTS LINE NO. | INTERNAL STMT NO. | **** F T N T I D Y **** INPUT LISTING

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3110.          309                IF (LII(L) .NE. LII(L + 4)) GO TO 560                                  V1031100
3111.          301                UPL(L) = UU(L)                                                         V1031110
3112.                        C  CALCULATE 4 SLOPES IN SLIP (OR ALPHA) FOR SLIP-LOOP CALCULATION.        V1031120
3113.          302                IF (LI(L) .EQ. 100) GO TO 540                                          V1031130
3114.          303                XL = VIBRK(IU,IS,IA,ILR,L22I,L33J,1)                                   V1031140
3115.          304                X2 = VIBRK(IU,IS,IA,ILR,L22I,L33J,2)                                   V1031150
3116.          305                Y2 = UXY(IL,IS,IA,ILR,2,L22I,L33J)                                     V1031160
3117.          306                SLOPEE(L) = (Y2 - UU(L)) / (X2 - X1)                                   V1031170
3118.          307                GO TO 550                                                              V1031180
3119.          308          540   NMX = NMAXVI(IU,IS,IA,ILR,L22I,L33J)                                   V1031190
3120.          309                X1 = VIBRK(IU,IS,IA,ILR,L22I,L33J,NMX - 1)                             V1031200
3121.          310                X2 = VIBRK(IU,IS,IA,ILR,L22I,L33J,NMX)                                 V1031210
3122.          311                Y1 = UXY(IU,IS,IA,ILR,NMX - 1,L22I,L33J)                               V1031220
3123.          312                SLOPEE(L) = (UU(L) - Y1) / (X2 - X1)                                   V1031230
3124.          313          550   CONTINUE                                                               V1031240
3125.          314                GO TO 570                                                              V1031250
3126.          315          560   X1 = VIBRK(IU,IS,IA,ILR,L22I,L33J,LII(L))                              V1031260
3127.          316                X2 = VIBRK(IU,IS,IA,ILR,L22I,L33J,LII(L + 4))                          V1031270
3128.          317                Y2 = UU(L + 4) - UU(L)                                                 V1031280
3129.          318                SLOPEE(L) = Y2 / (X2 - X1)                                             V1031290
3130.          319                UPL(L) = UU(L) + (V1 - X1) / (X2 - X1) * Y2                            V1031300
3131.          320          570   IF (LOCPV .NE. 1) GO TO 580                                            V1031310
3132.          321                UPL(L + 1) = UPL(L)                                                    V1031320
3133.          322          580   IF (LOCPEZ .NE. 1) GO TO 590                                           V1031330
3134.          323                UPL(L + 2) = UPL(L)                                                    V1031340
3135.          324          590   IF (LOCPV .NE. 1 .OR. LOCPEZ .NE. 1) GO TO 600                         V1031350
3136.          325                UPL(L + 3) = UPL(L)                                                    V1031360
3137.          326          600 CONTINUE                                                                 V1031370
3138.                        C  REDUCE PLANE TO LINE:  (VELOCITY INTERPLCATION.)                        V1031380
3139.          327              DO 630 J = 1, 2                                                          V1031390
3140.          328                K = 2 * (J - 1) + 1                                                    V1031400
3141.          329                IF (UPL(K) .NE. UPL(K + 1)) GO TO 620                                  V1031410
3142.          330                IF (X .LE. 0.) GO TO 620                                               V1031420
3143.          331          610   SLOPI(J) = SLOPEE(K)                                                   V1031430
3144.          332                ULIN(J) = UPL(K)                                                       V1031440
3145.          333                GO TO 630                                                              V1031450
3146.          334          620   X1 = VBRK(IU,IS,IA,ILR,L33 + IV2S - 1)                                 V1031460
3147.          335                X2 = VBRK(IU,IS,IA,ILR,L33 + IV2S)                                     V1031470
3148.          336                Y2 = UPL(K + 1) - UPL(K)                                               V1031480
3149.          337                IF (X1 .EQ. X2) GO TO 610                                              V1031490
3150.          338                ULIN(J) = UPL(K) + (V3 - X1) / (X2 - X1) * Y2                          V1031500
3151.          339                SLOPI(J) = SLOPEE(K) + (V3 - X1) / (X2 - X1) * (SLOPEE(K + 1) -        V1031510
3152.                         1   SLOPEE(K))                                                             V1031520
3153.          340          630 CONTINUE                                                                 V1031530
3154.                        C  REDUCE LINE TO POINT:  (LOAD INTERPOLATION.)                            V1031540
3155.          341              IF (ULIN(1) .NE. ULIN(2)) GO TO 650                                      V1031550
3156.          342              IF (X .LE. 0.) GO TO 650                                                 V1031560
3157.          343          640 RMU = ULIN(1)                                                            V1031570
3158.          344              SLOPE2 = SLOPI(1)                                                        V1031580
3159.          345              GO TO 660                                                                V1031590
3160.          346          650 X1 = FZBRK(IU,IS,IA,ILR,L22)                                             V1031600
3161.          347              X2 = FZBRK(IU,IS,IA,ILR,L22 + 1)                                         V1031610
3162.          348              IF (X1 .EQ. X2) GO TO 640                                                V1031620
3163.          349              RMU = ULIN(1) + (V2 - X1) / (X2 - X1) * (ULIN(2) - ULIN(1))              V1031630
3164.                        C SLOPE2 IS FINAL INTERPOLATED SLOPE FOR USE IN SLIP CALCULATION. (IXY=1)   V1031640
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   MTS          INTERNAL        **** F T N T I D Y ****
 LINE NO.       STMT NO.        INPUT LISTING

3165.             350              SLOPE2 = SLOPI(I) + (V2 - X1) / (X2 - X1) * (SLOPI(2) - SLOPI(1))  V1031650
3166.             351           660 IF (IXY .EQ. 1) SLOPE(IU,IS,IA,ILR) = SLOPE2                       V1031660
3167.             352               IF (IXY .EQ. 2) SLOPEY(IU,IS,IA,ILR) = SLOPE2 * RADIAN             V1031670
3168.             353               IF (X .EQ. 0.) SLOPYO(IU,IS,IA,ILR) = SLOPEY(IU,IS,IA,ILR)         V1031680
3169.                           C                                                                      V1031690
3170.                           C  ROLL-OFF CALCULATION: RMU=RMU*ROLLX (IXY=1); RML=RML*ROLLY (IXY=2).  V1031700
3171.                           C  ROLLX AND ROLLY ARE RETURNED FROM 2-DIM TABLE LOOK-UP DEFINED BY     V1031710
3172.                           C  XYROLX,XYROLY AS FUNCTIONS OF LONGITUDINAL AND LATERAL SLIP.         V1031720
3173.                           C                                                                      V1031730
3174.             354               IF (IXY .EQ. 2) GO TO 670                                           V1031740
3175.             355               N1N1 = N1ROLX(IU,IS,IA,ILR)                                         V1031750
3176.             356               N2N2 = N2ROLX(IU,IS,IA,ILR)                                         V1031760
3177.             357               CALL TABLXY(1, N1N1, 1, N2N2, X1ROLX(1,IU,IS,IA,ILR), V1,           V1031770
3178.                              1      X2ROLX(1,IU,IS,IA,ILR), V4, XYROLX(1,1,IU,IS,IA,ILR), 10,     V1031780
3179.                              2      ROLLX)                                                       V1031790
3180.             358               RML = RMU * ROLLX                                                   V1031800
3181.             359               RMUO(IU,IS,IA,ILR) = RMU                                            V1031810
3182.             360               FXW(IU,IS,IA,ILR) = -RMU * N(IU,IS,IA,ILR) * SIGNX                  V1031820
3183.             361               RETURN                                                              V1031830
3184.             362           670 N1N1 = N1ROLY(IL,IS,IA,ILR)                                         V1031840
3185.             363               N2N2 = N2ROLY(IU,IS,IA,ILR)                                         V1031850
3186.             364               CALL TABLXY(1, N1N1, 1, N2N2, X1POLY(1,IU,IS,IA,ILR), V4,           V1031860
3187.                              1      X2ROLY(1,IU,IS,IA,ILR), V1, XYROLY(1,1,IU,IS,IA,ILR), 10,     V1031870
3188.                              2      ROLLY)                                                       V1031880
3189.             365               RMU = RMU * ROLLY                                                   V1031890
3190.             366               FYW(IU,IS,IA,ILR) = -RMU * N(IU,IS,IA,ILR) * SIGNY                  V1031900
3191.             367               FYW(IU,IS,IA,ILR) = FYW(IU,IS,IA,ILR) + CAM(IU,IS,IA,ILR) * (       V1031910
3192.                              1THETAX(IU,IS,IA) - CZOYO)                                           V1031920
3193.                           C                                                                      V1031930
3194.                           C                                                                      V1031940
3195.             368               TALIGN(IU,IS,IA,ILR) = -CAT(IU,IS,IA,ILR) * FYW(IU,IS,IA,ILR) /     V1031950
3196.                              1SLOPYO(IU,IS,IA,ILR) / NS(IU,IS,IA) * 2.                            V1031960
3197.             369               IF (DTS(IU,IS,IA,ILR) .GT. 0.) TALIGN(IU,IS,IA,ILR) = 2. * TALIGN(V1031970
3198.                              1IU,IS,IA,ILR)                                                       V1031980
3199.                           C                                                                      V1031990
3200.             370               QUALTO(IU,IS,IA,ILR) = -SLOPE2 * N(IU,IS,IA,ILR) / 2. * (DTS(IU,    V1032000
3201.                              1IS,IA,ILR)) ** 2 * PBAR(IVEH,3) / UBAR(IVEH,1) / 2.                 V1032010
3202.                           C                                                                      V1032020
3203.                           C                                                                      V1032030
3204.             371               RETURN                                                              V1032040
3205.                           C  LINEAR TIRE MODELS.                                                 V1032050
3206.             372           680 FXW(IU,IS,IA,ILR) = -CS(IU,IS,IA,ILR) * SLIP(IU,IS,IA,ILR) * N(IU,V1032060
3207.                              1IS,IA,ILR) * 2. / NS(IU,IS,IA)                                      V1032070
3208.             373               SLOPE(IU,IS,IA,ILR) = CS(IU,IS,IA,ILR) * 2. / NS(IU,IS,IA)          V1032080
3209.             374               RML(IU,IS,IA,ILR) = ABS(FXW(IU,IS,IA,ILR)) / N(IU,IS,IA,ILR)        V1032090
3210.             375               RETURN                                                              V1032100
3211.             376           690 FYW(IU,IS,IA,ILR) = -CALF(IU,IS,IA,ILR) * ALFPRM(IU,IS,IA,ILR) *    V1032110
3212.                              1N(IL,IS,IA,ILR) * 2. / NS(IU,IS,IA)                                 V1032120
3213.             377               FYY = FYW(IU,IS,IA,ILR)                                             V1032130
3214.             378               IF (ABS(FYY) .GT. NS(IU,IS,IA)) FYW(IL,IS,IA,ILR) = SIGN(1.,FYY) *V1032140
3215.                              1 NS(IU,IS,IA)                                                       V1032150
3216.             379               FYW(IU,IS,IA,ILR) = FYW(IU,IS,IA,ILR) + CAM(IL,IS,IA,ILR) * (       V1032160
3217.                              1THETAX(IU,IS,IA) - CZOYO)                                           V1032170
3218.             380               SLOPEY(IU,IS,IA,ILR) = CALF(IU,IS,IA,ILR) * 2. / NS(IU,IS,IA)       V1032180
3219.             381               TALIGN(IU,IS,IA,ILR) = -CAT(IU,IS,IA,ILR) * FYW(IU,IS,IA,ILR) /     V1032190
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MTS      INTERNAL     **** P R I N T E D Y ****
LINE NO. STMT NO.     INPUT LISTING

3220.                 SCALE(IU,IS,IA,ILR)                                                    V1032200
3221.          382    IF (DTS(IU,IS,IA,ILR) .LE. 0.) RETURN                                  V1032210
3222.          383    TALIGN(IU,IS,IA,ILR) = 2. * TALIGN(IU,IS,IA,ILR)                       V1032220
3223.          384    DUALTQ(IU,IS,IA,ILR) = -CS(IU,IS,IA,ILR) * (DTS(IU,IS,IA,ILR)) ** **  V1032230
3224.                 12 * PBAR(IVEH,3) / UBAR(IVEH,1) / 2.                                  V1032240
3225.          385    RETURN                                                                 V1032250
3226.          386    END                                                                    V1032260
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES						
ABS	(R*4)	FCN	179	182	200	213	214	374	378
ATAN	(R*4)	FCN	180						
COS	R*4	FCN	161	162	165	169	173	178	
EXP	(R*4)	FCN	197						
ROAD		SUBR	171						
ROADDZ		SUBR	172						
SIGN	(R*4)	FCN	182	195	196	200	208	213	378
SIN	(R*4)	FCN	161	162	169	173	178		
SQRT	(R*4)	FCN	125						
TABDIR		SUBR	61	63	67	69			
TABLXY		SUBR	357	364					
TIRE	(R*4)	ENTRY	1540						
TIRINI		SUBR	10						
<EXIT>		SUBR	132	361	371	375	382	385	

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES										
ALFA	(R*4)			181*	182?									
ALFRPM	(R*4)	ARRAY	TIRES	110	180*	181	182*	209	211	376				
APHI	(R*4)	ARRAY	SPMASS	130										
ASM	(R*4)	ARRAY	UNSPM	120										
ASW	(R*4)	ARRAY	UNSPM	120	125									
AUXROL	(R*4)	ARRAY	UNSPM	120										
AXDFLT	(R*4)	ARRAY	UNSPM	120	177									
AXLE	R*8	ARRAY		30	350	39	100	101						
A3	(R*4)	ARRAY	SPMASS	130										
BB1	(R*4)	ARRAY	SPMASS	130										
C	(R*4)	ARRAY	UNSPM	120										
CALF	(R*4)	ARRAY	TIRES	110	58*	59*	60	61	62	63	89	90	103	104	123*
				182	204	376	380	381						
CAM	(R*4)	ARRAY		230	70*	71*	93	107	130*	367	379			
CAT	(R*4)	ARRAY	TIRES	110	72*	73*	94	108	129*	368	381			
CF	(R*4)	ARRAY	UNSPM	120										
CS	(R*4)	ARRAY	TIRES	110	64*	65*	66	67	68	69	91	92	105	106	126*
				200	203	372	373	384						
CST	(R*4)	ARRAY		200	125*	174								
D	(R*4)	ARRAY	SPMASS	130										
DBX	(R*4)	ARRAY	CMACC	170										
DBY	(R*4)	ARRAY	CMACC	170										
DEFSPR	(R*4)	ARRAY	SPRING	70										
DELPIN	(R*4)		PIN	140										
DELT	(R*4)	ARRAY	TURN	80	178?	180								
DELTA	(R*4)	ARRAY	SPMASS	130	176									
DERY	(R*4)	ARRAY		220	154	192	195							
DT	(R*4)	ARRAY		210	154									
DTC	(R*4)			120*	122*	123	124	126	128	130				
DTHAX	(R*4)	ARRAY	SPRING	70										
DTS	(R*4)	ARRAY	TIRES	110	42*	43*	56*	57*	88	102	121*	122	216	369	370
				382	384									
DTT	(R*4)			186*	187	197								
DUALTQ	(R*4)	ARRAY	DUAL	300	46*	370*	384*							
DUMM	(R*4)			191*	193	195								

202

DV	(R*4)	ARRAY	SPRING	7C									
DZAXLE	(R*4)	ARRAY	SPRING	7C									
DZDX	(R*4)			172?	173								
DZDXO	(R*4)		ROADD	9C	168	169							
DZDY	(R*4)			172?	173*								
DZDYO	(R*4)			40*	169*	367	379						
DZDYO	(R*4)		ROADD	9C	168	169							
EE	(R*4)			195*	197								
EORSPR	(R*4)	ARRAY	SPRING	7C									
EPIN	(R*4)	ARRAY	PIN	14C									
EPINX	(R*4)	ARRAY	PIN	14C									
EPINY	(R*4)	ARRAY	PIN	14C									
ET	(R*4)	ARRAY	STATIC	6C									
EX	(R*4)	ARRAY		21D									
EXT	(R*4)	ARRAY	TIRES	11C									
EXW	(R*4)	ARRAY	TIRES	11C	360*	372*	374?						
EYT	(R*4)	ARRAY	TIRES	11C									
EYW	(R*4)	ARRAY	TIRES	11C	366*	367*	368	376*	377	378*	379*	381	
EYY	(R*4)			377*	378?								
FZBRK	(R*4)	ARRAY	TIRTAB	31C	220	221	227	346	347				
HEAD	(R*4)	ARRAY	PAGE	4C									
I	(I*4)			119*	121	122	123	124	125	126	127	128	129	130	225*
				226	227	236*	237	239	253*	255	256	286*	288	289	295*
				297	298										
IA	(I*4)			154	157	161	162	181	182	186	189	191	193	194	195
				197	198	199	200	201	202	203	204	207	209	211	212
				215	216	217	218	220	221	227	229	231	232	238	258
				259	261	264	268	274	275	293	303	304	305	308	309
				310	311	315	316	334	335	346	347	351	352	353	355
				356	357	359	360	362	363	364	366	367	368	369	370
				372	373	374	376	377	378	379	380	381	382	383	384
IDM	(I*4)			164*	165										
IJ	(I*4)			86*	87*	100*	101*								
IJK	(I*4)			252*	255*	260	261	266	267	272	273	274	277	278	280
				281	283	284									
IK	(I*4)			86*	87*	100*	101*								
ILR	(I*4)			154	158	159	181	182	186	189	191	193	194	195	197
				198	199	200	201	202	203	204	207	209	211	212	215
				216	217	218	220	221	227	229	231	232	238	258	259
				261	264	268	274	275	293	303	304	305	308	309	310
				311	315	316	334	335	346	347	351	352	353	355	356
				357	359	360	362	363	364	366	367	368	369	370	372
				373	374	376	377	378	379	380	381	382	383	384	
IROAD	(I*4)		ROADD	9C	160	167									
IS	(I*4)			154	156	161	162	181	182	186	189	191	193	194	195
				197	198	199	200	201	202	203	204	207	209	211	212
				215	216	217	218	220	221	227	229	231	232	238	258
				259	261	264	268	274	275	293	303	304	305	308	309
				310	311	315	316	334	335	346	347	351	352	353	355
				356	357	359	360	362	363	364	366	367	368	369	370
				372	373	374	376	377	378	379	380	381	382	383	384
ITN	(I*4)			81*	87	101									
IU	(I*4)			154	155	161	162	163	164	169	173	181	182	186	189
				191	192	193	194	195	197	198	199	200	201	202	203
				204	207	209	211	212	215	216	217	218	220	221	227
				229	231	232	238	258	259	261	264	268	274	275	293
				303	304	305	308	309	310	311	315	316	334	335	346
				347	351	352	353	355	356	357	359	360	362	363	364

			366	367	368	369	370	372	373	374	376	377	378	379
			380	381	382	383	384							
IOU	(I*4)		192*	193	195									
IV	(I*4)		61?	63?	67?	69?	82*	83*	84*	86	87	100	101	
IVEH	(I*4)		1	46	47	48	49	50	51	52	54	55	57	58
			59	60	61?	62	63?	64	65	66	67?	68	69?	70
			71	72	73	74	75	76	77	78	79	81	84	85
			86	87	88	89	90	91	92	93	94	95	96	97
			100	101	102	103	104	105	106	107	108	109	110	111
			115	117	118	121	122	123	124	125	126	127	128	129
			130	155*	174	175	176	177	178	180	185	370	384	
IV2S	(I*4)		205*	206*	218	220	221	225	231	232	238	246	334	335
IXY	(I*4)		154	184	203	204	206	211	212	218	229	264	275	351
			352	354										
J	(I*4)		254*	255	257	287*	288	290	296*	297	299	327*	328	331
			332	338	339									
JA	R*4	ARRAY UNSPM	5D	12C										
JKK	(I*4)		53*	54*	55									
JS	(I*4)		61?	63?	67?	69?								
JSUS	(I*4)		1	46	47	48	49	50	51	52	54	56*	57	58*
			59	60	61?	62	63?	64*	65	66	67?	68	69?	70*
			71	72*	73	74*	75	76*	77	78*	79	85	86	87
			88	89	90	91	92	93	94	95	96	97	100	101
			102	103	104	105	106	107	108	109	110	111	115	117
			118	121	122	123	124	125	126	127	128	129	130	156*
			174	175	176	177	178	180	185					
K	(I*4)		45*	46	47	48	49	50	51	52	116*	117	121	122
			123	124	125	126	127	128	129	130	265*	266	267	268
			275	328*	329	331	332	336	338	339				
KA	(I*4)		61?	63?	67?	69?								
KAX	(I*4)		55*	56*	57	58*	59	60	61?	62	63?	64*	65	66
			67?	68	69?	70*	71	72*	73	74*	75	76*	77	78*
			79	102*	103*	105*	107*	108*	109*	110*	111*	157*	174	175
			176	177	178	180	185							
KDOLLY	(I*4)	ARRAY KEY	16C											
KEY	(I*4)	ARRAY KEY	16C	54	85	115								
KK	(I*4)		258*	259	263	272								
KKK	R*4	ARRAY UNSPM	5D	12C										
KLAST	(I*4)	ARRAY	24D	33	264	275*								
KRS	(I*4)	ARRAY UNSPM	12C											
KSTP	(I*4)		263*	265										
KSTRT	(I*4)		264*	265	270*									
KT	R*4	ARRAY TIPES	5D	11C	74*	75*	95	109	124*	125	174			
L	(I*4)		44*	46	47	48	49	50	51	52	288*	291	292	293
			297*	300	301	302	306	312	315	316	317	318	319	321
			323	325										
LOOPEZ	(I*4)		240*	245*	253	275	282	295	322	324				
LOOPV	(I*4)		241*	249*	254	276	282	296	320	324				
LS	(I*4)		61?	63?	67?	69?								
LSIDE	(I*4)		56*	59*	64*	70*	72*	74*	76*	78*	88*	89*	91*	93*
			94*	95*	96*	97*	102*	103*	105*	107*	108*	109*	110*	111*
			158*	174	175	178	180	185						
L1	(I*4)	ARRAY	26C	32	260*	261*	266*	273	292	302				
L11	(I*4)	ARRAY	26D	267*	272*	273*	274	278*	281*	284*	291*	292*	293	300
			315	316										
L2	(I*4)		219*	222*	226*	242	244	247						
L22	(I*4)		242*	246*	247*	256	280	298	346	347				
L221	(I*4)		256*	259	259	261	268	274	289*	293	298*	303	304	305

L3	(I*4)			
L33	(I*4)			
L33J	(I*4)			
MCS	(I*4)			SPMASS
MVEH	(I*4)			KEY
MZ	R*4	ARRAY		
N	R*4	ARRAY		TIRES
NDUM	(I*4)			
NLOOP	(I*4)			
NMAXVI	(I*4)	ARRAY		TIRTAB
NMX	(I*4)			
NOSPR	(I*4)	ARRAY		SPRING
NOTURN	(I*4)	ARRAY		TURN
NP	(I*4)			PAGE
NS	R*4	ARRAY		STATIC
NST2	(I*4)			
NST3	(I*4)			
NTABXY	(I*4)	ARRAY		TIRTAB
NINT	(I*4)			
NIROLX	(I*4)	ARRAY		TIRTAB
NIROLY	(I*4)	ARRAY		TIRTAB
N2N2	(I*4)			
N2ROLX	(I*4)	ARRAY		TIRTAB
N2ROLY	(I*4)	ARRAY		TIRTAB
PBAR	(R*4)	ARRAY		ECTOUT
PH	(R*4)	ARRAY		SPMASS
PHIBAR	(R*4)	ARRAY		ECTOUT
PJ	(R*4)	ARRAY		SPMASS
PSIDD	(R*4)	ARRAY		CMACC
PSIDDL	(R*4)	ARRAY		PIN
PW	(R*4)	ARRAY		SPMASS
PX	(R*4)	ARRAY		SPMASS
PZ	(R*4)	ARRAY		SPMASS
QQ	(R*4)			
R	I*4			PAGE
RADIAN	(R*4)			
RCI	(R*4)	ARRAY		UNSPM
RMU	(R*4)			
RMUO	(R*4)	ARRAY		
ROLLX	(R*4)			
ROLLY	(R*4)			
RST	(R*4)	ARRAY		UNSPM
S	(R*4)	ARRAY		SPRING
SD	(R*4)	ARRAY		SPRING
SF	(R*4)	ARRAY		STATIC
SIDE	(R*4)	ARRAY		
SIGNN	(R*4)			
SIGNX	(R*4)			
SIGNY	(R*4)			
SLIP	(R*4)	ARRAY		TIRES
SLIPO	(R*4)	ARRAY		
SLOPE	(R*4)	ARRAY		
SLOPEF	(R*4)	ARRAY		
SLOPEY	(R*4)	ARRAY		SLOPES
SLOPE2	(R*4)			

308 309 310 311 315 316
230* 233* 237* 243 248 251
243* 250* 251* 257 290 299 334 335
257* 258 259 261 268 274 290* 293 299* 303 304 305
308 309 310 311 315 316
130
160 83
50 210
50 110 174* 175* 191 215 216 360 366 370 372 374
376
115* 116
224* 225 235* 236
310 258 308
308* 309 310 311
70
80
40
50 60 174 368 372 373 376 378 380
218* 220 224 247
229* 231 235 251
310 218 229
355* 357? 362* 364?
310 355
310 362
356* 357? 363* 364?
310 356
310 363
150 176 177 370 384
130
150 161? 162? 165? 169? 173?
130
170
140 165?
130
130
130
193* 196* 197
20 40 56R 58R 64R 70R 72R 74R 76R 78R
34 123 129 130 352
120 176
343* 349* 358* 359 360 365* 366
280 49* 195 359* 374*
357? 358
364? 365
120
70
70
60
350 38 86 87 100 101
159* 161 162 177 193 195
208* 360
210* 366
110 47* 189* 194 197* 198* 199 200* 201 207 212 372
280 48* 199 195 197 201*
210 50* 193 195 351* 373*
270 306* 312* 318* 331 339
100 352* 353 380*
344* 350* 351 352 370

SLOPYO	(R*4)	ARRAY		25C	51*	353*	368							
SLOPI	(R*4)	ARRAY		27C	331*	339*	344	353						
SNL	(R*4)	ARRAY	SPMASS	13C										
SRAD	(R*4)	ARRAY	TIRES	11C	76*	77*	96	113	127*	191	195			
SRS	(R*4)	ARRAY		21C	154									
SSS	(R*4)			194*	195?	199*	200?							
SYT	(R*4)	ARRAY	UNSPM	12C										
T	(R*4)	ARRAY		21C	154	195								
TALIGN	(R*4)	ARRAY		25C	154	369*	369*	381*	383*					
TFORAX	(R*4)	ARRAY	PIN	14C										
TFORAY	(R*4)	ARRAY	PIN	14C										
TFORAZ	(R*4)		PIN	14C										
TFORBX	(R*4)	ARRAY	PIN	14C										
TFORBY	(R*4)	ARRAY	PIN	14C										
TFORBZ	(R*4)		PIN	14C										
THETAX	(R*4)	ARRAY	SPRING	7C	367	379								
TIRES	(R*4)	ARRAY		35D	37	96	87	109	101					
TLST	(R*4)	ARRAY		28D	52*	186	202*							
TN	(R*4)			60*	61?	62*	63?	66*	67?	68*	69?			
TOL	(R*4)	ARRAY	SPMASS	13C	165									
TRA	(R*4)	ARRAY	UNSPM	12C	161	162	177	193	195					
TSUM	(R*4)	ARRAY	TIRES	11C										
TURNX	(R*4)	ARRAY	TURN	8C										
TURNY	(R*4)	ARRAY	TURN	9C										
UBAR	(R*4)	ARRAY	ECTOUT	15C	176	177	370	384						
UI	(R*4)			177*	179	179?	180							
ULIN	(R*4)	ARRAY		29D	332*	338*	341	343	349					
UPL	(R*4)	ARRAY		29D	301*	319*	321*	323*	325*	329	332	336	338	
UU	(R*4)	ARRAY		29D	274*	277*	280*	283*	293*	301	306	312	317	319
UUU	(R*4)			185*	188	191	193	195						
UW	(R*4)	ARRAY	WSPC	19C	178*	185	217							
UXY	(R*4)	ARRAY	TIRTAB	31C	274	293	305	311						
VBRK	(R*4)	ARRAY	TIRTAB	31C	231	232	238	334	335					
VEH	(R*4)	ARRAY		35D	36	86	87	100	101					
VI	(R*4)			176*	178	180								
VJ	(R*4)	ARRAY	SPMASS	13C										
VW	(R*4)	ARRAY	SPMASS	13C										
VI	(R*4)			207*	208?	211*	213*	259	261	268	319	357?	364?	
VIRRK	(R*4)	ARRAY	TIRTAB	31C	259	261	268	303	304	309	310	315	316	
V2	(R*4)			215*	216*	220	221	227	349	350				
V3	(R*4)			217*	231	232	238	338	339					
V4	(R*4)			209*	210?	212*	214*	357?	364?					
W	I*4		PAGE	20	4C	96k	87W	88W	89k	90W	91W	92W	93W	94k	95W
				96W	97W	100k	101k	102W	103k	104k	105W	106W	107W	108W	109W
				110k	111W									
WHBS	(R*4)	ARRAY	SPMASS	13C										
WHEELI	(R*4)	ARRAY	WHEEL	18C	78*	79*	97	111	128*	191	195			
X	(R*4)			154	171?	186	202	330	342	353				
XAXFOR	(R*4)	ARRAY	TIRES	11C										
XBACK	(R*4)	ARRAY	ROADD	8C	165									
XBAR	(R*4)	ARRAY	ECTOUT	15C	161	162								
XDOOM	(R*4)	ARRAY	CMASS	17C	193	195								
XFRONT	(R*4)	ARRAY	ROADD	9C	165									
XLOAD	(R*4)	ARRAY	SPRING	7C										
XMOM	(R*4)		PIN	14C										
XROAD	(R*4)			141*	165*	168	171?	172?						
XXS	(R*4)	ARRAY		21C	154	161	162	176						
XYPOLY	(R*4)	ARRAY	TIRTAB	31C	357?									

XYROLY	(R*4)	ARRAY TIRTAB	31C	364?								
XL	(R*4)		303*	306	309*	312	315*	318	319	334*	337	338	339	346*
			348	349	350									
XLROLX	(R*4)	ARRAY TIRTAB	31C	357?								
XLROLY	(R*4)	ARRAY TIRTAB	31C	364?								
X2	(R*4)		304*	306	310*	312	316*	318	319	335*	337	338	339	347*
			348	349	350									
X2ROLX	(R*4)	ARRAY TIRTAB	31C	357?								
X2ROLY	(R*4)	ARRAY TIRTAB	31C	364?								
YAXLCP	(R*4)	ARRAY TIRES	11C									
YDDCM	(R*4)	ARRAY CMACC	17C									
YN	(R*4)		61?	63?	67?	69?						
YROAD	(R*4)		162*	168	171?	172?						
YT	(R*4)	ARRAY TIRES	11C	174								
YTD	(R*4)	ARRAY TIRES	11C	174								
Y1	(R*4)		311*	312								
Y2	(R*4)		305*	306	317*	318	319	336*	338			
ZAXLE	(R*4)	ARRAY SPRING	7C									
ZROAD	(R*4)		41*	168*	171?	174						
ZO	(R*4)	ARRAY SPRING	7C									
1			88	89	91	93	94	95	96	97		

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES							
10	52		44	45						
20	80		55							
30	99		85							
40	112	FMT	94							
50	113	FMT	108							
60	114		98							
70	131		116	117	118	119				
80	133	FMT								
90	134	FMT	56	58	64	70	72	74	76	78
100	135	FMT	86							
110	136	FMT	87							
120	137	FMT	100							
130	138	FMT	101							
140	139	FMT	88							
150	140	FMT	102							
160	141	FMT	89							
170	142	FMT	103							
180	143	FMT	90	92	104	106				
190	144	FMT	91							
200	145	FMT	105							
210	146	FMT	95							
220	147	FMT	109							
230	148	FMT	96							
240	149	FMT	110							
250	150	FMT	97							
260	151	FMT	111							
270	152	FMT	93							
280	153	FMT	107							
290	166		164							
300	167		163							
310	171		167							
320	174		169	173						

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330     183                     179
340     191                     188
350     203                     187     190
360     204                     184
370     224                     220
380     229                     225
390     229                     221     223     227
400     235                     231
410     239                     236
420     240                     232     234     238
430     248                     244
440     252                     248
450     263                     259
460     265                     271
470     269                     265
480     272                     262
490     274                     268
500     279                     276
510     282                     279
520     285                     253     254     282
530     294                     286     287
540     308                     302
550     313                     307
560     315                     309
570     320                     314
580     322                     320
590     324                     322
600     326                     295     296     324
610     331                     337
620     334                     329     330
630     340                     327     333
640     343                     348
650     346                     341     342
660     351                     345
670     362                     354
680     372                     203
690     376                     204

TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
       TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION
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  MTS          INTERNAL       **** F T N T I C Y ****
LINE NO.       STMT NO.       INPUT LISTING

3227.                    C                                                                    V1032270
3228.                    C    *** SUBROUTINE BRAKE1 ***                                       V1032280
3229.                    C                                                                    V1032290
3230.                1           SUBROUTINE BRAKE1(IVEH)                                      V1032300
3231.                2           REAL*8 AXLE                                                  V1032310
3232.                3           INTEGER R, W                                                 V1032320
3233.                4           REAL N, KT                                                   V1032330
3234.                5           COMMON /PAGE/ NP, HEAD(20), R, W                             V1032340
3235.                6           COMMON /ECTOUT/ XBAR(4,3), PHIBAR(4,3), UBAR(4,3), PBAR(4,3) V1032350
3236.                7           COMMON /CMACC/ XDDCM(4), YDDCM(4), PSIDD(4), DBX(4), DBY(4)  V1032360
3237.                8           COMMON /ANTLK/ IALOPT(32), IOP(32), ILOCK                    V1032370
3238.                9           COMMON /KEY/ MVEH, KEY(4,2), KDELLY(4)                       V1032380
3239.               10           COMMON /WSED/ UW(4,2,2,2)                                    V1032390
3240.               11           COMMON /BRAKE/ BTQ(4,2,2,2), TQ(4,2,2,2,2), NUM(4,2,2,2,2),  V1032400
3241.                           1       XX(4,320), YY(4,320), NTP(1,2), XTP(10), YTP(10), IBK V1032410
3242.               12           COMMON /TIRES/ SRAD(4,2,2,2), CALF(4,2,2,2), FTS(4,2,2,2),   V1032420
3243.                           1       KT(4,2,2,2), CS(4,2,2,2), N(4,2,2,2), CAT(4,2,2,2),  V1032430
3244.                           2       YT(4,2,2,2), YTD(4,2,2,2), TSUM(4,3), XAXFOR(4,2,2),  V1032440
3245.                           3       YAXFOR(4,2,2), FYI(4,2,2,2), FXI(4,2,2,2), FXW(4,2,2,2), V1032450
3246.                           4       FYW(4,2,2,2), ALFPRM(4,2,2,2), SLIP(4,2,2,2)         V1032460
3247.               13           COMMON /BOUT/ P(4,2,2,2), PO(4,2,2,2), TLST(4,2,2,2), T(4,2,2,2), V1032470
3248.                           1       PTRD                                                 V1032480
3249.               14           DIMENSION XXS(4,2,2)                                         V1032490
3250.               15           DIMENSION DUMX(25), DUMY(25)                                 V1032500
3251.               16           DIMENSION VEH(2,3), TIRES(3,2), SIDE(2,2), AXLE(3,2)         V1032510
3252.               17           DIMENSION BRAKE(4,2)                                         V1032520
3253.               18           DATA BRAKE /' FRO', 'NT L', 'RAKE', 'S   ', ' REA', 'R BR',  V1032530
3254.                           1     'AKES', '    '/                                        V1032540
3255.               19           DATA VEH /' TRA', 'CTOR', ' TRA', 'ILER', ' TRU', 'CK  '/    V1032550
3256.               20           DATA TIRES /' FRO', 'NT T', 'IRES', ' REA', 'R TI', 'RES'/   V1032560
3257.               21           DATA SIDE /'LEFT', ' SID', 'E   ', 'RIGH', 'T SI', 'DE  '/   V1032570
3258.               22           DATA AXLE /'LEADING ', 'TANDEM A', 'XLE     ', 'TRAILING',  V1032580
3259.                           1     ' TANDEM ', 'AXLE    '/                                V1032590
3260.                    C                                                                    V1032600
3261.                    C   BRAKE PARAMETERS                                                 V1032610
3262.                    C                                                                    V1032620
3263.                    C   READ IN LINE PRESSURE CHARACTERISTICS FIRST... IF ITQ(1) .LT. 0, V1032630
3264.                    C   NO BRAKES ARE USED FOR ANY OF THE VEHICLES, THUS NO BRAKE PARAMETERSV1032640
3265.                    C   NEED BE ENTERED.                                                V1032650
3266.                    C                                                                    V1032660
3267.               23           IF (IBK .EQ. 1 .AND. IVEH .EQ. 2) NP = NP + 1               V1032670
3268.               24           IF (IBK .EQ. 1) WRITE (W,10)                                 V1032680
3269.               25       10 FORMAT ('0*** ZERO LINES IN TREADLE PRESSURE TABLE INDICATES NO ',V1032690
3270.                           1       'BRAKING ***'/'*** THREE BRAKE PARAMETERS PER AXLE ARE ', V1032700
3271.                           2       'DELETED AT THIS POINT ***')                         V1032710
3272.               26           IF (IBK .EQ. 1) RETURN                                       V1032720
3273.               27           DO 30 JS = 1, 2                                              V1032730
3274.               28             DO 30 KA = 1, 2                                            V1032740
3275.               29               DO 20 LS = 1, 2                                          V1032750
3276.               30                 T(IVEH,JS,KA,LS) = 0.                                V1032760
3277.               31                 TLST(IVEH,JS,KA,LS) = 0.                             V1032770
3278.               32           20    PO(IVEH,JS,KA,LS) = 0.                               V1032780
3279.               33       30  CONTINUE                                                     V1032790
3280.                    C                                                                    V1032800
3281.               34           DO 120 JSUS = 1, 2                                           V1032810
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   MTS          INTERNAL       ****  F T N T I C Y ****
 LINE NO.       STMT NO.       INPUT LISTING

3282.              35             IF (IVEH .EQ. 2 .AND. JSUS .EQ. 1) GO TO 120                          V1032820
3283.              36             JKK = 1                                                               V1032830
3284.              37             IF (KEY(IVEH,JSUS) .GT. 0) JKK = 2                                    V1032840
3285.              38             DO 80 KAX = 1, JKK                                                    V1032850
3286.              39               DO 40 IJ = 1, 2                                                     V1032860
3287.              40                 READ (R,130) (TQ(IVEH,JSUS,KAX,LSIDE,IJ),LSIDE=1,2)              V1032870
3288.              41                 IF (TQ(IVEH,JSUS,KAX,2,IJ) .EQ. 0.) TQ(IVEH,JSUS,KAX,2,IJ) =V1032880
3289.                1                 TQ(IVEH,JSUS,KAX,1,IJ)                                          V1032890
3290.              42           40    CONTINUE                                                          V1032900
3291.              43             READ (R,140) (BTQ(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2)                     V1032910
3292.              44             IF (BTQ(IVEH,JSUS,KAX,2) .EQ. 0.) BTQ(IVEH,JSUS,KAX,2) = BTQ(      V1032920
3293.                1            IVEH,JSUS,KAX,1)                                                    V1032930
3294.                      C                                                                           V1032940
3295.                      C    FOR BRAKE TABLES                                                       V1032950
3296.                      C                                                                           V1032960
3297.              45              DO 80 LSIDE = 1, 2                                                   V1032970
3298.              46                IF (BTQ(IVEH,JSUS,KAX,LSIDE) .GE. 0.) GO TO 80                     V1032980
3299.              47                IN = BTQ(IVEH,JSUS,KAX,LSIDE)                                      V1032990
3300.              48                CALL TABDIR(IN, IVEH, JSUS, KAX, LSIDE, IV, JS, KA, LS, YN,        V1033000
3301.                1                    4)                                                          V1033010
3302.              49                IF (YN .EQ. 0.) GO TO 50                                           V1033020
3303.              50                NUM(IVEH,JSUS,KAX,LSIDE,1) = NUM(IV,JS,KA,LS,1)                   V1033030
3304.              51                NUM(IVEH,JSUS,KAX,LSIDE,2) = NUM(IV,JS,KA,LS,2)                   V1033040
3305.              52                GO TO 80                                                           V1033050
3306.              53           50   IK = 80 * (IVEH - 1) + 40 * (JSUS - 1) + 20 * (KAX - 1) +         V1033060
3307.                1               10 * (LSIDE - 1) + 1                                             V1033070
3308.              54                NUM(IVEH,JSUS,KAX,LSIDE,1) = IK                                    V1033080
3309.              55                READ (R,60) NUB                                                    V1033090
3310.              56           60   FORMAT (I2)                                                        V1033100
3311.              57                NUM(IVEH,JSUS,KAX,LSIDE,2) = IK + NUB - 1                          V1033110
3312.              58                IKK = IK + NUB - 1                                                 V1033120
3313.              59                DO 70 II = IK, IKK                                                 V1033130
3314.              60           70   READ (R,140) XX(IVEH,II), YY(IVEH,II)                              V1033140
3315.              61           80 CONTINUE                                                             V1033150
3316.                      C                                                                           V1033160
3317.                      C    ECHO                                                                   V1033170
3318.                      C                                                                           V1033180
3319.              62              ITN = IVEH - 1                                                       V1033190
3320.              63              IV = 1                                                               V1033200
3321.              64              IF (MVEH .EQ. 1) IV = 3                                              V1033210
3322.              65              IF (IVEH .GE. 2) IV = 2                                              V1033220
3323.              66              IF (KEY(IVEH,JSUS) .GT. 0) GO TO 90                                  V1033230
3324.              67              IF (IVEH .EQ. 1) WRITE (W,150) (VEH(IJ,IV),IJ=1,2),                  V1033240
3325.                1             (BRAKE(IJ,JSUS),IJ=1,4), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)               V1033250
3326.              68              IF (IVEH .GT. 1) WRITE (W,160) (VEH(IJ,IV),IJ=1,2), ITN,             V1033260
3327.                1             (BRAKE(IJ,JSUS),IJ=1,4), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)               V1033270
3328.              69              WRITE (W,190) ((TQ(IVEH,JSUS,I,LSIDE,IJ),LSIDE=1,2),IJ=1,2)          V1033280
3329.              70              WRITE (W,210) (BTQ(IVEH,JSUS,I,LSIDE),LSIDE=1,2)                     V1033290
3330.              71              IF (BTQ(IVEH,JSUS,1,1) .LT. 0. .OR. BTQ(IVEH,JSUS,1,2) .LT. 0.)      V1033300
3331.                1                WRITE (W,230)                                                     V1033310
3332.              72              GO TO 100                                                            V1033320
3333.              73           90 CONTINUE                                                             V1033330
3334.              74              IF (IVEH .EQ. 1) WRITE (W,170) (VEH(IJ,IV),IJ=1,2),                  V1033340
3335.                1             (BRAKE(IJ,JSUS),IJ=1,4), ((AXLE(IJ,IK),IJ=1,3),IK=1,2),               V1033350
3336.                2             ((SIDE(IJ,IK),IJ=1,3),IK=1,2), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)          V1033360
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   MTS          INTERNAL        **** E N T R Y ****
 LINE NO.       STMT NO.        INPUT LISTING

 3337.            75              IF (IVEH .GT. 1) WRITE (W,180) (VEH(IJ,IV),IJ=1,2), ITN,          V1033370
 3338.                           1  (BRAKE(IJ,JSUS),IJ=1,4), ((AXLE(IJ,IK),IJ=1,3),IK=1,2),          V1033380
 3339.                           2  ((SIDE(IJ,IK),IJ=1,3),IK=1,2), ((SIDE(IJ,IK),IJ=1,3),IK=1,2)      V1033390
 3340.            76             WRITE (W,200) (((TQ(IVEH,JSUS,KAX,LSIDE,IJ),LSIDE=1,2),KAX=1,2),V1033400
 3341.                           1  IJ=1,2)                                                           V1033410
 3342.            77             WRITE (W,220) ((BTQ(IVEH,JSUS,KAX,LSIDE),LSIDE=1,2),KAX=1,2)      V1033420
 3343.            78             IF (BTQ(IVEH,JSUS,1,1) .LT. 0. .OR. BTQ(IVEH,JSUS,1,2) .LT. 0.    V1033430
 3344.                           1       .OR. BTQ(IVEH,JSUS,2,1) .LT. 0. .OR. BTQ(IVEH,JSUS,2,2) .  V1033440
 3345.                           2       LT. 0.) WRITE (W,230)                                      V1033450
 3346.            79       100   CONTINUE                                                           V1033460
 3347.                     C                                                                        V1033470
 3348.                     C  UNIT CONVERSION.                                                      V1033480
 3349.                     C                                                                        V1033490
 3350.            80             DO 110 LSIDE = 1, 2                                                V1033500
 3351.            81               DO 110 KAX = 1, 2                                                V1033510
 3352.            82                 IF (BTQ(IVEH,JSUS,KAX,LSIDE) .LT. 0.) GO TO 110                V1033520
 3353.            83                 BTQ(IVEH,JSUS,KAX,LSIDE) = BTQ(IVEH,JSUS,KAX,LSIDE) / 12.     V1033530
 3354.            84       110   CONTINUE                                                           V1033540
 3355.            85       120 CONTINUE                                                             V1033550
 3356.            86           RETURN                                                               V1033560
 3357.                     C                                                                        V1033570
 3358.                     C   FORMATS                                                              V1033580
 3359.                     C                                                                        V1033590
 3360.            87       130 FORMAT (2F10.4)                                                      V1033600
 3361.            88       140 FORMAT (2F10.2)                                                      V1033610
 3362.            89       150 FORMAT ('0', T4, 2A4, 4A4, T90, 3A4, T110, 3A4/T5,                   V1033620
 3363.                          1       '--------------------', T90, '---------', T110,           V1033630
 3364.                          2       '----------'/)                                             V1033640
 3365.            90       160 FORMAT ('0', T4, 2A4, ' NO.', I2, 4A4, T90, 3A4, T110, 3A4/T5,       V1033650
 3366.                          1       '--------------------', T90, '---------', T110,           V1033660
 3367.                          2       '----------'/)                                             V1033670
 3368.            91       170 FORMAT ('0', T4, 2A4, 4A4, T75, 3A8, T105, 3A8/T5,                   V1033680
 3369.                          1       '--------------------', T75, '--------------------', T105, V1033690
 3370.                          2       '--------------------'/T74, 3A4, 3A4, T105, 3A4, 3A4/T74,  V1033700
 3371.                          3       '---------', 3X, '----------', T105, '---------', 3X,      V1033710
 3372.                          4       '----------'/)                                             V1033720
 3373.            92       180 FORMAT ('0', T4, 2A4, ' NO.', I2, 4A4, T75, 3A8, T105, 3A8/T5,       V1033730
 3374.                          1       '--------------------', T75, '--------------------', T105, V1033740
 3375.                          2       '--------------------'/T74, 3A4, 3A4, T105, 3A4, 3A4/T74,  V1033750
 3376.                          3       '---------', 3X, '----------', T105, '---------', 3X,      V1033760
 3377.                          4       '----------'/)                                             V1033770
 3378.            93       190 FORMAT ('0', T10, 'TIME LAG (SEC)', T90, F10.4, T110, F10.4/T10,     V1033780
 3379.                          1       'RISE TIME (SEC)', T90, F10.4, T110, F10.4)                V1033790
 3380.            94       200 FORMAT ('0', T10, 'TIME LAG (SEC)', T74, F10.4, 3X, F10.4, T105,     V1033800
 3381.                          1       F10.4, 3X, F10.4/T10, 'RISE TIME (SEC)', T74, F10.4, 3X,   V1033810
 3382.                          2       F10.4, T105, F10.4, 3X, F10.4)                             V1033820
 3383.            95       210 FORMAT (' ', T10, 'BRAKE TORQUE (IN-LB/PSI/BRAKE)', T90, F10.4,      V1033830
 3384.                          1       T110, F10.4)                                               V1033840
 3385.            96       220 FORMAT (' ', T10, 'BRAKE TORQUE (IN-LB/PSI/BRAKE)', T74, F10.4,      V1033850
 3386.                          1       3X, F10.4, T105, F10.4, 3X, F10.4)                         V1033860
 3387.            97       230 FORMAT (' ', T15, '***  NEGATIVE ENTRY INDICATES TABLE ENTERED ***'V1033870
 3388.                          1'/T15, '***  ECHO WILL APPEAR ON TABLE INDEX PAGE ***')           V1033880
 3389.                     C                                                                        V1033890
 3390.            98           ENTRY BRAKE2(IU,IS,IA,ILR,XXS,X)                                     V1033900
 3391.            99           DIT = X - TEST(IU,IS,IA,ILR)                                         V1033910
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   MTS          INTERNAL       ****  P U N C H Y ****
 LINE NO.       STMT NO.       INPUT LISTING

3392.             100             IF (IBK .EQ. 1) RETURN                                                  V1033920
3393.                       C                                                                             V1033930
3394.                       C  FIND TREADLE PRESSURE.                                                     V1033940
3395.                       C                                                                             V1033950
3396.             101             IJ = NTP(1,2)                                                           V1033960
3397.             102             XXX = X - TQ(IU,IS,IA,ILR,1)                                            V1033970
3398.             103             CALL TABLE(1, IJ, XTP, YTP, XXX, PTRD)                                  V1033980
3399.                       C                                                                             V1033990
3400.                       C  FIND BRAKE PRESSURE.                                                       V1034000
3401.                       C                                                                             V1034010
3402.             104             P(IL,IS,IA,ILR) = (PO(IU,IS,IA,ILR) - PTRD) * EXP(-DTT/TQ(IU,IS,      V1034020
3403.                            1IA,ILR,2)) + PTRD                                                       V1034030
3404.             105             OMEGAL = (1. - SLIP(IU,IS,IA,1)) * UW(IU,IS,IA,1)                       V1034040
3405.             106             OMEGAR = (1. - SLIP(IU,IS,IA,2)) * UW(IU,IS,IA,2)                       V1034050
3406.             107             IF (ILOCK .NE. 1) GO TO 250                                             V1034060
3407.             108             JKL = (IU - 1) * 9 + (IS - 1) * 4 + (IA - 1) * 2 + ILR                  V1034070
3408.             109             IF (IALOPT(JKL) .EQ. 0) GO TO 250                                       V1034080
3409.             110             IF (IOP(JKL) .EQ. 1) GO TO 240                                          V1034090
3410.             111             P2 = P(IU,IS,IA,ILR)                                                    V1034100
3411.             112           240 DUM1 = UW(IU,IS,IA,ILR)                                               V1034110
3412.             113             DUM2 = XDOOM(IL) + XXS(IL,IS,IA) * PBAR(IU,3) ** 2                      V1034120
3413.             114             P1 = PO(IU,IS,IA,ILR)                                                   V1034130
3414.             115             CALL ANTILK(OMEGAL, OMEGAR, DUM1, DUM2, P1, PTRD, P2, JKL, X)           V1034140
3415.             116             P(IL,IS,IA,ILR) = P2                                                    V1034150
3416.                       C                                                                             V1034160
3417.                       C  CHECK FOR LINEAR BRAKE MODEL.                                              V1034170
3418.                       C                                                                             V1034180
3419.             117           250 IF (BTQ(IU,IS,IA,ILR) .GE. 0.) GO TO 2EC                              V1034190
3420.                       C                                                                             V1034200
3421.                       C  TORQUE - PRESSURE  TABLE  LOOK-UP.                                         V1034210
3422.                       C                                                                             V1034220
3423.             118             IJ = NUM(IU,IS,IA,ILR,1)                                                V1034230
3424.             119             IK = NUM(IU,IS,IA,ILR,2)                                                V1034240
3425.             120             PSC = P(IU,IS,IA,ILR)                                                   V1034250
3426.                       C                                                                             V1034260
3427.                       C  LOAD DUMMY ARRAYS.                                                         V1034270
3428.                       C                                                                             V1034280
3429.             121             DO 260 I = IJ, IK                                                       V1034290
3430.             122               DUMX(I - IJ + 1) = XX(IU,I)                                           V1034300
3431.             123           260 DUMY(I - IJ + 1) = YY(IU,I)                                           V1034310
3432.             124             IKK = IK - IJ + 1                                                       V1034320
3433.             125             CALL TABLE(1, IKK, DUMX, DUMY, PSC, Q)                                  V1034330
3434.             126             T(IL,IS,IA,ILR) = Q                                                     V1034340
3435.             127           270 PO(IL,IS,IA,ILR) = P(IU,IS,IA,ILR)                                    V1034350
3436.             128             IF (SLIP(IU,IS,IA,ILR) .GE. 0.9999) T(IL,IS,IA,ILR) = -EXW(IU,IS,       V1034360
3437.                            1IA,ILR) * SRAD(IU,IS,IA,ILR)                                            V1034370
3438.             129             TLST(IL,IS,IA,ILR) = X                                                  V1034380
3439.             130             RETURN                                                                  V1034390
3440.             131           280 T(IL,IS,IA,ILR) = BTQ(IU,IS,IA,ILR) * P(IU,IS,IA,ILR)                 V1034400
3441.             132             GO TO 270                                                               V1034410
3442.             133             END                                                                     V1034420
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES
ANTILK		SUBP	115
BRAKE1		SUBP	10
BRAKE2	(R*4)	ENTRY	98D
EXP	(R*4)	FCN	104
TABDIP		SUBP	48
TABLE		SUBP	103 125
<EXIT>		SUBP	26 86 100 130

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTS	COMMON	REFERENCES
ALEPRM	(R*4)	ARRAY	TIRES	12C
AXLE	P*8	ARRAY		2C 160 22 74 75
BRAKE	(R*4)	ARRAY		17D 18 67 68 74 75
BTQ	(R*4)	ARRAY	BRAKE	11C 43* 44* 46 47 70 71 77 78 82 83* 117 131
CALE	(R*4)	ARRAY	TIRES	12C
CAT	(R*4)	ARRAY	TIRES	12C
CS	(R*4)	ARRAY	TIRES	12C
DBX	(R*4)	ARRAY	CMACC	7C
DBY	(R*4)	ARRAY	CMACC	7C
DTS	(R*4)	ARRAY	TIRES	12C
DTT	(R*4)			99* 104
DUMX	(R*4)	ARRAY		15C 122* 125?
DUMY	(R*4)	ARRAY		15C 123* 125?
DUM1	(R*4)			112* 115?
DUM2	(R*4)			113* 115?
EXT	(R*4)	ARRAY	TIRES	12C
EXW	(R*4)	ARRAY	TIRES	12C 128
EYT	(R*4)	ARRAY	TIRES	12C
EYW	(R*4)	ARRAY	TIRES	12C
HEAD	(R*4)	ARRAY	PAGE	5C
I	(I*4)			121* 122 123
IA	(I*4)			98 99 102 104 105 106 108 111 112 113 114 116 117 118 119 120 126 127 128 129 131
IALOPT	(I*4)	ARRAY	ANTILK	8C 109
IBK	(I*4)		BRAKE	11C 23 24 26 100
II	(I*4)			59* 60
IJ	(I*4)			39* 40 41 67* 68* 69* 74* 75* 76* 101* 103? 118* 121 122 123 124
IK	(I*4)			53* 54 57 58 59 67* 68* 74* 75* 119* 121 124
IKK	(I*4)			58* 59 124* 125?
ILOCK	(I*4)		ANTILK	8C 107
ILR	(I*4)			98 99 102 104 108 111 112 114 116 117 118 119 120 126 127 129 129 131
IOP	(I*4)	ARRAY	ANTILK	8C 110
IS	(I*4)			98 99 102 104 105 106 108 111 112 113 114 116 117 118 119 120 126 127 129 129 131
ITN	(I*4)			62* 68 75
IU	(I*4)			98 99 102 104 105 106 109 111 112 113 114 116 117 118 119 120 122 123 126 127 128 129 131
IV	(I*4)			48? 50 51 63* 64* 65* 67 68 74 75
IVEH	(I*4)			1 23 30 31 32 35 37 40 41 43 44 46

YAXEOR	(R*4)	ARRAY TIRES	12C	
YDOCM	(R*4)	ARRAY CMACC	7C	
YN	(R*4)		48?	49
YT	(R*4)	ARRAY TIRES	12C	
YTD	(R*4)	ARRAY TIRES	12C	
YTP	(R*4)	ARRAY BRAKE	11C	103?
YY	(R*4)	ARRAY BRAKE	11C	63* 123
I			69	70

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES			
10	25	FMT	24			
20	32		29			
30	33		27	28		
40	42		39			
50	53		49			
60	56	FMT	55			
70	60		59			
80	61		38	45	46	52
90	73		66			
100	79		72			
110	84		80	81	82	
120	95		34	35		
130	87	FMT	40			
140	88	FMT	43	60		
150	89	FMT	67			
160	90	FMT	68			
170	91	FMT	74			
180	92	FMT	75			
190	93	FMT	69			
200	94	FMT	76			
210	95	FMT	70			
220	96	FMT	77			
230	97	FMT	71	78		
240	112		110			
250	117		107	109		
260	123		121			
270	127		132			
280	131		117			

TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION

```
 MTS          INTERNAL      **** E N T R Y ****
LINE NO.      STMT NO.      INPUT LISTING

3443.                  C                                                                    V1034430
3444.                  C   *** SUBROUTINE LINE ***                                         V1034440
3445.                  C                                                                    V1034450
3446.            1        SUBROUTINE LINE(I, J, KAX, L, SF, K, C, CF)                      V1034460
3447.            2        REAL K                                                           V1034470
3448.            3        DIMENSION SF(4,2,2,2), K(4,2,2,2), C(4,2,2,2), CF(4,2,2,2)       V1034480
3449.            4        COMMON /BOLT/ P(4,2,2,2), PO(4,2,2,2), TLST(4,2,2,2), T(4,2,2,2), V1034490
3450.                    1       PTRO                                                     V1034500
3451.            5        COMMON /TAND/ FSPLIT(4,2), FSHIFT(4,2), TD(4,2)                  V1034510
3452.            6        COMMON /KEY/ MVEH, KEY(4,2), KDOLLY(4)                           V1034520
3453.            7        COMMON /SPRING/ S(4,2,2,2), SO(4,2,2,2), THETAX(4,2,2),          V1034530
3454.                    1       DTHAX(4,2,2), ZAXLE(4,2,2), DZAXLE(4,2,2), DV(4,2,2,2),  V1034540
3455.                    2       NOSPR(4,2,2,2,2), DEFSPR(320), FORSPR(320), ZO(4,2,2,2), V1034550
3456.                    3       XLOAD(4,2,2,2)                                           V1034560
3457.            8        IF (K(I,J,KAX,L) .LT. 0.) GO TO 10                               V1034570
3458.            9        SF(I,J,KAX,L) = K(I,J,KAX,L) * S(I,J,KAX,L) + C(I,J,KAX,L) * SO(I,V1034580
3459.                   1J,KAX,L)                                                          V1034590
3460.           10        GO TO 20                                                         V1034600
3461.           11     10 DUM = ZO(I,J,KAX,L) - S(I,J,KAX,L)                               V1034610
3462.           12        CALL TABLE(NOSPR(I,J,KAX,L,1), NOSPR(I,J,KAX,L,2), DEFSPR, FORSPR,V1034620
3463.                   1     DUM, FBAR)                                                 V1034630
3464.                  C                                                                    V1034640
3465.                  C   NOTE TABLE IS COMPRESSION , FORCE IS TENSION                   V1034650
3466.                  C                                                                    V1034660
3467.           13        SF(I,J,KAX,L) = XLOAD(I,J,KAX,L) - FBAR + C(I,J,KAX,L) * SO(I,J,  V1034670
3468.                  1KAX,L)                                                            V1034680
3469.           14     20 CONTINUE                                                         V1034690
3470.           15        IF (KEY(I,J) .LE. 0) GO TO 30                                    V1034700
3471.           16        SF(I,J,1,L) = SF(I,J,1,L) - FSHIFT(I,J) * (T(I,J,1,L) + T(I,J,2,L)V1034710
3472.                  1) / TD(I,J)                                                       V1034720
3473.           17        SF(I,J,2,L) = SF(I,J,2,L) + FSHIFT(I,J) * (T(I,J,1,L) + T(I,J,2,L)V1034730
3474.                  1) / TD(I,J)                                                       V1034740
3475.           18     30 CONTINUE                                                         V1034750
3476.           19        IF (SO(I,J,KAX,L) .EQ. 0.) RETURN                                V1034760
3477.           20        IF (ABS(SO(I,J,KAX,L)) .LT. DV(I,J,KAX,L)) GO TO 40              V1034770
3478.           21        SF(I,J,KAX,L) = CF(I,J,KAX,L) * SO(I,J,KAX,L) / ABS(SO(I,J,KAX,L))V1034780
3479.                  1 + SF(I,J,KAX,L)                                                  V1034790
3480.           22        GO TO 50                                                         V1034800
3481.           23     40 SF(I,J,KAX,L) = SF(I,J,KAX,L) + CF(I,J,KAX,L) * SO(I,J,KAX,L) /  V1034810
3482.                  1DV(I,J,KAX,L)                                                     V1034820
3483.           24     50 CONTINUE                                                         V1034830
3484.           25        RETURN                                                           V1034840
3485.           26        END                                                              V1034850
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES	
ABS	(R*4)	FCN	20	21
LINE		SUBR	10	
TABLE		SUBR	12	
<EXIT>		SUBR	19	25

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES											
C	(R*4)	ARRAY		1	30	9	13								
CF	(R*4)	ARRAY		1	30	21	23								
DEFSPR	(R*4)	ARRAY	SPRING	7C	122										
DTHAX	(R*4)	ARRAY	SPRING	7C											
DUM	(R*4)			11*	122										
DV	(R*4)	ARRAY	SPRING	7C	20	23									
DZAXLE	(R*4)	ARRAY	SPRING	7C											
FBAR	(R*4)			122	13										
FORSPR	(R*4)	ARRAY	SPRING	7C	122										
FSHIFT	(R*4)	ARRAY	TAND	5C	16	17									
FSPLIT	(R*4)	ARRAY	TAND	5C											
I	(I*4)			1	8	9	11	12	13	15	16	17	19	20	21
				23											
J	(I*4)			1	8	9	11	12	13	15	16	17	19	20	21
				23											
K	R*4	ARRAY		1	20	30	8	9							
KAX	(I*4)			1	8	9	11	12	13	19	20	21	23		
KDOLLY	(I*4)	ARRAY	KEY	6C											
KEY	(I*4)	ARRAY	KEY	6C	15										
L	(I*4)			1	8	9	11	12	13	16	17	19	20	21	23
MVEH	(I*4)		KEY	6C											
NOSPR	(I*4)	ARRAY	SPRING	7C	122										
P	(R*4)	ARRAY	BOUT	4C											
PIRD	(R*4)		BOUT	4C											
PO	(R*4)	ARRAY	BOUT	4C											
S	(R*4)	ARRAY	SPRING	7C	9	11									
SD	(R*4)	ARRAY	SPRING	7C	9	13	19	203	213	23					
SF	(R*4)	ARRAY		1	30	9*	13*	16*	17*	21*	23*				
T	(R*4)	ARRAY	BOUT	4C	16	17									
TD	(R*4)	ARRAY	TAND	5C	16	17									
THETAX	(R*4)	ARRAY	SPRING	7C											
TLST	(R*4)	ARRAY	BOUT	4C											
XLOAD	(R*4)	ARRAY	SPRING	7C	13										
ZAXLE	(R*4)	ARRAY	SPRING	7C											
ZO	(R*4)	ARRAY	SPRING	7C	11										

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES
10	11		8
20	14		10
30	18		15
40	23		20
50	24		22

```
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```

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```
  MTS          INTERNAL       ****  F T N T I C Y ****
LINE NO.       STMT NO.       INPUT LISTING

3486.                     C                                                                    V1034860
3487.                     C    *** SUBROUTINE TABLE ***                                        V1034870
3488.                     C                                                                    V1034880
3489.            1              SUBROUTINE TABLE(M, N, X, Y, Z, Q)                            V1034890
3490.            2              COMMON /KEY/ MVEH, KEY(4,2), KDOLLY(4)                        V1034900
3491.            3              DIMENSION X(1), Y(1)                                          V1034910
3492.            4              INC = 1                                                       V1034920
3493.            5              JJ = M                                                        V1034930
3494.            6              JK = N                                                        V1034940
3495.            7              GO TO 10                                                      V1034950
3496.            8              ENTRY TABLE2(M,N,X,Y,Z,Q,IVEH)                                V1034960
3497.            9              JJ = (M - 1) * MVEH + IVEH                                    V1034970
3498.           10              JK = (N - 1) * MVEH + IVEH                                    V1034980
3499.           11              INC = MVEH                                                    V1034990
3500.           12           10 DO 20 I = JJ, JK, INC                                         V1035000
3501.           13                 IF (Z .LE. X(I)) GO TO 30                                 V1035010
3502.           14           20 CONTINUE                                                      V1035020
3503.           15              Q = Y(I)                                                      V1035030
3504.           16              RETURN                                                        V1035040
3505.           17           30 IF (I .NE. M .AND. Z .NE. X(I)) GO TO 40                      V1035050
3506.           18              Q = Y(I)                                                      V1035060
3507.           19              IF (I .EQ. M .AND. Z .LT. X(I)) Q = 0.0                       V1035070
3508.           20              RETURN                                                        V1035080
3509.           21           40 Q = (Y(I)*(Z - X(I - INC)) - Y(I - INC)*(Z - X(I))) / (X(I) - X(I V1035090
3510.                         1- INC))                                                       V1035100
3511.           22              RETURN                                                        V1035110
3512.           23              END                                                           V1035120
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES		
TABLE		SUBR	10		
TABLE2	(R*4)	ENTRY	80		
<EXIT>		SUBR	16	20	22

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES						
I	(I*4)			12*	13	15	17	18	19	21
INC	(I*4)			4*	11*	12	21			
IVEH	(I*4)			8	9	10				
JJ	(I*4)			5*	9*	12				
JK	(I*4)			6*	10*	12				
KOOLLY	(I*4)	ARRAY	KEY	2C						
KEY	(I*4)	ARRAY	KEY	2C						
M	(I*4)			1	5	8	9	17	19	
MVEH	(I*4)		KEY	2C	9	10	11			
N	(I*4)			1	6	8	10			
Q	(R*4)			1	8	15*	18*	19*	21*	
X	(R*4)	ARRAY		1	3D	8	13	17	19	21
Y	(R*4)	ARRAY		1	3D	8	15	18	21	
Z	(R*4)			1	8	13	17	19	21	

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES
10	12		7
20	14		12
30	17		13
40	21		17

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```
  MTS          INTERNAL       **** F T N T I D Y ****
LINE NO.       STMT NO.       INPUT LISTING

3513.                     C                                                                    V1035130
3514.                     C   ***   SUBROUTINE TABLXY ***                                     V1035140
3515.                     C                                                                    V1035150
3516.              1            SUBROUTINE TABLXY(M1, N1, M2, N2, X1, Z1, X2, Z2, XY, NDIM, Q)  V1035160
3517.              2            DIMENSION X1(1), X2(1), XY(1)                                V1035170
3518.              3            DO 10 I = M1, N1                                             V1035180
3519.              4              IF (Z1 .LE. X1(I)) GO TO 20                                V1035190
3520.              5           10 CONTINUE                                                   V1035200
3521.              6            I1 = N1                                                      V1035210
3522.              7            GO TO 30                                                     V1035220
3523.              8           20 I1 = I - 1                                                 V1035230
3524.              9            IF (I1 .LE. M1) I1 = M1                                     V1035240
3525.             10           30 DO 40 J = M2, N2                                          V1035250
3526.             11              IF (Z2 .LE. X2(J)) GO TO 50                               V1035260
3527.             12           40 CONTINUE                                                  V1035270
3528.             13              J1 = N2                                                   V1035280
3529.             14              GO TO 60                                                  V1035290
3530.             15           50 J1 = J - 1                                                V1035300
3531.             16              IF (J1 .LE. M2) J1 = M2                                   V1035310
3532.             17           60 U1 = XY(I1 + (J1 - 1)*NDIM)                               V1035320
3533.             18              IF (I1 .EQ. M1 .AND. Z1 .LE. X1(M1) .OR. I1 .EQ. N1)      V1035330
3534.                            1    GO TO 70                                             V1035340
3535.             19              U2 = XY(I1 + 1 + (J1 - 1)*NDIM)                           V1035350
3536.             20              GO TO 80                                                  V1035360
3537.             21           70 U2 = U1                                                   V1035370
3538.             22           80 IF (J1 .EQ. M2 .AND. Z2 .LE. X2(M2) .OR. J1 .EQ. N2)      V1035380
3539.                            1    GO TO 100                                            V1035390
3540.             23              U3 = XY(I1 + J1*NDIM)                                     V1035400
3541.             24              IF (I1 .EQ. M1 .AND. Z1 .LE. X1(M1) .OR. I1 .EQ. N1)      V1035410
3542.                            1    GO TO 90                                             V1035420
3543.             25              U4 = XY(I1 + 1 + J1*NDIM)                                 V1035430
3544.             26              GO TO 110                                                 V1035440
3545.             27           90 U4 = U3                                                   V1035450
3546.             28              GO TO 110                                                 V1035460
3547.             29          100 U3 = U1                                                   V1035470
3548.             30              U4 = U2                                                   V1035480
3549.             31          110 W1 = U1                                                   V1035490
3550.             32              IF (U1 .NE. U2) W1 = U1 + (U2 - U1) / (X1(I1 + 1) - X1(I1)) * (Z1 V1035500
3551.                            1- X1(I1))                                                V1035510
3552.             33              W2 = U3                                                   V1035520
3553.             34              IF (U3 .NE. U4) W2 = U3 + (U4 - U3) / (X1(I1 + 1) - X1(I1)) * (Z1 V1035530
3554.                            1- X1(I1))                                                V1035540
3555.             35              Q = W1                                                    V1035550
3556.             36              IF (W1 .NE. W2) Q = W1 + (W2 - W1) / (X2(J1 + 1) - X2(J1)) * (Z2 -V1035560
3557.                            1 X2(J1))                                                 V1035570
3558.             37              RETURN                                                    V1035580
3559.             38              END                                                       V1035590
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES
TABLXY		SUBR	10
<EXIT>		SUBR	37

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES								
I	(I*4)			3*	4	8						
I1	(I*4)			6*	8*	9*	17	18	19	23	24	25	32	34
J	(I*4)			10*	11	15						
J1	(I*4)			13*	15*	16*	17	19	22	23	25	36		
M1	(I*4)			1	3	9	18	24						
M2	(I*4)			1	10	16	22							
NDIM	(I*4)			1	17	19	23	25						
N1	(I*4)			1	3	6	18	24						
N2	(I*4)			1	10	13	22							
Q	(R*4)			1	35*	36*								
U1	(R*4)			17*	21	29	31	32						
U2	(R*4)			19*	21*	30	32							
U3	(R*4)			23*	27	29*	33	34						
U4	(R*4)			25*	27*	30*	34							
W1	(R*4)			31*	32*	35	36							
W2	(R*4)			33*	34*	36								
XY	(R*4)	ARRAY		1	20	17	19	23	25					
X1	(R*4)	ARRAY		1	20	4	18	24	32	34				
X2	(R*4)	ARRAY		1	20	11	22	36						
Z1	(R*4)			1	4	18	24	32	34					
Z2	(R*4)			1	11	22	36							

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES	
10	5		3	
20	8		4	
30	10		7	
40	12		10	
50	15		11	
60	17		14	
70	21		18	
80	22		20	
90	27		24	
100	29		22	
110	31		26	28

TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION

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MTS LINE NO. | INTERNAL STMT NO. | **** F T N T I D Y **** INPUT LISTING

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3560.                C                                                                      V1035600
3561.                C   *** SUBROUTINE DRIVE1 ***                                         V1035610
3562.                C                                                                      V1035620
3563.          1       SUBROUTINE DRIVE1(ISTEER)                                           V1035630
3564.          2       INTEGER R, W                                                        V1035640
3565.          3       REAL N, NS, KT, IX7                                                 V1035650
3566.          4       COMMON /PAGE/ NPPP, HEAD(20), R, W                                  V1035660
3567.          5       COMMON /SLOPES/ SLOPEY(4,2,2,2)                                     V1035670
3568.          6       COMMON /KEY/ MVEH, KEY(4,2), KDOLLY(4)                              V1035680
3569.          7       COMMON /SPMASS/ WHBS(4), RPL(4), A3(4), APHI(4), DELTA(4), VW(4),   V1035690
3570.                 1        VJ(4,3), PW(4), PX(4), PZ(4), PJ(4,3), SNL(4,2), D(4),     V1035700
3571.                 2        PH(4), TCL(4), MCS                                         V1035710
3572.          8       COMMON /TIRES/ SRAD(4,2,2,2), CALF(4,2,2,2), ETS(4,2,2,2),          V1035720
3573.                 1        KT(4,2,2,2), CS(4,2,2,2), N(4,2,2,2), CAT(4,2,2,2),        V1035730
3574.                 2        YYT(4,2,2,2), YTD(4,2,2,2), TTSUM(4,3), XAXFOR(4,2,2),     V1035740
3575.                 3        YAXFOR(4,2,2), FYI(4,2,2,2), FXI(4,2,2,2), FXW(4,2,2,2),   V1035750
3576.                 4        FYW(4,2,2,2), ALFERM(4,2,2,2), SLIP(4,2,2,2)               V1035760
3577.          9       COMMON /FCTOUT/ XBAR(4,3), PHIBAR(4,3), UBAR(4,3), PBAR(4,3)        V1035770
3578.         10       COMMON /STATIC/ NS(4,2,2), ET(4), SF(4,2,2,2)                       V1035780
3579.         11       DIMENSION Y(5), YC(5)                                               V1035790
3580.         12       DIMENSION TRANSI(4,4), DUMV11(4)                                    V1035800
3581.         13       DIMENSION TRANS(4,4), PHNOW(4,4), FNOW(4,4), FLAST(4,4)             V1035810
3582.         14       DIMENSION XP(100), YP(100), XT(100), YT(100)                        V1035820
3583.         15       DIMENSION F(4,4), G(4), DUMV1(4), VECM(4)                           V1035830
3584.         16       DIMENSION DUMV2(4), DUMM1(4,4), DUMM2(4,4), DUMM3(4,4), DUMM4(4,4)  V1035840
3585.         17       DIMENSION DUMV3(4), DUMV4(4)                                        V1035850
3586.         18       DIMENSION R1(4,4), DUMM5(4,4), DUMM6(4,4), DUMM7(4,4), DUMM8(4,4)   V1035860
3587.         19       DIMENSION TTT(4,4,10), TTT1(4,4,10)                                 V1035870
3588.         20       DIMENSION DMEM(100,2)                                               V1035880
3589.         21       DIMENSION TOR(4,2,2,2), SRS(4,2,2,2), XXS(4,2,2), DT(4,2,2,2),      V1035890
3590.                 1        DERY(112)                                                  V1035900
3591.         22       DATA VECM /1.0, 3*0.0/                                              V1035910
3592.         23       DATA XXS /16*0./                                                    V1035920
3593.         24       DATA SRS /32*0./                                                    V1035930
3594.         25       DATA DERY /112*0./                                                  V1035940
3595.         26       NP = -ISTEER                                                        V1035950
3596.         27       WRITE (W,10)                                                        V1035960
3597.         28    10 FORMAT ('0', T20, 'CLOSED-LOOP PATH FOLLOWING MODE', /, '0', T20,   V1035970
3598.                1        'X-Y ', 'PATH', ' COORDINATES :', /, '0', T90, 'X', T100,   V1035980
3599.                2        'Y', /, '0', T87, '(FEET)', T97, '(FEET)')                  V1035990
3600.         29    20 FORMAT (I3)                                                        V1036000
3601.         30       DO 30 J = 1, NP                                                     V1036010
3602.         31         READ (R,40) XP(J), YP(J)                                          V1036020
3603.         32    30 WRITE (W,50) XP(J), YP(J)                                          V1036030
3604.         33       READ (R,120) TAUMEM, TEF                                            V1036040
3605.         34       TICYCL = 0.01                                                       V1036050
3606.         35       TSS = 0.0                                                           V1036060
3607.         36    40 FORMAT (2F10.2)                                                    V1036070
3608.         37    50 FORMAT (' ', T83, 2F10.2)                                          V1036080
3609.         38       WRITE (W,60) TAUMEM, TEF                                            V1036090
3610.         39    60 FORMAT (' ', /, ' ', T20, 'DRIVER TRANSPORT LAG (SEC) :', T60,     V1036100
3611.                1        F4.2, /, ' ', T20, 'END OF PREVIEW INTERVAL (SEC) :', T60,  V1036110
3612.                2        F4.2/)                                                     V1036120
3613.         40       RETURN                                                              V1036130
3614.         41       ENTRY DRIVE2                                                        V1036140
```

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   MTS          INTERNAL       ****  F T N T I D Y ****
 LINE NO.       STMT NO.       INPUT LISTING

3615.              42           WF = NS(1,1,1)                                                                  V1036150
3616.              43           WR = NS(1,2,1)                                                                  V1036160
3617.              44           CALL TIRE(1, 1, 1, 1, 2, T, DT, SRS, XXS, DERY, TALIGN, 0.)                     V1036170
3618.              45           CAF = SLOPEY(1,1,1,1) * NS(1,1,1) / 2.                                          V1036180
3619.              46           CALL TIRE(1, 2, 1, 1, 2, T, DT, SRS, XXS, DERY, TALIGN, 0.)                     V1036190
3620.              47           CAR = SLOPEY(1,2,1,1) * NS(1,2,1) / 2.                                          V1036200
3621.              48           IF (KEY(1,2) .LE. 0) GO TO 70                                                   V1036210
3622.              49           CALL TIRE(1, 2, 2, 1, 2, T, DT, SRS, XXS, DERY, TALIGN, 0.)                     V1036220
3623.              50           CAR = CAR + SLOPEY(1,2,2,1) * NS(1,2,2) / 2.                                    V1036230
3624.              51           WR = WR + NS(1,2,2)                                                             V1036240
3625.              52        70 RM = (WF + WR) / 32.1666                                                        V1036250
3626.              53           U = UBAR(1,1)                                                                   V1036260
3627.              54           B = WHBS(1) * WF / (WF + WR)                                                    V1036270
3628.              55           A = WHBS(1) - B                                                                 V1036280
3629.              56           RI = A * B * RM                                                                 V1036290
3630.              57           ULAST = U                                                                       V1036300
3631.              58           DMAX = 0.20                                                                     V1036310
3632.              59           KMAX = 70                                                                       V1036320
3633.              60           NTF = 10                                                                        V1036330
3634.              61           NDIM = 5                                                                        V1036340
3635.              62           PSIC = 0.                                                                       V1036350
3636.              63           IRETRN = 0                                                                      V1036360
3637.              64           ICALL = 0                                                                       V1036370
3638.              65           RETURN                                                                          V1036380
3639.              66           ENTRY DRIVER(X,Y,DFW)                                                           V1036390
3640.              67           U = UBAR(1,1)                                                                   V1036400
3641.              68           IF (IRETRN .EQ. 0) GO TO 80                                                     V1036410
3642.              69           IF (X .GT. TLAST) GO TO 130                                                     V1036420
3643.              70           TLAST = X                                                                       V1036430
3644.              71           RETURN                                                                          V1036440
3645.              72        80 DO 90 J = 1, NP                                                                 V1036450
3646.              73             IRETRN = 1                                                                   V1036460
3647.              74             XT(J) = XP(J) * COS(PSIC) + YP(J) * SIN(PSIC)                                V1036470
3648.              75        90 YT(J) = -XP(J) * SIN(PSIC) + YP(J) * COS(PSIC)                                 V1036480
3649.              76       100 FORMAT (4F10.4)                                                               V1036490
3650.              77           TLAST = 0.                                                                      V1036500
3651.              78           SUM = 0.                                                                        V1036510
3652.              79           DFWLST = 0.                                                                     V1036520
3653.              80           TLAST = 0.                                                                      V1036530
3654.              81           TILAST = 0.                                                                     V1036540
3655.              82           DFW = 0.                                                                        V1036550
3656.              83           DO 110 I = 1, ICC                                                               V1036560
3657.              84             DMEM(I,1) = 0.                                                                V1036570
3658.              85       110 DMEM(I,2) = -1.                                                               V1036580
3659.              86       120 FORMAT (F10.4)                                                                V1036590
3660.              87           RETURN                                                                          V1036600
3661.              88       130 IF (ICALL .NE. 0) GO TO 230                                                   V1036610
3662.              89           ICALL = 1                                                                       V1036620
3663.              90       140 DO 150 I = 1, 4                                                               V1036630
3664.              91             DO 150 J = 1, 4                                                             V1036640
3665.              92               RI(I,J) = 0.                                                              V1036650
3666.              93       150 F(I,J) = 0.                                                                   V1036660
3667.              94           A1 = -2 * (CAF + CAR) / RM / U                                                  V1036670
3668.              95           B1 = 2 * (CAR*B - CAF*A) / RM / U - U                                           V1036680
3669.              96           A2 = 2 * (CAR*B - CAF*A) / RI / U                                               V1036690
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MTS LINE NO.	INTERNAL STMT NO.	**** E N T I D Y **** INPUT LISTING	
3670.	97	B2 = -2 * (CAR*B*B + CAF*A*A) / RI / L	V1036700
3671.	98	C1 = 2 * CAF / RM	V1036710
3672.	99	C2 = 2. * CAF / RI * A	V1036720
3673.	100	F(1,2) = 1.	V1036730
3674.	101	F(1,4) = U	V1036740
3675.	102	F(2,2) = A1	V1036750
3676.	103	F(2,3) = B1	V1036760
3677.	104	F(3,2) = A2	V1036770
3678.	105	F(3,3) = B2	V1036780
3679.	106	F(4,3) = 1.	V1036790
3680.	107	R1(1,1) = 1.	V1036800
3681.	108	R1(2,2) = 1.	V1036810
3682.	109	R1(3,3) = 1.	V1036820
3683.	110	R1(4,4) = 1.	V1036830
3684.	111	G(1) = 0.	V1036840
3685.	112	G(2) = C1	V1036850
3686.	113	G(3) = C2	V1036860
3687.	114	G(4) = 0.	V1036870
3688.	115	ULAST = U	V1036880
3689.	116	DO 220 I = 1, NTF	V1036890
3690.	117	CALL SMPY(P1, 1., TRANS, 4, 4, 0)	V1036900
3691.	118	TJI = (TFF - TSS) / NTF * I + TSS	V1036910
3692.	119	CALL SMPY(R1, 1., FLAST, 4, 4, 0)	V1036920
3693.	120	L = 0	V1036930
3694.	121	TJLAST = 1.	V1036940
3695.	122	160 L = L + 1	V1036950
3696.	123	CALL GMPRD(FLAST, F, FNOW, 4, 4, 4)	V1036960
3697.	124	SCAL = 1. / L	V1036970
3698.	125	CALL SMPY(FNOW, SCAL, FNOW, 4, 4, 0)	V1036980
3699.	126	IF (KMAX .LT. L) GO TO 170	V1036990
3700.	127	TJNOW = TJLAST * TJI	V1037000
3701.	128	CALL SMPY(FNOW, TJNOW, PHNOW, 4, 4, 0)	V1037010
3702.	129	CALL GMADD(TRANS, PHNOW, TRANS, 4, 4)	V1037020
3703.	130	TJLAST = TJNOW	V1037030
3704.	131	CALL SMPY(FNOW, 1., FLAST, 4, 4, 0)	V1037040
3705.	132	GO TO 160	V1037050
3706.	133	170 CONTINUE	V1037060
3707.	134	DO 180 J = 1, 4	V1037070
3708.	135	DO 180 K = 1, 4	V1037080
3709.	136	180 TTT(J,K,I) = TRANS(J,K)	V1037090
3710.	137	CALL SMPY(R1, 1., TRANS1, 4, 4, 0)	V1037100
3711.	138	CALL SMPY(R1, 1., FLAST, 4, 4, 0)	V1037110
3712.	139	L = 0	V1037120
3713.	140	TJLAST = 1.	V1037130
3714.	141	190 L = L + 1	V1037140
3715.	142	CALL GMPRD(FLAST, F, FNOW, 4, 4, 4)	V1037150
3716.	143	SCAL = 1. / (L + 1)	V1037160
3717.	144	CALL SMPY(FNOW, SCAL, FNOW, 4, 4, 0)	V1037170
3718.	145	IF (KMAX .LT. L) GO TO 200	V1037180
3719.	146	TJNOW = TJLAST * TJI	V1037190
3720.	147	CALL SMPY(FNOW, TJNOW, PHNOW, 4, 4, 0)	V1037200
3721.	148	CALL GMADD(TRANS1, PHNOW, TRANS1, 4, 4)	V1037210
3722.	149	TJLAST = TJNOW	V1037220
3723.	150	CALL SMPY(FNOW, 1., FLAST, 4, 4, 0)	V1037230
3724.	151	GO TO 190	V1037240

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   MTS          INTERNAL        **** F T N T I D Y ****
 LINE NO.       STMT NO.        INPUT LISTING

3725.             152       200   CONTINUE                                                    V1037250
3726.             153             DO 210 J = 1, 4                                           V1037260
3727.             154               DO 210 K = 1, 4                                         V1037270
3728.             155       210   TTT1(J,K,I) = TRANSI(J,K)                                 V1037280
3729.             156       220 CONTINUE                                                    V1037290
3730.             157       230 CONTINUE                                                    V1037300
3731.             158           IF (ABS(U - ULAST) .GE. 10.) GO TO 140                      V1037310
3732.             159           T = X                                                       V1037320
3733.             160           SUM = SUM + EPSY * EPSY * (X - TLAST)                       V1037330
3734.             161           TLAST = X                                                   V1037340
3735.             162           EPSI = ABS(Y(4) - PSI0)                                     V1037350
3736.             163           DO 240 I = 1, 5                                             V1037360
3737.             164       240 YC(I) = Y(I)                                                V1037370
3738.             165           IF (EPSI .LE. .10) GO TO 260                                V1037380
3739.             166           PSIC = Y(4)                                                 V1037390
3740.             167           DO 250 J = 1, NP                                            V1037400
3741.             168             XT(J) = XP(J) * COS(PSI0) + YP(J) * SIN(PSIC)             V1037410
3742.             169       250 YT(J) = -XP(J) * SIN(PSIC) + YP(J) * COS(PSI0)              V1037420
3743.             170       260 Y0 = -Y(5) * SIN(PSI0) + Y(1) * COS(PSIC)                   V1037430
3744.             171           X0 = Y(5) * COS(PSI0) + Y(1) * SIN(PSIC)                    V1037440
3745.             172           YC(1) = Y0                                                  V1037450
3746.             173           YC(4) = Y(4) - PSI0                                         V1037460
3747.             174           EPSY2 = 0.                                                  V1037470
3748.             175           TSUM = 0.                                                   V1037480
3749.             176           SSUM = 0.                                                   V1037490
3750.             177           CALL SMPY(DUMV3, 0., DUMV3, 1, 4, 0)                        V1037500
3751.             178           IF (T - TILAST .LE. TICYCL) RETURN                          V1037510
3752.             179           DO 280 I = 1, NTE                                           V1037520
3753.             180             TJI = (TEE - TSS) / NTE * I + TSS                         V1037530
3754.             181             DO 270 J = 1, 4                                           V1037540
3755.             182               DO 270 K = 1, 4                                         V1037550
3756.             183                 DUMM1(J,K) = TTT1(J,K,I)                              V1037560
3757.             184       270     DUMM2(J,K) = TTT(J,K,I)                                 V1037570
3758.             185             CALL GMPRD(VECM, DUMM1, DUMV11, 1, 4, 4)                  V1037580
3759.             186             CALL GMPRD(VECM, DUMM2, DUMV1, 1, 4, 4)                   V1037590
3760.             187             CALL GMPRD(DUMV1, YC, T1, 1, 4, 1)                        V1037600
3761.             188             XCAR = X0 + L * TJI                                       V1037610
3762.             189             CALL TRAJ(XCAR, XT, YT, YPATH, 0)                         V1037620
3763.             190             CALL GMPRD(DUMV11, G, S1, 1, 4, 1)                        V1037630
3764.             191             S1 = S1 * TJI                                             V1037640
3765.             192             EP = T1 + S1 * DEW - YPATH                                V1037650
3766.             193             TSUM = TSUM + (T1 - YPATH) * S1                           V1037660
3767.             194             SSUM = SSUM + S1 * S1                                     V1037670
3768.             195             EPSY2 = EPSY2 + EP * EP * (TEE - TSS) / NTE               V1037680
3769.             196       280 CONTINUE                                                    V1037690
3770.             197           EPSY = SQRT(EPSY2) / (TEE - TSS)                            V1037700
3771.             198           DEW = -TSUM / SSUM                                          V1037710
3772.             199           IF (ABS(DEW) .GT. DMAX) DEW = DMAX * SIGN(1.,DEW)           V1037720
3773.             200           DO 290 J = 1, 2                                             V1037730
3774.             201             DO 290 I = 1, 99                                          V1037740
3775.             202       290 DMEM(100 - I,J) = DMEM(100 - I,J)                           V1037750
3776.             203           DMEM(1,1) = DEW                                             V1037760
3777.             204           DMEM(1,2) = T                                               V1037770
3778.             205           TTAB = T - TAUMEM                                           V1037780
3779.             206           DO 300 I = 1, 99                                            V1037790
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   MTS          INTERNAL       **** P R I N T E D Y ****
LINE NO.        STMT NO.       INPUT LISTING

3780.             207            IF (DMEM(I + 1,2) .LE. TTAB .AND. DMEM(I,2) .GE. TTAB)      VL037800
3781.                         1     GO TO 320                                                  VL037810
3782.             208        300 CONTINUE                                                      VL037820
3783.             209            WRITE (W,310)                                                 VL037830
3784.             210        310 FORMAT ('0', '***** TAUMEM PROBABLY TOO LARGE *****')        VL037840
3785.             211            CALL EXIT                                                     VL037850
3786.             212        320 DEW = DMEM(I,1)                                               VL037860
3787.             213            TLAST = X                                                     VL037870
3788.             214            TILAST = X                                                    VL037880
3789.             215            RETURN                                                        VL037890
3790.             216            END                                                           VL037900
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES										
ABS	(R*4)	FCN	158	162	195								
COS	R*4	FCN	74	75	168	169	170	171					
DRIVER	(R*4)	ENTRY	6E0										
DRIVE1		SUBR	10										
DRIVE2	(R*4)	ENTRY	410										
EXIT		SUBR	211										
GMADD		SUBR	129	148									
GMPRD		SUBR	123	142	185	186	187	190					
SIGN	(R*4)	FCN	195										
SIN	(R*4)	FCN	74	75	168	169	170	171					
SMPY		SUBR	117	119	125	128	131	137	138	144	147	150	177
SQRT	(R*4)	FCN	197										
TIRE		SUBR	44	46	49								
TRAJ		SUBR	189										
<EXIT>		SUBR	40	65	71	87	178	215					

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES							
A	(R*4)			55*	56	95	96	97	99		
ALPRM	(R*4)	ARRAY	TIRES	8C							
APHI	(R*4)	ARRAY	SPMASS	7C							
A1	(R*4)			94*	102						
A2	(R*4)			96*	104						
A3	(R*4)	ARRAY	SPMASS	7C							
B	(R*4)			54*	55	56	95	96	97		
BB1	(R*4)	ARRAY	SPMASS	7C							
B1	(R*4)			95*	103						
B2	(R*4)			97*	105						
CAE	(R*4)			45*	94	95	96	97	98	99	
CALE	(R*4)	ARRAY	TIRES	8C							
CAR	(R*4)			47*	50*	94	95	96	97		
CAT	(R*4)	ARRAY	TIRES	8C							
CS	(R*4)	ARRAY	TIRES	8C							
C1	(R*4)			98*	112						
C2	(R*4)			99*	113						
D	(R*4)	ARRAY	SPMASS	7C							
DELTA	(R*4)	ARRAY	SPMASS	7C							
DEPY	(R*4)	ARRAY		21C	25	447	467	497			
DFW	(R*4)			66	82*	192	198*	199*	203	212*	
DFWLST	(R*4)			79*							
DMAX	(R*4)			58*	199						
DMEM	(R*4)	ARRAY		20D	84*	95*	202*	203*	204*	207	212
DT	(R*4)	ARRAY		21D	447	467	497				
DTS	(R*4)	ARRAY	TIRES	9C							
DUMM1	(R*4)	ARRAY		16D	183*	185?					
DUMM2	(R*4)	ARRAY		16D	184*	186?					
DUMM3	(R*4)	ARRAY		16D							
DUMM4	(R*4)	ARRAY		16D							
DUMM5	(R*4)	ARRAY		19D							
DUMM6	(R*4)	ARRAY		19C							
DUMM7	(R*4)	ARRAY		19D							
DUMM8	(R*4)	ARRAY		19D							

DUMV1	(R*4)	ARRAY		15C	186?	187?							
DUMV11	(R*4)	ARRAY		12D	185?	193?							
DUMV2	(R*4)	ARRAY		16D									
DUMV3	(R*4)	ARRAY		17D	177?								
DUMV4	(R*4)	ARRAY		17D									
EP	(R*4)			192*	195								
EPST	(R*4)			162*	165								
EPSY	(R*4)			160	197*								
EPSY2	(R*4)			174*	195*	197?							
F	(R*4)	ARRAY		15D	93*	100*	101*	102*	103*	104*	105*	106*	123?	142?
FLAST	(R*4)	ARRAY		13D	119?	123?	131?	138?	142?	150?				
FNOW	(R*4)	ARRAY		13C	123?	125?	128?	131?	142?	144?	147?	150?		
FT	(R*4)	ARRAY	STATIC	10C										
FXI	(R*4)	ARRAY	TIRES	8C										
FXW	(R*4)	ARRAY	TIRES	8C										
FYI	(R*4)	ARRAY	TIRES	8C										
FYW	(R*4)	ARRAY	TIRES	8C										
G	(R*4)	ARRAY		15D	111*	112*	113*	114*	190?					
HEAD	(R*4)	ARRAY	PAGE	4C										
I	(I*4)			83*	84	85	90*	92	93	116*	118	136	155	163*	164
				179*	180	183	184	201*	202	206*	207	212			
ICALL	(I*4)			64*	88	89*									
IRETRN	(I*4)			63*	68	73*									
ISTEEP	(I*4)			1	26										
IX7	R*4			3D											
J	(I*4)			30*	31	32	72*	74	75	91*	92	93	134*	136	153*
				155	167*	168	169	181*	183	184	200*	202			
K	(I*4)			135*	136	154*	155	182*	183	184					
KOOLLY	(I*4)	ARRAY	KEY	6C											
KEY	(I*4)	ARRAY	KEY	6C	48										
KMAX	(I*4)			59*	126	145									
KT	R*4	ARRAY	TIRES	3D	8C										
L	(I*4)			120*	122*	124	126	139*	141*	143	145				
MCS	(I*4)		SPMASS	7C											
MVEH	(I*4)		KEY	6C											
N	R*4	ARRAY	TIRES	3D	8C										
NDTM	(I*4)			61*											
NP	(I*4)			26*	30	72	167								
NPPP	(I*4)		PAGE	4C											
NS	R*4	ARRAY	STATIC	3D	10C	42	43	45	47	50	51				
NTF	(I*4)			60*	116	118	179	180	195						
PBAR	(R*4)	ARRAY	ECTOUT	9C											
PH	(R*4)	ARRAY	SPMASS	7C											
PHIBAR	(R*4)	ARRAY	ECTOUT	9C											
PHNOW	(R*4)	ARRAY		13D	128?	129?	147?	148?							
PJ	(R*4)	ARRAY	SPMASS	7C											
PSID	(R*4)			62*	74?	75?	162	166*	168?	169?	170?	171?	173		
PW	(R*4)	ARRAY	SPMASS	7C											
PX	(R*4)	ARRAY	SPMASS	7C											
PZ	(R*4)	ARRAY	SPMASS	7C											
R	I*4		PAGE	2D	4C	31R	33P								
RI	(R*4)			56*	96	97	99								
RM	(R*4)			52*	56	94	95	98							
RI	(R*4)	ARRAY		18D	92*	107*	108*	109*	110*	117?	119?	137?	138?		
SCAL	(R*4)			124*	125?	143*	144?								
SF	(R*4)	ARRAY	STATIC	10C											
SLIP	(R*4)	ARRAY	TIRES	8C											
SLOPEY	(R*4)	ARRAY	SLOPES	5C	45	47	50								

SNI	(R*4)	ARRAY	SPMASS	7C										
SRAD	(R*4)	ARRAY	TIRES	8C										
SRS	(R*4)	ARRAY		21D	24	44?	46?	49?						
SSUM	(R*4)			176*	194*	198								
SUM	(R*4)			78*	160*									
S1	(R*4)			190?	191*	192	193	194						
T	(R*4)			44?	46?	49?	159*	178	204	205				
TALIGN	(R*4)			44?	46?	49?								
TAUMEM	(R*4)			33*	38	205								
TEE	(R*4)			33	38	118	180	195	197					
TICYCL	(R*4)			34*	178									
TILAST	(R*4)			81*	178	214*								
TJI	(R*4)			118*	127	146	180*	188	191					
TJLAST	(R*4)			121*	127	130*	140*	146	149*					
TJNOW	(R*4)			127*	128?	130	146*	147?	149					
TLAST	(R*4)			69	70*	77*	80*	160	161*	213*				
TOI	(R*4)	ARRAY	SPMASS	7C										
TOR	(R*4)	ARRAY		21D										
TRANS	(R*4)	ARRAY		13C	117?	129?	136							
TRANSI	(R*4)	ARRAY		12D	137?	148?	155							
TSS	(R*4)			35*	118	18C	195	197						
TSUM	(R*4)			175*	193*	198								
TTAB	(R*4)			205*	207									
TTSUM	(R*4)	ARRAY	TIRES	8C										
TTT	(R*4)	ARRAY		19C	136*	194								
TTTL	(R*4)	ARRAY		19D	155*	183								
T1	(R*4)			187?	192	193								
U	(R*4)			53*	57	67*	94	95	96	97	101	115	158	188	189?
UBAR	(R*4)	ARRAY	ECTOUT	9C	53	67								
ULAST	(R*4)			57*	115*	158								
VECM	(R*4)	ARRAY		15D	22	185?	186?							
VJ	(R*4)	ARRAY	SPMASS	7C										
VW	(R*4)	ARRAY	SPMASS	7C										
W	1*4		PAGE	2D	4C	27W	32W	38W	209W					
WF	(R*4)			42*	52	54								
WHBS	(R*4)	ARRAY	SPMASS	7C	54	55								
WR	(R*4)			43*	51*	52	54							
X	(R*4)			66	69	7C	159	160	161	213	214			
XAXFOR	(R*4)	ARRAY	TIRES	8C										
XBAR	(R*4)	ARRAY	ECTOUT	9C										
XCAR	(R*4)			189*	189?									
XP	(R*4)	ARRAY		14C	31*	32	74	75	168	169				
XT	(R*4)	ARRAY		14D	74*	168*	189?							
XXS	(R*4)	ARRAY		21D	23	44?	46?	49?						
XO	(R*4)			171*	188									
Y	(R*4)	ARRAY		11D	66	162	164	166	170	171	173			
YAXFOR	(R*4)	ARRAY	TIRES	8C										
YC	(R*4)	ARRAY		11D	164*	172*	173*	187?						
YP	(R*4)	ARRAY		14D	31*	32	74	75	168	169				
YPATH	(R*4)			189?	192	193								
YT	(R*4)	ARRAY		14C	75*	169*	189?							
YTD	(R*4)	ARRAY	TIRES	8C										
YYT	(R*4)	ARRAY	TIRES	9C										
YO	(R*4)			17D*	172									

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES

```
  MTS          INTERNAL       **** F T N T I D Y ****
LINE NO.       STMT NO.       INPUT LISTING

3791.                     C                                                        V1037910
3792.                     C   *** SUBROUTINE TRAJ ***                              V1037920
3793.                     C                                                        V1037930
3794.           1             SUBROUTINE TRAJ(X, XT, YT, YPATH, U)                 V1037940
3795.           2             INTEGER R, W                                         V1037950
3796.           3             COMMON /PAGE/ NAPP, HEAD(20), R, W                   V1037960
3797.           4             DIMENSION XT(1), YT(1)                               V1037970
3798.                     C   SEARCH FOR XI,XI+1:                                  V1037980
3799.           5             DO 10 J = 1, 99                                      V1037990
3800.           6               IF (X .GE. XT(J) .AND. X .LT. XT(J + 1)) GO TO 30  V1038000
3801.           7           10 CONTINUE                                            V1038010
3802.           8             WRITE (6,20)                                         V1038020
3803.           9           20 FORMAT ('0', 'X-SEARCH IN SUB. TRAJ FAILED.')       V1038030
3804.          10             CALL EXIT                                            V1038040
3805.          11           30 SLOPE = (YT(J + 1) - YT(J)) / (XT(J + 1) - XT(J))   V1038050
3806.          12             Y2 = YT(J) + SLOPE * (X - XT(J))                     V1038060
3807.          13             YPATH = Y2                                           V1038070
3808.          14             RETURN                                               V1038080
3809.          15             END                                                  V1038090
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES
EXIT		SUBR	10
TRAJ		SUBR	10
<EXIT>		SUBR	14

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES
HEAD	(R*4)	ARRAY	PAGE	30
J	(I*4)			5* 6 11 12
NNPP	(I*4)		PAGE	30
R	I*4		PAGE	20 30
SLOPE	(R*4)			11* 12
U	(?*4)			1
W	I*4		PAGE	20 30 8W
X	(R*4)			1 6 12
XT	(R*4)	ARRAY		1 40 8 11 12
YPATH	(R*4)			1 13*
YT	(R*4)	ARRAY		1 40 11 12
Y2	(R*4)			12* 13

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES
10	7		5
20	9	FMT	9
30	11		6

TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION

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 MTS                INTERNAL        **** F I N T I O Y ****
LINE NO.            STMT NO.        INPUT LISTING

3810.                       C                                                                                V1038100
3811.                       C    *** SUBROUTINE TABIN ***                                                    V1038110
3812.                       C                                                                                V1038120
3813.                    1            SUBROUTINE TABIN                                                       V1038130
3814.                    2            INTEGER R, W                                                           V1038140
3815.                    3            COMMON /PAGE/ NP, HEAD(20), R, W                                       V1038150
3816.                    4            COMMON /SPRING/ S(4,2,2,2), SD(4,2,2,2), THETAX(4,2,2),                V1038160
3817.                                1        DTHAX(4,2,2), ZAXLE(4,2,2), DZAXLE(4,2,2), DV(4,2,2,2),        V1038170
3818.                                2        NOSPR(4,2,2,2,2,2), DEESPR(320), FORSPR(320), ZO(4,2,2,2),     V1038180
3819.                                3        XLOAD(4,2,2,2)                                                 V1038190
3820.                    5            COMMON /BRAKE/ BIO(4,2,2,2), TO(4,2,2,2,2), NLM(4,2,2,2,2),            V1038200
3821.                                1        XX(4,320), YY(4,320), NTP(1,2), XTP(10), YTP(10), IBK          V1038210
3822.                    6            COMMON /TIRTAB/ UXY(4,3,2,2,10,6,3), VIBRK(4,3,2,2,6,3,10),            V1038220
3823.                                1        VBRK(4,3,2,2,6), EZBRK(4,3,2,2,6), X1ROLX(10,4,3,2,2),         V1038230
3824.                                2        X1ROLY(10,4,3,2,2), X2ROLX(10,4,3,2,2), X2ROLY(10,4,3,2,2),V1038240
3825.                                3        XYROLX(10,10,4,3,2,2), XYROLY(10,10,4,3,2,2),                  V1038250
3826.                                4        NMAXV1(4,3,2,2,6,3), NTABXY(4,3,2,2,2,2), N1ROLX(4,3,2,2),     V1038260
3827.                                5        N1ROLY(4,3,2,2), N2ROLX(4,3,2,2), N2ROLY(4,3,2,2)              V1038270
3828.                    7            DIMENSION II(4), ITOT(4,10)                                            V1038280
3829.                       C                                                                                V1038290
3830.                       C    TABLE DIRECTORY INITIALIZATION                                              V1038300
3831.                       C                                                                                V1038310
3832.                    8            DIMENSION ITABIR(200,6)                                                V1038320
3833.                       C                                                                                V1038330
3834.                       C    ITABIR(I,1) = TABLE NO., (I,2) = UNIT, (I,3) = SUSPENSION,                  V1038340
3835.                       C        (I,4) = AXLE, (I,5) = SIDE, (I,6) INDICATES TABLE TYPE:                 V1038350
3836.                       C          IF (I,6) = 1, THEN IT IS A SPRING TABLE, = 2, MU-Y VS ALPHA           V1038360
3837.                       C          = 3, MU-X VS. SLIP, =4, PRESSURE VS. TORQUE.                          V1038370
3838.                       C        ITCNT = NO. OF TABLES IN DIRECTORY + 1                                  V1038380
3839.                       C                                                                                V1038390
3840.                    9            DO 10 I = 1, 200                                                       V1038400
3841.                   10              DO 10 J = 1, 6                                                       V1038410
3842.                   11          10 ITABIR(I,J) = 0.                                                      V1038420
3843.                   12              ITCNT = 1                                                            V1038430
3844.                   13              RETURN                                                               V1038440
3845.                   14              ENTRY TABDIR(TN,IVEH,JSUS,KAX,LSIDE,IV,JS,KA,LS,YN,ITYPE)            V1038450
3846.                       C                                                                                V1038460
3847.                       C    THIS ROUTINE CHECKS ALL TABLES AND SETS UP A DIRECTORY OF TABLE              V1038470
3848.                       C       INDICES.  VALUES PASSED TO THE ROUTINE ARE TN = TABLE NO.,               V1038480
3849.                       C       IVEH = CURRENT UNIT, JSUS = CURRENT SUSPENSION, KAX = CURRENT            V1038490
3850.                       C       AXLE, LSIDE = CURRENT SIDE.  IF TABLE IS PREVIOUSLY REFERENCED,          V1038500
3851.                       C       RETURNED VALUES ARE THE PREVIOUS UNIT (IV), SUSPENSION (JS),             V1038510
3852.                       C       AXLE (KA), AND SIDE (LS).  IF NOT PREVIOUSLY REFERENCED, RETURNED        V1038520
3853.                       C       VALUES ASSUME CURRENT VALUES.  YN IS RETURN CODE, YN = 0.                V1038530
3854.                       C       INDICATES THAT THE TABLE WAS NOT PREVIOUSLY REFERENCED, YN = 1.          V1038540
3855.                       C       INDICATES THAT THE TABLE WAS FOUND IN THE DIRECTORY.                     V1038550
3856.                       C       ITYPE IS CODE FOR THE TYPE OF TABLE:  1 = NON-LINEAR SPRING,             V1038560
3857.                       C       2 = MU V ALPHA, 3=MU V SLIP, 4 = PRESSURE V TORQUE                       V1038570
3858.                       C                                                                                V1038580
3859.                       C    SEARCH EXISTING TABLE NO.'S                                                 V1038590
3860.                       C                                                                                V1038600
3861.                   15              IXY = 1                                                              V1038610
3862.                   16              IF (ITYPE .EQ. 2) IXY = 2                                            V1038620
3863.                   17              DO 20 I = 1, ITCNT                                                   V1038630
3864.                   18                IF (ITABIR(I,1) .EQ. TN) GO TO 30                                  V1038640
```

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   MTS          INTERNAL        **** F T N T I D Y ****
LINE NO.        STMT NO.        INPUT LISTING

3865.             19        20 CONTINUE                                                    V1038650
3866.                       C                                                             V1038660
3867.                       C   TABLE IS NOT CURRENTLY IN DIRECTORY.  ADD INDICES, INCREMENT TABLE  V1038670
3868.                       C      COUNT.  SET RETURN CODE TO 0.                          V1038680
3869.                       C                                                             V1038690
3870.             20            ITADIR(ITCNT,1) = IA                                      V1038700
3871.             21            ITADIR(ITCNT,2) = IVEH                                    V1038710
3872.             22            ITADIR(ITCNT,3) = JSUS                                    V1038720
3873.             23            ITADIR(ITCNT,4) = KAX                                     V1038730
3874.             24            ITADIR(ITCNT,5) = LSIDE                                   V1038740
3875.             25            ITADIR(ITCNT,6) = ITYPE                                   V1038750
3876.                       C                                                             V1038760
3877.                       C   SET RETURN VALUES                                         V1038770
3878.                       C                                                             V1038780
3879.             26            IV = IVEH                                                 V1038790
3880.             27            JS = JSUS                                                 V1038800
3881.             28            KA = KAX                                                  V1038810
3882.             29            LS = LSIDE                                                V1038820
3883.             30            YN = 0.                                                   V1038830
3884.             31            ITCNT = ITCNT + 1                                         V1038840
3885.             32            IF (ITYPE .EQ. 2 .OR. ITYPE .EQ. 3) CALL TIRFL(IV, JS, KA, LS,  V1038850
3886.                          1     IXY)                                                 V1038860
3887.                       C                                                             V1038870
3888.             33            RETURN                                                    V1038880
3889.                       C                                                             V1038890
3890.                       C   FOR A PREVIOUSLY REFERENCED TABLE                        V1038900
3891.                       C                                                             V1038910
3892.             34        30 CONTINUE                                                   V1038920
3893.             35           IF (ITYPE .NE. ITADIR(I,6)) GO TO 40                       V1038930
3894.             36           IV = ITADIR(I,2)                                           V1038940
3895.             37           JS = ITADIR(I,3)                                           V1038950
3896.             38           KA = ITADIR(I,4)                                           V1038960
3897.             39           LS = ITADIR(I,5)                                           V1038970
3898.             40           YN = 1.                                                    V1038980
3899.             41           IF (ITYPE .EQ. 2 .OR. ITYPE .EQ. 3) CALL TIRDLP(IVEH, JSUS, KAX,  V1038990
3900.                         1     LSIDE, IV, JS, KA, LS, IXY)                          V1039000
3901.             42           RETURN                                                     V1039010
3902.             43        40 WRITE (W,50) ITADIR(I,6), ITYPE                            V1039020
3903.             44        50 FORMAT ('0', '***** ERROR RETURN *****'/'***** ATTEMPT TO ASSIGN '  V1039030
3904.                          1        , ' PREVIOUS TABLE TYPE', I2, ' TO A TYPE', I2,   V1039040
3905.                          2        ' TABLE *****'/)                                  V1039050
3906.             45           CALL EXIT                                                  V1039060
3907.             46           RETURN                                                     V1039070
3908.                       C                                                             V1039080
3909.                       C   ECHO TABLES                                              V1039090
3910.                       C                                                             V1039100
3911.             47           ENTRY TABECH                                               V1039110
3912.             48           IF (ITCNT .EQ. 1) RETURN                                   V1039120
3913.             49           DO 60 I = 1, 4                                             V1039130
3914.             50        60 II(I) = 0                                                  V1039140
3915.             51           ITCNT = ITCNT - 1                                          V1039150
3916.             52           DO 70 I = 1, ITCNT                                         V1039160
3917.             53             ITYP = ITADIR(I,6)                                       V1039170
3918.             54             II(ITYP) = II(ITYP) + 1                                  V1039180
3919.             55             NC = II(ITYP)                                            V1039190
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   MTS          INTERNAL        **** F T N T I D Y ****
 LINE NO.       STMT NO.        INPUT LISTING

3920.              56              ITOT(ITYP,NO) = I                                                    V1039200
3921.              57          70 CONTINUE                                                              V1039210
3922.                       C                                                                         V1039220
3923.                       C    TABLES ARE NOW SORTED BY TYPE, IN ASCENDING NUMERIC SEQUENCE         V1039230
3924.                       C    II(ITYPE) HAS TOTAL NO. OF TABLES PER TYPE, ITOT(ITYPE,NO) HAS       V1039240
3925.                       C    THE TABLE POINTERS.  PROCEED TO PRINT OUT BY TYPE:                   V1039250
3926.                       C                                                                         V1039260
3927.              58               DO 310 I = 1, 4                                                    V1039270
3928.              59                 IF (II(I) .EQ. 0) GO TO 310                                      V1039280
3929.              60                 GO TO (80, 120, 190, 260), I                                     V1039290
3930.              61              80 WRITE (W,430) HEAD                                               V1039300
3931.              62                 LINE = 5                                                         V1039310
3932.              63                 WRITE (W,320)                                                    V1039320
3933.              64                 LINE = LINE + 5                                                  V1039330
3934.              65                 NO = II(I)                                                       V1039340
3935.              66                 DO 110 J = 1, NO                                                 V1039350
3936.              67                   INO = ITOT(I,J)                                                V1039360
3937.              68                   IV = ITADIR(INO,2)                                             V1039370
3938.              69                   IJ = ITADIR(INO,3)                                             V1039380
3939.              70                   IK = ITADIR(INO,4)                                             V1039390
3940.              71                   IL = ITADIR(INO,5)                                             V1039400
3941.              72                   NDUM = 1 + NOSPR(IV,IJ,IK,IL,2) - NOSPR(IV,IJ,IK,IL,1)        V1039410
3942.              73                   LINE = LINE + NDUM + 1                                         V1039420
3943.              74                   IF (LINE .LT. 40) GO TO 90                                     V1039430
3944.              75                   WRITE (W,430) HEAD                                             V1039440
3945.              76                   LINE = 0                                                       V1039450
3946.              77              90   CONTINUE                                                       V1039460
3947.              78                   WRITE (W,330) ITADIR(INO,1), NDUM                              V1039470
3948.              79                   IKK = NOSPR(IV,IJ,IK,IL,2)                                     V1039480
3949.              80                   IKKK = NOSPR(IV,IJ,IK,IL,1)                                    V1039490
3950.              81                   WRITE (W,340) (FORSPR(JJJ),DEFSPR(JJJ),JJJ=IKKK,IKK)           V1039500
3951.              82                   DO 100 IXKP = IKKK, IKK                                        V1039510
3952.              83                     DEFSPR(IXKP) = DEFSPR(IXKP) / 12.                            V1039520
3953.                       C                                                                         V1039530
3954.              84              100    CONTINUE                                                       V1039540
3955.              85              110  CONTINUE                                                       V1039550
3956.              86                   GO TO 310                                                      V1039560
3957.              87              120  WRITE (W,430) HEAD                                             V1039570
3958.              88                   LINE = 0                                                       V1039580
3959.              89              130  CONTINUE                                                       V1039590
3960.              90                   WRITE (W,350)                                                  V1039600
3961.              91                   NO = II(2)                                                     V1039610
3962.              92                   DO 180 J = 1, NO                                               V1039620
3963.              93                     INO = ITOT(I,J)                                              V1039630
3964.              94                     IV = ITADIR(INO,2)                                           V1039640
3965.              95                     IJ = ITADIR(INO,3)                                           V1039650
3966.              96                     IK = ITADIR(INO,4)                                           V1039660
3967.              97                     IL = ITADIR(INO,5)                                           V1039670
3968.              98                     WRITE (W,360) NTABXY(IV,IJ,IK,IL,1,2), NTABXY(IV,IJ,IK,IL,2,2)V1039680
3969.                                 1     , ITADIR(INO,1)                                            V1039690
3970.              99                     NVEL = NTABXY(IV,IJ,IK,IL,2,2)                               V1039700
3971.             100                     NEZ = NTABXY(IV,IJ,IK,IL,1,2) + 3                            V1039710
3972.             101                     DO 150 JJ = 1, NVEL                                          V1039720
3973.             102                       DO 150 KK = 4, NEZ                                         V1039730
3974.             103                         NMAX = NMAXVL(IV,IJ,IK,IL,KK,JJ)                         V1039740
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   MTS          INTERNAL      **** F T N T 1 0 Y ****
LINE NO.        STMT NO.      INPUT LISTING

3975.             104                 LINE = LINE + NMAX + 3                                                    V1039750
3976.             105                 IF (LINE .LT. 40) GO TO 140                                               V1039760
3977.             106                 WRITE (W,430) HEAD                                                        V1039770
3978.             107                 LINE = 0                                                                  V1039780
3979.             108       140       CONTINUE                                                                  V1039790
3980.             109                 WRITE (W,370) VBRK(IV,IJ,IK,IL,JJ + 3), EZBRK(IV,IJ,IK,IL,              V1039800
3981.                           1     KK)                                                                       V1039810
3982.             110                 WRITE (W,380) (V1BRK(IV,IJ,IK,IL,KK,JJ,LL),UXY(IV,IJ,IK,                 V1039820
3983.                           1     IL,LL,KK,JJ),LL=1,NMAX)                                                   V1039830
3984.             111       150     CONTINUE                                                                    V1039840
3985.             112               NN = N1ROLY(IV,IJ,IK,IL)                                                    V1039850
3986.             113               NM = N2ROLY(IV,IJ,IK,IL)                                                    V1039860
3987.             114               LINE = LINE + NN + 1                                                        V1039870
3988.             115               IF (LINE .LT. 40) GO TO 160                                                 V1039880
3989.             116               WRITE (W,430) HEAD                                                          V1039890
3990.             117               LINE = 0                                                                    V1039900
3991.             118       160     CONTINUE                                                                    V1039910
3992.             119               WRITE (W,390)                                                               V1039920
3993.             120               WRITE (W,440) (X1ROLY(IJK,IV,IJ,IK,IL),IJK=1,NN)                            V1039930
3994.             121               DO 170 IJK = 1, NM                                                          V1039940
3995.             122       170     WRITE (W,450) X2ROLY(IJK,IV,IJ,IK,IL), (XYROLY(IKK,IJK,IV,IJ,               V1039950
3996.                           1     IK,IL),IKK=1,NN)                                                          V1039960
3997.             123       180   CONTINUE                                                                      V1039970
3998.             124             GO TO 310                                                                     V1039980
3999.             125       190   WRITE (W,430) HEAD                                                            V1039990
4000.             126             LINE = 0                                                                      V1040000
4001.             127       200   CONTINUE                                                                      V1040010
4002.             128             WRITE (W,400)                                                                 V1040020
4003.             129             NC = II(3)                                                                    V1040030
4004.             130             DO 250 J = 1, NO                                                              V1040040
4005.             131               INC = ITOT(I,J)                                                             V1040050
4006.             132               IV = ITADIR(INO,2)                                                          V1040060
4007.             133               IJ = ITADIR(INO,3)                                                          V1040070
4008.             134               IK = ITADIR(INO,4)                                                          V1040080
4009.             135               IL = ITADIR(INO,5)                                                          V1040090
4010.             136               WRITE (W,360) NTABXY(IV,IJ,IK,IL,1,1), NTABXY(IV,IJ,IK,IL,2,1)V1040100
4011.                           1     , ITADIR(INO,1)                                                           V1040110
4012.             137               NVEL = NTABXY(IV,IJ,IK,IL,2,1)                                              V1040120
4013.             138               NEZ = NTABXY(IV,IJ,IK,IL,1,1)                                               V1040130
4014.             139               DO 220 JJ = 1, NVEL                                                         V1040140
4015.             140                 DO 220 KK = 1, NEZ                                                        V1040150
4016.             141                   NMAX = NMAXV1(IV,IJ,IK,IL,KK,JJ)                                        V1040160
4017.             142                   LINE = LINE + NMAX + 3                                                  V1040170
4018.             143                   IF (LINE .LT. 40) GO TO 210                                             V1040180
4019.             144                   WRITE (W,430) HEAD                                                      V1040190
4020.             145                   LINE = 0                                                                V1040200
4021.             146       210         CONTINUE                                                                V1040210
4022.             147                   WRITE (W,410) VBRK(IV,IJ,IK,IL,JJ), EZBRK(IV,IJ,IK,IL,KK)              V1040220
4023.             148                   WRITE (W,380) (V1BRK(IV,IJ,IK,IL,KK,JJ,LL),UXY(IV,IJ,IK,               V1040230
4024.                           1       IL,LL,KK,JJ),LL=1,NMAX)                                                 V1040240
4025.             149       220     CONTINUE                                                                    V1040250
4026.             150               MM = N1ROLX(IV,IJ,IK,IL)                                                    V1040260
4027.             151               MN = N2ROLX(IV,IJ,IK,IL)                                                    V1040270
4028.             152               LINE = LINE + MM + 1                                                        V1040280
4029.             153               IF (LINE .LT. 40) GO TO 230                                                 V1040290
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   MTS          INTERNAL        ****  P R I N T I D Y ****
 LINE NO.       STMT NO.        INPUT LISTING

 4030.            154                WRITE (W,430) HEAD                                                    V1040300
 4031.            155                LINE = 0                                                              V1040310
 4032.            156          230   CONTINUE                                                              V1040320
 4033.            157                WRITE (W,390)                                                         V1040330
 4034.            158                WRITE (W,440) (XLPOLX(IJK,IV,IJ,IK,IL),IJK=1,MM)                      V1040340
 4035.            159                DO 240 IMN = 1, MN                                                    V1040350
 4036.            160          240   WRITE (W,450) X2POLX(IMN,IV,IJ,IK,IL), (XYPOLX(IKK,IMN,IV,IJ,       V1040360
 4037.                          1     IK,IL),IKK=1,MM)                                                      V1040370
 4038.            161          250   CONTINUE                                                              V1040380
 4039.            162                GO TO 310                                                             V1040390
 4040.            163          260   WRITE (W,430) HEAD                                                    V1040400
 4041.            164                LINE = 0                                                              V1040410
 4042.            165          270   CONTINUE                                                              V1040420
 4043.            166                WRITE (W,420)                                                         V1040430
 4044.            167                NO = IT(4)                                                            V1040440
 4045.            168                DO 300 J = 1, NO                                                      V1040450
 4046.            169                  INO = ITOT(I,J)                                                     V1040460
 4047.            170                  IV = ITADIR(INO,2)                                                  V1040470
 4048.            171                  IJ = ITADIR(INO,3)                                                  V1040480
 4049.            172                  IK = ITADIR(INO,4)                                                  V1040490
 4050.            173                  IL = ITADIR(INO,5)                                                  V1040500
 4051.            174                  NDUM = NUM(IV,IJ,IK,IL,2) - NUM(IV,IJ,IK,IL,1) + 1                 V1040510
 4052.            175                  LINE = LINE + NDUM + 1                                              V1040520
 4053.            176                  IF (LINE .LT. 40) GO TO 290                                         V1040530
 4054.            177                  WRITE (W,430) HEAD                                                  V1040540
 4055.            178                  LINE = 0                                                            V1040550
 4056.            179          290     CONTINUE                                                            V1040560
 4057.            180                  WRITE (W,330) ITADIR(INO,1), NDUM                                   V1040570
 4058.            181                  IKKK = NUM(IV,IJ,IK,IL,1)                                           V1040580
 4059.            182                  IKK = NUM(IV,IJ,IK,IL,2)                                            V1040590
 4060.            183                  WRITE (W,340) (XX(IV,JJJ),YY(IV,JJJ),JJJ=IKKK,IKK)                  V1040600
 4061.            184                  DO 290 IJLK = IKKK, IKK                                             V1040610
 4062.            185          295     YY(IV,IJLK) = YY(IV,IJLK) / 12.                                     V1040620
 4063.            186          300   CONTINUE                                                              V1040630
 4064.            187          310 CONTINUE                                                                V1040640
 4065.            188              RETURN                                                                  V1040650
 4066.                           C                                                                        V1040660
 4067.                           C   FORMATS                                                              V1040670
 4068.                           C                                                                        V1040680
 4069.            189          320 FORMAT ('0', T10, 'SPRING TABLES'/T10, '--------------'/T100,          V1040690
 4070.                          1        'TABLE NO.', T15, 'NO. OF LINES', T65, 'DEFLECTION (IN)',        V1040700
 4071.                          2        T45, 'FORCE (LB)'/T100, '----------', T15, '------------',       V1040710
 4072.                          3        T65, '---', '------------', T45, '----------'/)                  V1040720
 4073.            190          330 FORMAT (T104, I3, T18, I3)                                            V1040730
 4074.            191          340 FORMAT (10(T47,F10.2,T65,F10.2/))                                     V1040740
 4075.            192          350 FORMAT ('0', T10, 'MU-Y VS ALPHA TABLES'/T10,                         V1040750
 4076.                          1        '----------------------'/)                                      V1040760
 4077.            193          360 FORMAT (' ', T100, 'TABLE NO.', T15, 'NO. OF LOADS', T30,             V1040770
 4078.                          1        'NO. OF ', 'VELOCITIES'/T100, '----------', T15,                V1040780
 4079.                          2        '------------', T30, '------------------'/T18, I3, T33, I3,     V1040790
 4080.                          3        T104, I3)                                                       V1040800
 4081.            194          370 FORMAT (T15, 'VELOCITY =', F6.2, ' FT/SEC', T40, 'LOAD = ', F10.2,    V1040810
 4082.                          1        ' LB'/T20, 'ALPHA (DEG)', T40, 'MU - Y'/T20, '-----------',      V1040820
 4083.                          2        T40, '------'/)                                                 V1040830
 4084.            195          380 FORMAT (10(T20,F10.2,T35,F10.2/))                                     V1040840
```

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   MTS          INTERNAL       **** P R N T I D Y ****
LINE NO.        STMT NO.       INPUT LISTING

4085.             196       390 FORMAT ('0', T10, 'ROLL-OFF TABLE'/T10, '--------------'/)          V1040850
4086.             197       400 FORMAT ('0', T10, 'MU-X VS. SLIP TABLES'/T10,                       V1040860
4087.                          1       '--------------------'/)                                     V1040870
4088.             198       410 FORMAT (T15, 'VELOCITY = ', F6.2, ' FT/SEC', T40, 'LOAD = ',        V1040880
4089.                          1       F10.2, ' LB'/T20, 'SLIP', T40, 'MU - X'/T20, '----', T40,    V1040890
4090.                          2       '------'/)                                                   V1040900
4091.             199       420 FORMAT ('0', T10, 'PRESSURE VS TORQUE TABLES'/T10, '------------',V1040910
4092.                          1       '--------------'/T100, 'TABLE NO', T15, 'NO. OF LINES',      V1040920
4093.                          2       T45, 'PRESSURE (PSI)', T65, 'TORQUE (IN-LB)'/T100,           V1040930
4094.                          3       '--------', T15, '------------', T45, '--------------',      V1040940
4095.                          4       T65, '--------------'/)                                      V1040950
4096.             200       430 FORMAT ('1', T36, 'ESRT TRUCK AND TRACTOR-TRAILER DYNAMIC ',        V1040960
4097.                          1       'RESPONSE SIMULATION - T3DRS,V1'//T36, 20A4///)              V1040970
4098.             201       440 FORMAT ('0', T37, 'SLIP'/T18, 'ALPHA', 10(2X,F10.2)/)              V1040980
4099.             202       450 FORMAT ('0', T15, 11(F10.2,2X))                                    V1040990
4100.                    C                                                                         V1041000
4101.             203            END                                                               V1041010
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES
EXIT		SUBR	45
TABDIR	(R*4)	ENTRY	140
TABECH	(R*4)	ENTRY	470
TABIN		SUBR	10
TIRDUP		SUBR	41
TIRET		SUBR	32
<EXIT>		SUBR	13 33 42 46 48 188

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES
ATQ	(R*4)	ARRAY	BRAKE	50
DEFSPR	(R*4)	ARRAY	SPRING	40 81 83*
DTHAX	(R*4)	ARRAY	SPRING	40
DV	(R*4)	ARRAY	SPRING	40
DZAXLE	(R*4)	ARRAY	SPRING	40
FORSPR	(R*4)	ARRAY	SPRING	40 81
FZBRK	(R*4)	ARRAY	TIPTAB	60 109 147
HEAD	(R*4)	ARRAY	PAGE	30 61 75 87 106 116 125 144 154 163 177
I	(I*4)			9* 11 17* 18 35 36 37 38 39 43 49* 50
				52* 53 56 58* 59 60 65 67 93 131 169
IBK	(I*4)		BRAKE	50
II	(I*4)	ARRAY		70 50* 54* 55 59 65 91 125 167
IJ	(I*4)			69* 72 79 80 95* 98 99 100 103 109 110 112
				113 120 122 133* 136 137 138 141 147 148 150 151
				158 160 171* 174 181 182
IJK	(I*4)			120* 121* 122 158*
IJLK	(I*4)			184* 185
IK	(I*4)			70* 72 79 80 96* 98 99 100 103 109 110 112
				113 120 122 134* 136 137 138 141 147 148 150 151
				158 160 172* 174 181 182
IKK	(I*4)			79* 81 82 122* 160* 182* 183 184
IKKK	(I*4)			80* 81 82 181* 183 184
IL	(I*4)			71* 72 79 80 97* 98 99 100 103 109 110 112
				113 120 122 135* 136 137 138 141 147 148 150 151
				158 160 173* 174 181 182
IMN	(I*4)			159* 160
INO	(I*4)			67* 68 69 70 71 78 93* 94 95 96 97 98
				131* 132 133 134 135 136 169* 170 171 172 173 180
ITADIR	(I*4)	ARRAY		80 11* 18 20* 21* 22* 23* 24* 25* 35 36 37
				38 39 43 53 68 69 70 71 78 94 95 96
				97 98 132 133 134 135 136 170 171 172 173 180
ITCNT	(I*4)			12* 17 20 21 22 23 24 25 31* 48 51* 52
ITOT	(I*4)	ARRAY		70 56* 67 93 131 169
ITYP	(I*4)			53* 54 55 56
ITYPE	(I*4)			14 16 25 32 35 41 43
IV	(I*4)			14 24* 32? 36* 41? 68* 72 79 80 94* 98 99
				100 103 105 110 112 113 120 122 132* 136 137 138
				141 147 148 150 151 158 160 170* 174 181 182 183
				185
IVEH	(I*4)			14 21 26 41?
IXKP	(I*4)			82* 83
IXY	(I*4)			15* 16* 32? 41?

J	(I*4)			10*	11	66*	67	92*	93	130*	131	168*	169		
JJ	(I*4)			101*	103	109	110	139*	141	147	148				
JJJ	(I*4)			81*	183*										
JS	(I*4)			14	27*	327	37*	417							
JSUS	(I*4)			14	22	27	417								
KA	(I*4)			14	29*	327	39*	417							
KAX	(I*4)			14	23	28	417								
KK	(I*4)			102*	103	109	110	140*	141	147	148				
LINE	(I*4)			62*	64*	73*	74	76*	88*	104*	105	107*	114*	115	117*
				126*	142*	143	145*	152*	153	155*	164*	175*	176	178*	
LL	(I*4)			110*	148*										
LS	(I*4)			14	29*	327	39*	417							
LSIDE	(I*4)			14	24	25	417								
MM	(I*4)			150*	152	158	160								
MN	(I*4)			151*	159										
NDUM	(I*4)			72*	73	78	174*	175	180						
NEZ	(I*4)			100*	102	138*	140								
NM	(I*4)			113*	121										
NMAX	(I*4)			103*	104	110	141*	142	148						
NMAXVI	(I*4)	ARRAY	TIRTAB	60	103	141									
NN	(I*4)			112*	114	120	122								
NO	(I*4)			55*	56	65*	66	91*	92	129*	130	167*	168		
NOSPR	(I*4)	ARRAY	SPRING	40	72	75	80								
NP	(I*4)		PAGE	30											
NTABXY	(I*4)	ARRAY	TIRTAB	60	98	99	100	136	137	138					
NTP	(I*4)	ARRAY	BRAKE	50											
NUM	(I*4)	ARRAY	BRAKE	50	174	181	182								
NVEL	(I*4)			99*	101	137*	139								
N1ROLX	(I*4)	ARRAY	TIRTAB	60	150										
N1ROLY	(I*4)	ARRAY	TIRTAB	60	112										
N2ROLX	(I*4)	ARRAY	TIRTAB	60	151										
N2ROLY	(I*4)	ARRAY	TIRTAB	60	113										
P	I*4		PAGE	20	30										
S	(R*4)	ARRAY	SPRING	40											
SD	(R*4)	ARRAY	SPRING	40											
THETAX	(R*4)	ARRAY	SPRING	40											
TN	(R*4)			14	18	20									
TQ	(R*4)	ARRAY	BRAKE	50											
UXY	(R*4)	ARRAY	TIRTAB	60	110	148									
VBRK	(R*4)	ARRAY	TIRTAB	60	109	147									
VIBRK	(R*4)	ARRAY	TIRTAB	60	110	149									
W	I*4		PAGE	20	30	43k	61W	63W	75k	78k	81W	87W	90W	98k	106W
				109W	110W	116W	119W	120W	122k	125W	128W	136W	144W	147W	148W
				154k	157W	158k	160k	163W	166k	177k	180W	183W			
XLOAD	(R*4)	ARRAY	SPRING	40											
XTP	(R*4)	ARRAY	BRAKE	50											
XX	(R*4)	ARRAY	BRAKE	50	183										
XYROLX	(R*4)	ARRAY	TIRTAB	60	160										
XYROLY	(R*4)	ARRAY	TIRTAB	60	122										
X1ROLX	(R*4)	ARRAY	TIRTAB	60	159										
X1ROLY	(R*4)	ARRAY	TIRTAB	60	120										
X2ROLX	(R*4)	ARRAY	TIRTAB	60	160										
X2ROLY	(R*4)	ARRAY	TIRTAB	60	122										
YN	(R*4)			14	30*	40*									
YTP	(R*4)	ARRAY	BRAKE	50											
YY	(R*4)	ARRAY	BRAKE	50	183	185*									
ZAXLE	(R*4)	ARRAY	SPRING	40											
ZO	(R*4)	ARRAY	SPRING	40											

1 98 136
2 98 136

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES								
10	11		9	10							
20	19		17								
30	34		18								
40	43		35								
50	44	FMT	43								
60	50		49								
70	57		52								
80	61		60								
90	77		74								
100	84		82								
110	85		66								
120	87		60								
130	89										
140	108		105								
150	111		101	102							
160	118		115								
170	122		121								
180	123		92								
190	125		60								
200	127										
210	146		143								
220	149		139	140							
230	156		153								
240	160		159								
250	161		130								
260	163		60								
270	165										
280	179		176								
290	185		184								
300	186		168								
310	187		58	59	86	124	162				
320	189	FMT	63								
330	190	FMT	78	180							
340	191	FMT	91	193							
350	192	FMT	90								
360	193	FMT	99	136							
370	194	FMT	109								
380	195	FMT	110	148							
390	196	FMT	119	157							
400	197	FMT	129								
410	198	FMT	147								
420	199	FMT	166								
430	200	FMT	61	75	87	106	116	125	144	154	163	177
440	201	FMT	120	158							
450	202	FMT	122	160							

TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MCTION

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  MTS          INTERNAL       **** F T N T I C Y ****
LINE NO.       STMT NO.       INPUT LISTING

4102.                    C                                                                    V1041020
4103.                    C   ***   SUBROUTINE ANTLKR ***                                      V1041030
4104.                    C                                                                    V1041040
4105.              1           SUBROUTINE ANTLKR(IU, IS, IA, ILR)                             V1041050
4106.              2           IMPLICIT INTEGER(I - O)                                        V1041060
4107.              3           IMPLICIT LOGICAL*1(C)                                          V1041070
4108.              4           INTEGER R, WR                                                  V1041080
4109.              5           REAL*8 DES(60), SIDE(2)                                        V1041090
4110.              6           DIMENSION CNI(32)                                              V1041100
4111.              7           DIMENSION FO(32)                                               V1041110
4112.              8           DIMENSION CNI(32), CFFI(32), ONTI(32), CFFII(32), OPI(32),     V1041120
4113.                         1           IXLSTI(32), IYLSTI(32), IONI(32), ICFFI(32), ONEI(32),  V1041130
4114.                         2           WDLSTI(32), TLSTI(32), WII(32), TII(32), T2I(32),  V1041140
4115.                         3           T3I(32), T4I(32), TCI(32), VALSTI(32)              V1041150
4116.              9           DIMENSION IGPVKY(32), NTCPV(32,5)                              V1041160
4117.             10           DIMENSION RIDGPV(5,4,32,5), GPVV(5,5,32,5), GPV(5)             V1041170
4118.             11           COMMON /PAGE/ NP, HEAD(20), R, WR                              V1041180
4119.             12           COMMON /ANTLK/ IALOPI(32), IOP(32), ILOCK                      V1041190
4120.             13           DIMENSION NTF(4,32), NTN(4,32), LC(8,32), IOP12(32), IOP23(32),  V1041200
4121.                         1           IOP34(32), IOP56(32), IOP67(32), ICP78(32), IUP(32),  V1041210
4122.                         2           IDOWN(32)                                          V1041220
4123.             14           DIMENSION IPKEY(32), IPDKEY(32), IPWMKY(32), ICSKEY(32)        V1041230
4124.             15           DIMENSION RID(8,5,4,32), CFFF(8,5,5,32), TAU1(32), TAU2(32),   V1041240
4125.                         1           TAU3(32), TAU4(32), RIDF(5,4,32), FF(5,5,32),      V1041250
4126.                         2           RIDG(5,4,32), GG(5,5,32), ALX1(32), ALX2(32), ALX3(32),  V1041260
4127.                         3           ALX4(32), PFF1(32), PFF2(32), PFF3(32), PRF1(32),  V1041270
4128.                         4           PRF2(32), PRF3(32), RIDR(5,4,32), RR(5,5,32),      V1041280
4129.                         5           RIDS(5,4,32), SS(5,5,32), ALX5(32), ALX6(32), ALX7(32),  V1041290
4130.                         6           ALX8(32), PFL1(32), PFL2(32), PFL3(32), PRL1(32),  V1041300
4131.                         7           PRL2(32), PRL3(32), TAUON(32), TAUOFF(32), TAUW(32),  V1041310
4132.                         8           TAUWD(32), WID(5,4,32), WW(5,5,32), VID(5,4,32),   V1041320
4133.                         9           VV(5,5,32), RIDPW(5,4,32), PW(5,5,32), Z1(32), Z2(32),  V1041330
4134.                         *           Z3(32), Z4(32), Z5(32), ISMPLE(32), FIMO(8), EPSI(23),  V1041340
4135.                         1           VARIB(60,32), BUFID(5,4,32), BUFCOF(5,5,32), PERIOD(32)  V1041350
4136.             16           DIMENSION IMOD(32), CLOCKO(32)                                 V1041360
4137.             17           DIMENSION BUF(5), IBF(4), ISMPO(32), ALW1(32), ALW2(32)        V1041370
4138.             18           DIMENSION NOFF(32), NON(32), NT1(32), NT2(32), NT3(32), NT4(32),  V1041380
4139.                         1           NTPDR(32), NTPDF(32), NTPWM(32), OPTION(32)        V1041390
4140.             19           DIMENSION FZ(5,3,32), ZIC(2,32), ZOR(2,32), RMCPE(32)          V1041400
4141.             20           DIMENSION IGPKEY(32), NTCP(32)                                 V1041410
4142.             21           DIMENSION RIDGP(5,4,32), GP(5,5,32)                            V1041420
4143.             22           DIMENSION INEW(32,5), NTCS(32,5), NTCLR(32,5)                  V1041430
4144.             23           DIMENSION RIDOS(5,4,32,5), WOS(5,5,32,5), TOS(32,5), TNEW(32,5),  V1041440
4145.                         1           RIDCLR(5,4,32,5), WCLR(5,5,32,5), FCS(5), WWDIF(32)  V1041450
4146.             24           DATA IWRITE /0/                                                V1041460
4147.             25           DATA SIDE /'  LEFT  ', '  RIGHT '/                             V1041470
4148.             26           DATA DES /'1.0     ', 'TIME    ', 'OMEGA   ', 'OMEGADOT',     V1041480
4149.                         1      'XDOT    ', 'XDDOT   ', 'POFF1   ', 'POFF2   ', 'PON1    ',  V1041490
4150.                         2      'PON2    ', 'TOFF1   ', 'TONL    ', 'XDOFF   ', 'XDON    ',  V1041500
4151.                         3      'WOFF    ', 'WON     ', 'WDOFF   ', 'WDON    ', 'WDMAX   ',  V1041510
4152.                         4      'WDMIN   ', 'IPMAX1  ', 'IPMIN1  ', 'WLOCK   ', 'TLOCK   ',  V1041520
4153.                         5      'SLON    ', 'SLOFF   ', 'PMAX1   ', 'PMAX2   ', 'PMIN1   ',  V1041530
4154.                         6      'PMIN2   ', 'PE      ', 'ON      ', 'TMOD    ', 'SLIP    ',  V1041540
4155.                         7      'P       ', 'CYCNT   ', 'SQUARE  ', 'SQLARA  ', 'TOFF2   ',  V1041550
4156.                         8      'TON2    ', 'FCS1    ', 'FOS2    ', 'FOS3    ', 'GPCNT   ',  V1041560
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  MTS          INTERNAL       **** F T N T I D Y ****
LINE NO.       STMT NO.       INPUT LISTING

4157.                     9      'WMAX1   ', 'WMAX2   ', 'TWMAX1  ', 'TWMAX2  ', 'WMIN    ',  V1041570
4158.                     *      'TWMIN   ', 'TPMAX2  ', 'TPMIN2  ', 'GPV1    ', 'GPV2    ',  V1041580
4159.                     1      'GPV3    ', 'GPV4    ', 'GPV5    ', 'EQS4    ', 'EQS5    ',  V1041590
4160.                     2      'CMEGDIF '/                                                  V1041600
4161.                C                                                                         V1041610
4162.                C READ ANTILOCK INPUT                                                    V1041620
4163.                C                                                                         V1041630
4164.            27          READ (R,10) TN                                                   V1041640
4165.            28       10 FORMAT (F10.3)                                                   V1041650
4166.            29          L = 8 * (IU - 1) + 4 * (IS - 1) + 2 * (IA - 1) + ILR             V1041660
4167.            30          IF (TN .EQ. 0.) IALOPT(L) = 0                                    V1041670
4168.            31          IF (TN .EQ. 0.) GO TO 540                                        V1041680
4169.            32          ITYP = 6                                                         V1041690
4170.            33          CALL TABDIR(TN, IU, IS, IA, ILR, IU1, IS1, IA1, ILR1, YN, ITYP)  V1041700
4171.            34          IALOPT(L) = -1                                                   V1041710
4172.            35          IF (YN .EQ. 1) IALOPT(L) = 8 * (IU1 - 1) + 4 * (IS1 - 1) + 2 * (  V1041720
4173.                       1IA1 - 1) + ILR1                                                  V1041730
4174.            36          IF (IALOPT(L) .LE. - 1) GO TO 20                                 V1041740
4175.            37          IF (IALOPT(L) .GE. L) IALOPT(L) = 1                              V1041750
4176.            38          GO TO 540                                                        V1041760
4177.            39       20 CONTINUE                                                         V1041770
4178.            40          READ (R,290) OPTION(L)                                           V1041780
4179.            41          READ (R,120) WWDIF(L)                                            V1041790
4180.            42          READ (R,30) NOFF(L)                                              V1041800
4181.            43          JDUM = NOFF(L)                                                   V1041810
4182.            44       30 FORMAT (I1)                                                      V1041820
4183.            45          DO 60 I = 1, JDUM                                                V1041830
4184.            46            READ (R,30) IDUM                                               V1041840
4185.            47            NTF(I,L) = IDUM                                                V1041850
4186.            48            DO 40 J = 1, IDUM                                              V1041860
4187.            49         40   READ (R,100) (RID(I,J,K,L),K=1,4)                           V1041870
4188.            50            DO 50 J = 1, IDUM                                              V1041880
4189.            51         50   READ (R,110) (COFF(I,J,K,L),K=1,5)                          V1041890
4190.            52         60 CONTINUE                                                       V1041900
4191.            53          READ (R,30) NCN(L)                                               V1041910
4192.            54          NN = NCN(L) + 4                                                  V1041920
4193.            55          DO 90 I = 5, NN                                                  V1041930
4194.            56            READ (R,30) IDUM                                               V1041940
4195.            57            NTN(I - 4,L) = IDUM                                            V1041950
4196.            58            DO 70 J = 1, IDUM                                              V1041960
4197.            59         70   READ (R,100) (RID(I,J,K,L),K=1,4)                           V1041970
4198.            60            DO 80 J = 1, IDUM                                              V1041980
4199.            61         80   READ (R,110) (COFF(I,J,K,L),K=1,5)                          V1041990
4200.            62         90 CONTINUE                                                       V1042000
4201.            63        100 FORMAT (4E10.5)                                                V1042010
4202.            64        110 FORMAT (5E10.5)                                                V1042020
4203.            65          READ (R,100) TAU1(L), TAU2(L), TAU3(L), TAU4(L)                  V1042030
4204.            66        120 FORMAT (E10.5)                                                 V1042040
4205.            67          READ (R,30) IPKEY(L)                                             V1042050
4206.            68          IF (IPKEY(L) .EQ. 1) GO TO 190                                   V1042060
4207.            69          READ (R,30) NTI(L)                                               V1042070
4208.            70          IDUM = NTI(L)                                                    V1042080
4209.            71          DO 130 J = 1, IDUM                                               V1042090
4210.            72        130 READ (R,100) (RIC(J,K,L),K=1,4)                                V1042100
4211.            73          DO 140 J = 1, IDUM                                               V1042110
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   MTS          INTERNAL       ****  F T N T I O Y ****
 LINE NO.       STMT NO.       INPUT LISTING

 4212.            74       140 READ (R,11C) ((EE(J,K,L),K=1,5)                                                    V1042120
 4213.            75           READ (R,30) NT2(L)                                                                 V1042130
 4214.            76           IDUM = NT2(L)                                                                      V1042140
 4215.            77           DO 150 J = 1, IDUM                                                                 V1042150
 4216.            78       150 READ (R,100) (RIDG(J,K,L),K=1,4)                                                   V1042160
 4217.            79           DO 160 J = 1, IDUM                                                                 V1042170
 4218.            80       160 READ (R,11C) (GG(J,K,L),K=1,5)                                                     V1042180
 4219.            81           READ (R,240) ALX1(L), ALX2(L), ALX3(L), ALX4(L)                                    V1042190
 4220.            82           READ (R,39C) PEE1(L), PEE2(L), PEE3(L), PRE1(L), PRE2(L), PRE3(L)                  V1042200
 4221.            83       170 FORMAT (6F10.5)                                                                    V1042210
 4222.            84       180 IF (IPKEY(L) .EC. 0) GO TC 230                                                     V1042220
 4223.            85           READ (R,30) NT3(L)                                                                 V1042230
 4224.            86           IDUM = NT3(L)                                                                      V1042240
 4225.            87           DO 190 J = 1, IDUM                                                                 V1042250
 4226.            88       19C READ (R,100) (RIDR(J,K,L),K=1,4)                                                   V1042260
 4227.            89           DO 200 J = 1, IDUM                                                                 V1042270
 4228.            90       2CC READ (R,110) (RR(J,K,L),K=1,5)                                                     V1042280
 4229.            91           READ (R,30) NT4(L)                                                                 V1042290
 4230.            92           IDUM = NT4(L)                                                                      V1042300
 4231.            93           DO 210 J = 1, IDUM                                                                 V1042310
 4232.            94       210 READ (R,100) (RIDS(J,K,L),K=1,4)                                                   V1042320
 4233.            95           DO 220 J = 1, IDUM                                                                 V1042330
 4234.            96       220 READ (R,11C) (SS(J,K,L),K=1,5)                                                     V1042340
 4235.            97           READ (R,240) ALX5(L), ALX6(L), ALX7(L), ALX8(L)                                    V1042350
 4236.            98           READ (R,390) PEL1(L), PEL2(L), PEL3(L), PRL1(L), PRL2(L), PRL3(L)                  V1042360
 4237.            99       230 READ (R,240) TALON(L), TAUCEE(L)                                                   V1042370
 4238.           100       240 FORMAT (2E10.5)                                                                    V1042380
 4239.           101           READ (R,240) TAUW(L), TAUWD(L)                                                     V1042390
 4240.           102           DO 250 I = 1, 8                                                                    V1042400
 4241.           103       250 LC(I,L) = 0                                                                        V1042410
 4242.           104           IDUM = NCEE(L)                                                                     V1042420
 4243.           105           DO 260 I = 1, IDUM                                                                 V1042430
 4244.           106       260 LC(I,L) = 1                                                                        V1042440
 4245.           107           NN = NCN(L) + 4                                                                    V1042450
 4246.           108           DC 270 I = 5, NN                                                                   V1042460
 4247.           109       270 LC(I,L) = 1                                                                        V1042470
 4248.           110           READ (R,28C) ICP12(L), ICP23(L), ICP34(L)                                          V1042480
 4249.           111           READ (R,280) ICP56(L), ICP67(L), ICP78(L)                                          V1042490
 4250.           112       28C FCRMAT (3I1)                                                                       V1042500
 4251.           113           READ (R,29C) IPDKEY(L)                                                             V1042510
 4252.           114       290 FCRMAT (I2)                                                                        V1042520
 4253.           115           IF (IPDKEY(L) .LE. - 1) GC TO 340                                                  V1042530
 4254.           116           READ (R,30) NTPDR(L)                                                               V1042540
 4255.           117           IDUM = NTPDR(L)                                                                    V1042550
 4256.           118           DO 300 J = 1, IDUM                                                                 V1042560
 4257.           119       30C READ (R,100) (WIC(J,K,L),K=1,4)                                                    V1042570
 4259.           120           DO 310 J = 1, IDUM                                                                 V1042580
 4259.           121       31C READ (R,110) (WW(J,K,L),K=1,5)                                                     V1042590
 4260.           122           READ (R,30) NTPDE(L)                                                               V1042600
 4261.           123           IDUM = NTPDE(L)                                                                    V1042610
 4262.           124           DO 320 J = 1, IDUM                                                                 V1042620
 4263.           125       320 READ (R,100) (VIC(J,K,L),K=1,4)                                                    V1042630
 4264.           126           DO 330 J = 1, IDUM                                                                 V1042640
 4265.           127       330 READ (R,110) (VV(J,K,L),K=1,5)                                                     V1042650
 4266.           128       340 CONTINUE                                                                           V1042660
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MTS LINE NO.	INTERNAL STMT NO.	**** I N T I D Y **** INPUT LISTING	
4267.	129	READ (R,290) IPWMKY(L)	V1042670
4268.	130	IF (IPWMKY(L) .LE. - 1) GO TO 400	V1042680
4269.	131	READ (R,120) PERIOD(L)	V1042690
4270.	132	READ (R,30) NTPWM(L)	V1042700
4271.	133	IDUM = NTPWM(L)	V1042710
4272.	134	DO 350 J = 1, IDUM	V1042720
4273.	135	350 READ (R,100) (RIDPW(J,K,L),K=1,4)	V1042730
4274.	136	DO 360 J = 1, IDUM	V1042740
4275.	137	360 READ (R,110) (PW(J,K,L),K=1,5)	V1042750
4276.	138	READ (R,110) Z1(L), Z2(L), Z3(L), Z4(L), Z5(L)	V1042760
4277.	139	READ (R,370) (EZ(K,1,L),K=1,5), RMORE(L)	V1042770
4278.	140	370 FORMAT (6F10.4)	V1042780
4279.	141	IF (ABS(RMORE(L)) .LT. .001) GO TO 400	V1042790
4280.	142	READ (R,380) (EZ(K,2,L),K=1,5), ZID(1,L), ZBR(1,L)	V1042800
4281.	143	READ (R,380) (EZ(K,3,L),K=1,5), ZID(2,L), ZBR(2,L)	V1042810
4282.	144	380 FORMAT (7F10.4)	V1042820
4283.	145	390 FORMAT (3F10.5)	V1042830
4284.	146	400 CONTINUE	V1042840
4285.	147	READ (R,290) IOSKEY(L)	V1042850
4286.	148	IF (IOSKEY(L) .LE. - 1) GO TO 460	V1042860
4287.	149	DO 450 KK = 1, 5	V1042870
4288.	150	READ (R,30) NTOS(L,KK)	V1042880
4289.	151	IDUM = NTOS(L,KK)	V1042890
4290.	152	IF (IDUM .LE. 0) GO TO 450	V1042900
4291.	153	DO 410 J = 1, IDUM	V1042910
4292.	154	410 READ (R,100) (RIDOS(J,K,L,KK),K=1,4)	V1042920
4293.	155	DO 420 J = 1, IDUM	V1042930
4294.	156	420 READ (R,110) (WOS(J,K,L,KK),K=1,5)	V1042940
4295.	157	READ (R,30) NTCLR(L,KK)	V1042950
4296.	158	IDUM = NTCLR(L,KK)	V1042960
4297.	159	IF (IDUM .LE. 0) GO TO 450	V1042970
4298.	160	DO 430 J = 1, IDUM	V1042980
4299.	161	430 READ (R,100) (RIDCLR(J,K,L,KK),K=1,4)	V1042990
4300.	162	DO 440 J = 1, IDUM	V1043000
4301.	163	440 READ (R,110) (WCLR(J,K,L,KK),K=1,5)	V1043010
4302.	164	READ (R,120) TOS(L,KK)	V1043020
4303.	165	450 CONTINUE	V1043030
4304.	166	460 READ (R,290) IGPKEY(L)	V1043040
4305.	167	IF (IGPKEY(L) .LE. - 1) GO TO 490	V1043050
4306.	168	READ (R,30) NTGP(L)	V1043060
4307.	169	IDUM = NTGP(L)	V1043070
4308.	170	DO 470 J = 1, IDUM	V1043080
4309.	171	470 READ (R,100) (RIDGP(J,K,L),K=1,4)	V1043090
4310.	172	DO 480 J = 1, IDUM	V1043100
4311.	173	480 READ (R,110) (GP(J,K,L),K=1,5)	V1043110
4312.	174	490 CONTINUE	V1043120
4313.	175	READ (R,290) IGPVKY(L)	V1043130
4314.	176	IF (IGPVKY(L) .LE. - 1) GO TO 530	V1043140
4315.	177	DO 520 KK = 1, 5	V1043150
4316.	178	READ (R,30) NTGPV(L,KK)	V1043160
4317.	179	IDUM = NTGPV(L,KK)	V1043170
4318.	180	IF (IDUM .LE. 0) GO TO 520	V1043180
4319.	181	DO 500 J = 1, IDUM	V1043190
4320.	182	500 READ (R,100) (RIDGPV(J,K,L,KK),K=1,4)	V1043200
4321.	183	DO 510 J = 1, IDUM	V1043210

MTS LINE NO.	INTERNAL STMT NO.	**** F T N T I D Y **** INPUT LISTING	
4322.	184	510 READ (R,110) (GPVV(J,K,L,KK),K=1,5)	V1043220
4323.	185	520 CONTINUE	V1043230
4324.	186	530 READ (R,120) ISMPLE(L)	V1043240
4325.	187	540 CONTINUE	V1043250
4326.	188	IRETRN = 0	V1043260
4327.	189	IF (IALOPT(L) .LE. - 1) GO TO 670	V1043270
4328.	190	IF (IALOPT(L) .EQ. 0) GO TO 670	V1043280
4329.	191	LL = IALOPT(L)	V1043290
4330.	192	DO 610 J = 1, 5	V1043300
4331.	193	DO 570 K = 1, 4	V104331C
4332.	194	DO 550 I = 1, 8	V1043320
4333.	195	550 RID(I,J,K,L) = RID(I,J,K,LL)	V1043330
4334.	196	RIDF(J,K,L) = RIDF(J,K,LL)	V104334C
4335.	197	RIDG(J,K,L) = RIDG(J,K,LL)	V1043350
4336.	198	RIDR(J,K,L) = RIDR(J,K,LL)	V1043360
4337.	199	RIDS(J,K,L) = RIDS(J,K,LL)	V104337C
4338.	200	WID(J,K,L) = WID(J,K,LL)	V1043380
4339.	201	VID(J,K,L) = VID(J,K,LL)	V104339C
4340.	202	RIDPW(J,K,L) = RIDPW(J,K,LL)	V1043400
4341.	203	RIDGP(J,K,L) = RIDGP(J,K,LL)	V1043410
4342.	204	DO 560 KK = 1, 5	V1043420
4343.	205	RIDOS(J,K,L,KK) = RIDOS(J,K,LL,KK)	V1043430
4344.	206	RIDCLR(J,K,L,KK) = RIDCLR(J,K,LL,KK)	V1043440
4345.	207	560 RIDGPV(J,K,L,KK) = RIDGPV(J,K,LL,KK)	V1043450
4346.	208	570 CONTINUE	V1043460
4347.	209	DO 600 K = 1, 5	V1043470
4348.	210	DO 580 I = 1, 8	V1043480
4349.	211	580 COFF(I,J,K,L) = COFF(I,J,K,LL)	V1043490
4350.	212	FF(J,K,L) = FF(J,K,LL)	V1043500
4351.	213	GG(J,K,L) = GG(J,K,LL)	V1043510
4352.	214	RR(J,K,L) = RR(J,K,LL)	V1043520
4353.	215	SS(J,K,L) = SS(J,K,LL)	V1043530
4354.	216	WW(J,K,L) = WW(J,K,LL)	V104354C
4355.	217	VV(J,K,L) = VV(J,K,LL)	V1043550
4356.	218	PW(J,K,L) = PW(J,K,LL)	V1043560
4357.	219	GP(J,K,L) = GP(J,K,LL)	V1043570
4358.	220	DO 590 KK = 1, 5	V1043580
4359.	221	WOS(J,K,L,KK) = WOS(J,K,LL,KK)	V1043590
4360.	222	WCLR(J,K,L,KK) = WCLR(J,K,LL,KK)	V1043600
4361.	223	590 GPVV(J,K,L,KK) = GPVV(J,K,LL,KK)	V1043610
4362.	224	600 CONTINUE	V1043620
4363.	225	NTF(J,L) = NTF(J,LL)	V1043630
4364.	226	NTN(J,L) = NTN(J,LL)	V1043640
4365.	227	610 CONTINUE	V1043650
4366.	228	DO 620 I = 1, 8	V1043660
4367.	229	620 LC(I,L) = LC(I,LL)	V1043670
4368.	230	IOP12(L) = IOP12(LL)	V1043680
4369.	231	IOP23(L) = IOP23(LL)	V1043690
4370.	232	IOP34(L) = IOP34(LL)	V1043700
4371.	233	IOP56(L) = IOP56(LL)	V1043710
4372.	234	IOP67(L) = IOP67(LL)	V1043720
4373.	235	IOP78(L) = IOP78(LL)	V1043730
4374.	236	TAU1(L) = TAU1(LL)	V1043740
4375.	237	TAU2(L) = TAU2(LL)	V1043750
4376.	238	TAU3(L) = TAU3(LL)	V1043760

MTS LINE NO.	INTERNAL STMT NO.	**** F T N T I D Y **** INPUT LISTING	
4377.	239	TAU4(L) = TAU4(LL)	V1043770
4378.	240	ALX1(L) = ALX1(LL)	V1043780
4379.	241	ALX2(L) = ALX2(LL)	V1043790
4380.	242	ALX3(L) = ALX3(LL)	V1043800
4381.	243	ALX4(L) = ALX4(LL)	V1043810
4382.	244	PFE1(L) = PFE1(LL)	V1043820
4383.	245	PFE2(L) = PFE2(LL)	V1043830
4384.	246	PFE3(L) = PFE3(LL)	V1043840
4385.	247	PRE1(L) = PRE1(LL)	V1043850
4386.	248	PRE2(L) = PRE2(LL)	V1043860
4387.	249	PRE3(L) = PRE3(LL)	V1043870
4388.	250	ALX5(L) = ALX5(LL)	V1043880
4389.	251	ALX6(L) = ALX6(LL)	V1043890
4390.	252	ALX7(L) = ALX7(LL)	V1043900
4391.	253	ALX8(L) = ALX8(LL)	V1043910
4392.	254	PFL1(L) = PFL1(LL)	V1043920
4393.	255	PFL2(L) = PFL2(LL)	V1043930
4394.	256	PFL3(L) = PFL3(LL)	V1043940
4395.	257	PRL1(L) = PRL1(LL)	V1043950
4396.	258	PRL2(L) = PRL2(LL)	V1043960
4397.	259	PRL3(L) = PRL3(LL)	V1043970
4398.	260	TAUON(L) = TAUON(LL)	V1043980
4399.	261	TAUCFF(L) = TAUCFF(LL)	V1043990
4400.	262	TAUW(L) = TAUW(LL)	V1044000
4401.	263	TAUWD(L) = TAUWD(LL)	V1044010
4402.	264	Z1(L) = Z1(LL)	V1044020
4403.	265	Z2(L) = Z2(LL)	V1044030
4404.	266	Z3(L) = Z3(LL)	V1044040
4405.	267	Z4(L) = Z4(LL)	V1044050
4406.	268	Z5(L) = Z5(LL)	V1044060
4407.	269	DO 630 J = 1, 5	V1044070
4408.	270	DO 630 K = 1, 3	V1044080
4409.	271	EZ(J,K,L) = EZ(J,K,LL)	V1044090
4410.	272	630 CONTINUE	V1044100
4411.	273	DO 640 J = 1, 2	V1044110
4412.	274	ZTD(J,L) = ZTD(J,LL)	V1044120
4413.	275	640 ZBR(J,L) = ZBR(J,LL)	V1044130
4414.	276	RMORE(L) = RMORE(LL)	V1044140
4415.	277	IPKEY(L) = IPKEY(LL)	V1044150
4416.	278	IPDKEY(L) = IPDKEY(LL)	V1044160
4417.	279	IPWMKY(L) = IPWMKY(LL)	V1044170
4418.	280	IDSKEY(L) = IDSKEY(LL)	V1044180
4419.	281	IGPKEY(L) = IGPKEY(LL)	V1044190
4420.	282	IGPVKY(L) = IGPVKY(LL)	V1044200
4421.	283	PERIOD(L) = PERIOD(LL)	V1044210
4422.	284	NOFF(L) = NOFF(LL)	V1044220
4423.	285	NON(L) = NON(LL)	V1044230
4424.	286	NT1(L) = NT1(LL)	V1044240
4425.	287	NT2(L) = NT2(LL)	V1044250
4426.	288	NT3(L) = NT3(LL)	V1044260
4427.	289	NT4(L) = NT4(LL)	V1044270
4428.	290	NTPDF(L) = NTPDF(LL)	V1044280
4429.	291	NTPDR(L) = NTPDR(LL)	V1044290
4430.	292	NTPWM(L) = NTPWM(LL)	V1044300
4431.	293	DO 650 KK = 1, 5	V1044310

MTS LINE NO.	INTERNAL STMT NO.	**** F I N T I C Y **** INPUT LISTING	
4432.	294	NTCLP(L,KK) = NTCLP(LL,KK)	V1044320
4433.	295	NTOS(L,KK) = NTOS(LL,KK)	V1044330
4434.	296	650 TOS(L,KK) = TOS(LL,KK)	V1044340
4435.	297	WWDIF(L) = WWDIF(LL)	V1044350
4436.	298	NTGP(L) = NTGP(LL)	V1044360
4437.	299	DO 660 KK = 1, 5	V1044370
4438.	300	660 NTGPV(L,KK) = NTGPV(LL,KK)	V1044380
4439.	301	TSMPLE(L) = TSMPLE(LL)	V1044390
4440.	302	OPTION(L) = OPTION(LL)	V1044400
4441.	303	670 CONTINUE	V1044410
4442.	304	DO 680 I = 1, 32	V1044420
4443.	305	VARIB(1,I) = 1.0	V1044430
4444.	306	680 IOP(I) = 0	V1044440
4445.	307	RETURN	V1044450
4446.		C **********	V1044460
4447.	308	ENTRY ANTLKW(IU,IS,IA,ILR)	V1044470
4448.	309	L = 8 * (IU - 1) + 4 * (IS - 1) + 2 * (IA - 1) + ILR	V1044480
4449.	310	K = IALOPT(L)	V1044490
4450.	311	IU1 = (K - 1) / 8 + 1	V1044500
4451.	312	IS1 = (K - (IU1 - 1)*8 - 1) / 4 + 1	V1044510
4452.	313	IA1 = (K - (IU1 - 1)*8 - (IS1 - 1)*4 - 1) / 2 + 1	V1044520
4453.	314	ILR1 = K - (IU1 - 1) * 8 - (IS1 - 1) * 4 - (IA1 - 1) * 2	V1044530
4454.	315	IF (IWRITE .GT. 0) GO TO 780	V1044540
4455.	316	IWRITE = 1	V1044550
4456.		C	V1044560
4457.		C ECHO ANTILOCK PARAMETERS	V1044570
4458.		C	V1044580
4459.		C DICTIONARY ECHO.	V1044590
4460.	317	WRITE (WR,1600)	V1044600
4461.	318	WRITE (WR,690)	V1044610
4462.	319	690 FORMAT (' ', T10, '**********...**********'	V1044620
4463.		1'**********...**********'	V1044630
4464.		2**', T125, '*')	V1044640
4465.	320	WRITE (WR,700)	V1044650
4466.	321	700 FORMAT (' ', T10, '*', T125, '*')	V1044660
4467.	322	WRITE (WR,750)	V1044670
4468.	323	WRITE (WR,700)	V1044680
4469.	324	WRITE (WR,760)	V1044690
4470.	325	WRITE (WR,770)	V1044700
4471.	326	DO 740 I = 1, 44	V1044710
4472.	327	J = I + 44	V1044720
4473.	328	IF (J .GT. 60) GO TO 710	V1044730
4474.	329	WRITE (WR,720) I, DES(I), J, DES(J)	V1044740
4475.	330	GO TO 740	V1044750
4476.	331	710 WRITE (WR,730) I, DES(I)	V1044760
4477.	332	720 FORMAT (' ', T10, '*', T26, I2, ' ..... ', T51,	V1044770
4478.		1 A8, T125, '*', T81, I2, ' ..... ', T106,	V1044780
4479.		2 A8)	V1044790
4480.	333	730 FORMAT (' ', T10, '*', T26, I2, ' ..... ', T51,	V1044800
4481.		1 A8, T125, '*')	V1044810
4482.	334	740 CONTINUE	V1044820
4483.	335	WRITE (WR,700)	V1044830
4484.	336	WRITE (WR,700)	V1044840
4485.	337	WRITE (WR,690)	V1044850
4486.	338	750 FORMAT (' ', T33, 'DICTIONARY OF ANTI-LOCK VARIABLES/PARAMETERS',	V1044860

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   MTS          INTERNAL      ****  F T N T I D Y ****
LINE NO.        STMT NO.      INPUT LISTING

4487.                        1       ' AVAILABLE TO USER.', T10, '*', T125, '*')                          V1044870
4488.              339     760 FORMAT (' ', T20, 'VARIABLE I.D.', T50, 'DESCRIPTION', T10, '*',           V1044880
4489.                        1       T125, '*', T75, 'VARIABLE I.D.', T105, 'DESCRIPTION', /,             V1044890
4490.                        2       ' ', T20, '-------------', T50, '-----------', T10, '*',             V1044900
4491.                        3       T125, '*', T75, '-------------', T105, '-----------')                V1044910
4492.              340     770 FORMAT (' ', T10, '*', T125, '*')                                          V1044920
4493.                      C  PARAMETER ECHO.                                                             V1044930
4494.              341       780 IF (IALOPT(L) .GE. 0) GO TO 1630                                         V1044940
4495.              342         WRITE (WR,1600)                                                            V1044950
4496.              343         ITN = TN                                                                   V1044960
4497.              344         WRITE (WR,790) ITN, IU, IS, IA, SIDE(ILR)                                  V1044970
4498.              345       790 FORMAT (T20, '*** ANTI-LOCK SUBROUTINE INPUT PARAMETER TABLE', I3,       V1044980
4499.                        1       ' --- ', 'UNIT', I2, 2X, 'SUSPENSION', I2, 2X, 'AXLE', I2,           V1044990
4500.                        2       A8, 'SIDE', '  ***')                                                V1045000
4501.              346         WRITE (WR,800)                                                             V1045010
4502.              347       800 FORMAT ('0', T55, 'FIRST', T67, 'SECOND', T81, 'INITIAL', T91,           V1045020
4503.                        1       'FIRST', T101, 'SECOND')                                             V1045030
4504.              348         WRITE (WR,810)                                                             V1045040
4505.              349       810 FORMAT (' ', T43, 'INITIAL', T55, 'ADAPTIVE', T67, 'ADAPTIVE',           V1045050
4506.                        1       T81, 'VALUE', T91, 'ADAPTIVE', T101, 'ADAPTIVE', T112,               V1045060
4507.                        2       'FIRST', T122, 'SECOND')                                             V1045070
4508.              350         WRITE (WR,820)                                                             V1045080
4509.              351       820 FORMAT (' ', T3, 'SYMBOL', T20, 'DESCRIPTION', T43, 'VALUE', T55,        V1045090
4510.                        1       'VALUE', T67, 'VALUE', T81, 'VARIABLE', T91, 'VARIABLE',             V1045100
4511.                        2       T101, 'VARIABLE', T112, 'BREAK-PT', T122, 'BREAK-PT')                V1045110
4512.              352         WRITE (WR,830)                                                             V1045120
4513.              353       830 FORMAT (' ', T3, '------', T20, '-----------', T43, '-------',           V1045130
4514.                        1       T55, '--------', T67, '--------', T81, '--------', T91,              V1045140
4515.                        2       '--------', T101, '--------', T112, '--------', T122,                V1045150
4516.                        3       '--------')                                                          V1045160
4517.              354         IDUM = NDEF(L)                                                             V1045170
4518.              355         DO 880 I = 1, IDUM                                                         V1045180
4519.              356           WRITE (WR,840)                                                           V1045190
4520.              357       840   FORMAT (' ')                                                           V1045200
4521.              358           NN = NTF(I,L)                                                            V1045210
4522.              359           NEW = 1                                                                  V1045220
4523.              360           DO 870 J = 1, NN                                                         V1045230
4524.              361             DO 850 K = 1, 5                                                        V1045240
4525.              362       850     BUF(K) = COEF(I,J,K,L)                                               V1045250
4526.              363             DO 860 K = 1, 4                                                        V1045260
4527.              364       860     IBF(K) = RIC(I,J,K,L) + SIGN(.1,RIC(I,J,K,L))                        V1045270
4528.              365             CALL PRINT(BUF, IBF, I, J, NEW)                                        V1045280
4529.              366       870   CONTINUE                                                               V1045290
4530.              367       880 CONTINUE                                                                 V1045300
4531.              368         NP = 4 + NCN(L)                                                            V1045310
4532.              369         DO 920 I = 5, NP                                                           V1045320
4533.              370           WRITE (WR,840)                                                           V1045330
4534.              371           NN = NTN(I - 4,L)                                                        V1045340
4535.              372           NEW = 1                                                                  V1045350
4536.              373           DO 910 J = 1, NN                                                         V1045360
4537.              374             DO 890 K = 1, 5                                                        V1045370
4538.              375       890     BUF(K) = COEF(I,J,K,L)                                               V1045380
4539.              376             DO 900 K = 1, 4                                                        V1045390
4540.              377       900     IBF(K) = RIC(I,J,K,L) + SIGN(.1,RIC(I,J,K,L))                        V1045400
4541.              378             CALL PRINT(BUF, IBF, I, J, NEW)                                        V1045410
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MTS LINE NO.	INTERNAL STMT NO.	**** P R I N T E D Y **** INPUT LISTING	
4542.	379	910 CONTINUE	V1045420
4543.	380	920 CONTINUE	V1045430
4544.	381	IF (IPKEY(L) .NE. 0 .AND. IPKEY(L) .NE. 2) GO TO 990	V1045440
4545.	382	NEW = 1	V1045450
4546.	383	IDUM = NT1(L)	V1045460
4547.	384	DO 950 J = 1, IDUM	V1045470
4548.	385	DO 930 K = 1, 5	V1045480
4549.	386	930 BUF(K) = FF(J,K,L)	V1045490
4550.	387	DO 940 K = 1, 4	V1045500
4551.	388	940 IBF(K) = RIDF(J,K,L) + SIGN(.1,RIDF(J,K,L))	V1045510
4552.	389	I = 9	V1045520
4553.	390	CALL PRINT(BUF, IBF, I, J, NEW)	V1045530
4554.	391	950 CONTINUE	V1045540
4555.	392	NEW = 1	V1045550
4556.	393	IDUM = NT2(L)	V1045560
4557.	394	DO 980 J = 1, IDUM	V1045570
4558.	395	DO 960 K = 1, 5	V1045580
4559.	396	960 BUF(K) = GG(J,K,L)	V1045590
4560.	397	DO 970 K = 1, 4	V1045600
4561.	398	970 IBF(K) = RIDG(J,K,L) + SIGN(.1,RIDG(J,K,L))	V1045610
4562.	399	I = 10	V1045620
4563.	400	CALL PRINT(BUF, IBF, I, J, NEW)	V1045630
4564.	401	980 CONTINUE	V1045640
4565.	402	990 IF (IPKEY(L) .NE. 1 .AND. IPKEY(L) .NE. 2) GO TO 1060	V1045650
4566.	403	NEW = 1	V1045660
4567.	404	IDUM = NT3(L)	V1045670
4568.	405	DO 1020 J = 1, IDUM	V1045680
4569.	406	DO 1000 K = 1, 5	V1045690
4570.	407	1000 BUF(K) = RR(J,K,L)	V1045700
4571.	408	DO 1010 K = 1, 4	V1045710
4572.	409	1010 IBF(K) = RIDR(J,K,L) + SIGN(.1,RIDR(J,K,L))	V1045720
4573.	410	I = 11	V1045730
4574.	411	CALL PRINT(BUF, IBF, I, J, NEW)	V1045740
4575.	412	1020 CONTINUE	V1045750
4576.	413	NEW = 1	V1045760
4577.	414	IDUM = NT4(L)	V1045770
4578.	415	DO 1050 J = 1, IDUM	V1045780
4579.	416	DO 1030 K = 1, 5	V1045790
4580.	417	1030 BUF(K) = SS(J,K,L)	V1045800
4581.	418	DO 1040 K = 1, 4	V1045810
4582.	419	1040 IBF(K) = RIDS(J,K,L) + SIGN(.1,RIDS(J,K,L))	V1045820
4583.	420	I = 12	V1045830
4584.	421	CALL PRINT(BUF, IBF, I, J, NEW)	V1045840
4585.	422	1050 CONTINUE	V1045850
4586.	423	1060 IF (IPDKEY(L) .LE. -1) GO TO 1130	V1045860
4587.	424	NEW = 1	V1045870
4588.	425	IDUM = NTPDR(L)	V1045880
4589.	426	DO 1090 J = 1, IDUM	V1045890
4590.	427	DO 1070 K = 1, 5	V1045900
4591.	428	1070 BUF(K) = WW(J,K,L)	V1045910
4592.	429	DO 1080 K = 1, 4	V1045920
4593.	430	1080 IBF(K) = WID(J,K,L) + SIGN(.1,WID(J,K,L))	V1045930
4594.	431	I = 13	V1045940
4595.	432	CALL PRINT(BUF, IBF, I, J, NEW)	V1045950
4596.	433	1090 CONTINUE	V1045960

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   MTS          INTERMAT      ****  F T N T I D Y ****
LINE NO.        STMT NO.      INPUT LISTING

4597.             434           NEW = 1                                                    V1045970
4598.             435           IDUM = NTPDE(L)                                            V1045980
4599.             436           DO 1120 J = 1, IDUM                                        V1045990
4600.             437             DO 1100 K = 1, 5                                         V1046000
4601.             438   1100      BLE(K) = VV(J,K,L)                                       V1046010
4602.             439             DO 1110 K = 1, 4                                         V1046020
4603.             440   1110      IBE(K) = VID(J,K,L) + SIGN(.1,VID(J,K,L))                V1046030
4604.             441             I = 14                                                   V1046040
4605.             442             CALL PRINT(BLE, IBE, I, J, NEW)                          V1046050
4606.             443   1120  CONTINUE                                                     V1046060
4607.             444   1130  IF (IPWMKY(L) .LE. - 1) GO TO 1220                         V1046070
4608.             445           NEW = 1                                                    V1046080
4609.             446           IDUM = NTPWM(L)                                            V1046090
4610.             447           DO 1160 J = 1, IDUM                                        V1046100
4611.             448             DO 1140 K = 1, 5                                         V1046110
4612.             449   1140      BLE(K) = PW(J,K,L)                                       V1046120
4613.             450             DO 1150 K = 1, 4                                         V1046130
4614.             451   1150      IBE(K) = RIDPW(J,K,L) + SIGN(.1,RIDPW(J,K,L))            V1046140
4615.             452             I = 15                                                   V1046150
4616.             453             CALL PRINT(BLE, IBE, I, J, NEW)                          V1046160
4617.             454   1160  CONTINUE                                                     V1046170
4618.             455           J = 1                                                      V1046180
4619.             456           WRITE (WR,840)                                             V1046190
4620.             457           DO 1210 K = 1, 5                                           V1046200
4621.             458             WRITE (WR,1200) K, FZ(K,J,L)                             V1046210
4622.             459             IBE(1) = ZID(1,L) + SIGN(.1,ZID(1,L))                    V1046220
4623.             460             IBE(2) = ZID(2,L) + SIGN(.1,ZID(2,L))                    V1046230
4624.             461             IF (K .GT. 1) GO TO 1180                                 V1046240
4625.             462             IF (ABS(RMORE(L)) .GT. .001) WRITE (WR,1190) FZ(K,2,L),  V1046250
4626.                            1  FZ(K,3,L), IBE(1), IBE(2), ZBR(1,L), ZBR(2,L)         V1046260
4627.             463             IF (RMORE(L) .GT. .001) WRITE (WR,1170)                  V1046270
4628.             464   1170      FORMAT ('+', T98, 'AND')                                 V1046280
4629.             465             GO TO 1210                                               V1046290
4630.             466   1180      IF (ABS(RMORE(L)) .GT. .001) WRITE (WR,1190) FZ(K,2,L),  V1046300
4631.                            1  FZ(K,3,L)                                              V1046310
4632.             467   1190      FORMAT ('+', T54, F10.4, T66, F10.4, T93, I3, T103, I3, T112,  V1046320
4633.                            1         F8.4, T122, F8.4)                               V1046330
4634.             468   1200      FORMAT (' ', T3, 'FZ', I1, T15, 'PULSE-WIDTH TABLE INPUT', T42,  V1046340
4635.                            1         F10.4)                                          V1046350
4636.             469   1210  CONTINUE                                                     V1046360
4637.             470   1220  IF (IDSKEY(L) .LE. - 1) GO TO 1310                         V1046370
4638.             471           DO 1290 KK = 1, 5                                          V1046380
4639.             472             NEW = 1                                                  V1046390
4640.             473             IDUM = NIDS(L,KK)                                        V1046400
4641.             474             IF (IDUM .LE. 0) GO TO 1290                              V1046410
4642.             475             DO 1250 J = 1, IDUM                                      V1046420
4643.             476               DO 1230 K = 1, 5                                       V1046430
4644.             477   1230        BLE(K) = WDS(J,K,L,KK)                                 V1046440
4645.             478               DO 1240 K = 1, 4                                       V1046450
4646.             479   1240        IBE(K) = RIDDS(J,K,L,KK) + SIGN(.1,RIDDS(J,K,L,KK))  V1046460
4647.             480               I = 15 + KK                                            V1046470
4648.             481               CALL PRINT(BLE, IBE, I, J, NEW)                        V1046480
4649.             482   1250      CONTINUE                                                 V1046490
4650.             483             WRITE (WR,1300)                                          V1046500
4651.             484             IDUM = NTCLR(L,KK)                                       V1046510
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   MTS          INTERNAL       **** F T N T I D Y ****
LINE NO.        STMT NO.       INPUT LISTING

4652.             485            IF (IDUM .LE. 0) GO TO 1290                                    V1046520
4653.             486            DO 1280 J = 1, IDUM                                            V1046530
4654.             487              DO 1260 K = 1, 5                                             V1046540
4655.             488      1260      BUF(K) = WCLR(J,K,L,KK)                                    V1046550
4656.             489              DO 1270 K = 1, 4                                             V1046560
4657.             490      1270      IBF(K) = RIDCLR(J,K,L,KK)                                  V1046570
4658.             491              CALL PRINT(BUF, IBF, I, J, NEW)                              V1046580
4659.             492      1280    CONTINUE                                                     V1046590
4660.             493      1290 CONTINUE                                                        V1046600
4661.             494      1300 FORMAT ('0')                                                    V1046610
4662.             495      1310 IF (IGPKEY(L) .LE. - 1) GO TO 1350                              V1046620
4663.             496           NEW = 1                                                         V1046630
4664.             497           IDUM = NTGP(L)                                                  V1046640
4665.             498           IF (IDUM .LE. 0) GO TO 1350                                     V1046650
4666.             499           DO 1340 J = 1, IDUM                                             V1046660
4667.             500             DO 1320 K = 1, 5                                              V1046670
4668.             501      1320     BUF(K) = GP(J,K,L)                                         V1046680
4669.             502             DO 1330 K = 1, 4                                              V1046690
4670.             503      1330     IBF(K) = RIDGP(J,K,L) + SIGN(.1,RIDGP(J,K,L))              V1046700
4671.             504             I = 21                                                        V1046710
4672.             505             CALL PRINT(BUF, IBF, I, J, NEW)                               V1046720
4673.             506      1340 CONTINUE                                                        V1046730
4674.             507      1350 IF (IGPVKY(L) .LE. - 1) GO TO 1400                              V1046740
4675.             508           DO 1390 KK = 1, 5                                               V1046750
4676.             509             NEW = 1                                                       V1046760
4677.             510             IDUM = NTGPV(L,KK)                                            V1046770
4678.             511             IF (IDUM .LE. 0) GO TO 1390                                   V1046780
4679.             512             DO 1380 J = 1, IDUM                                           V1046790
4680.             513               DO 1360 K = 1, 5                                            V1046800
4681.             514      1360       BUF(K) = GPVV(J,K,L,KK)                                  V1046810
4682.             515               DO 1370 K = 1, 4                                            V1046820
4683.             516      1370       IBF(K) = RIDGPV(J,K,L,KK)                                V1046830
4684.             517               I = 21 + KK                                                 V1046840
4685.             518               CALL PRINT(BUF, IBF, I, J, NEW)                             V1046850
4686.             519      1380     CONTINUE                                                   V1046860
4687.             520      1390 CONTINUE                                                        V1046870
4688.             521      1400 WRITE (WR,1410)                                                 V1046880
4689.             522      1410 FORMAT ('-', '** NON-ADAPTIVE ANTI-LOCK PARAMETERS. **')        V1046890
4690.             523           WRITE (WR,1420) TAU1(L), TAU2(L), TAU3(L), TAU4(L)              V1046900
4691.             524      1420 FORMAT ('0', T3, 'TAU1', T20, 'LOGIC TIME DELAY', T42, F10.4, /,  V1046910
4692.                         1       ' ', T3, 'TAU2', T26, '"', T42, F10.4, /, ' ', T3, 'TAU3',  V1046920
4693.                         2       T26, '"', T42, F10.4, /, ' ', T3, 'TAU4', T26, '"', T42,   V1046930
4694.                         3       F10.4)                                                     V1046940
4695.             525           IF (IPKEY(L) .NE. 0 .AND. IPKEY(L) .NE. 2) GO TO 1450          V1046950
4696.             526           WRITE (WR,1430) ALX1(L), ALX2(L), ALX3(L), ALX4(L)             V1046960
4697.             527           WRITE (WR,1440) PRE1(L), PRE2(L), PRE3(L), PRE1(L), PRE2(L),   V1046970
4698.                         1PRE3(L)                                                           V1046980
4699.             528      1430 FORMAT (' ', T3, 'X1', T20, 'EPSILON 1 BREAK-PT', T42, F10.4, /,  V1046990
4700.                         1       ' ', T3, 'X2', T26, '"', T42, F10.4, /, ' ', T3, 'X3', T20,V1047000
4701.                         2       'EPSILON 2 BREAK-PT', T42, F10.4, /, ' ', T3, 'X4', T26,   V1047010
4702.                         3       '"', T42, F10.4)                                           V1047020
4703.             529      1440 FORMAT (' ', T3, 'PRE1', T15, 'EXP. PRESSURE FALL RATE', T42,     V1047030
4704.                         1       F10.4, /, ' ', T3, 'PRE2', T26, '"', T42, F10.4, /, ' ',   V1047040
4705.                         2       T3, 'PRE3', T26, '"', T42, F10.4, /, ' ', T3, 'PRE1', T15, V1047050
4706.                         3       'EXP. PRESSURE RISE RATE', T42, F10.4, /, ' ', T3, 'PRE2', V1047060
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   MTS          INTERNAL      **** F T N T I C Y ****
LINE NO.        STMT NO.      INPUT LISTING

4707.                            4       T26, '"', T42, F10.4, /, ' ', T3, 'PRE3', T26, '"', T42,    V1047070
4708.                            5       F10.4)                                                      V1047080
4709.           530          1450 IF (IPKEY(L) .NE. 1 .AND. IPKEY(L) .NE. 2) GO TO 1480               V1047090
4710.           531               WRITE (WP,1460) ALX5(L), ALX6(L), ALX7(L), ALX8(L)                  V1047100
4711.           532               WRITE (WP,1470) PEL1(L), PEL2(L), PEL3(L), PRL1(L), PRL2(L),        V1047110
4712.                            1PRL3(L)                                                            V1047120
4713.           533          1460 FORMAT (' ', T3, 'X5', T20, 'EPSILON 3 BREAK-PT', T42, F10.4, /,    V1047130
4714.                            1       ' ', T3, 'X6', T26, '"', T42, F10.4, /, ' ', T3, 'X7', T20,V1047140
4715.                            2       'EPSILON 4 BREAK-PT', T42, F10.4, /, ' ', T3, 'X8', T26,    V1047150
4716.                            3       '"', T42, F10.4)                                            V1047160
4717.           534          1470 FORMAT (' ', T3, 'PEL1', T15, 'LIN. PRESSURE FALL RATE', T42,       V1047170
4718.                            1       F10.4, /, ' ', T3, 'PEL2', T26, '"', T42, F10.4, /, ' ',    V1047180
4719.                            2       T3, 'PEL3', T26, '"', T42, F10.4, /, ' ', T3, 'PRL1', T15,  V1047190
4720.                            3       'LIN. PRESSURE RISE RATE', T42, F10.4, /, ' ', T3, 'PRL2',  V1047200
4721.                            4       T26, '"', T42, F10.4, /, ' ', T3, 'PRL3', T26, '"', T42,    V1047210
4722.                            5       F10.4)                                                      V1047220
4723.           535          1480 WRITE (WP,1490) TAUON(L), TAUOFF(L)                                 V1047230
4724.           536          1490 FORMAT (' ', T3, 'TAUON', T15, 'PRESSURE-ON TIME DELAY', T42,       V1047240
4725.                            1       F10.4, /, ' ', T3, 'TAUOFF', T15, 'PRESSURE-OFF TIME DELAY'V1047250
4726.                            2       , T42, F10.4)                                               V1047260
4727.           537               WRITE (WP,1500) TAUW(L), TAUWD(L)                                   V1047270
4728.           538          1500 FORMAT (' ', T3, 'TAUW', T15, 'TIME CONSTANT-WHEEL RATE', T42,      V1047280
4729.                            1       F10.4, /, ' ', T3, 'TAUWD', T15, 'TIME CONSTANT-WHEEL ACCELV1047290
4730.                            2.', T42, F10.4)                                                    V1047300
4731.           539               WRITE (WP,1510) IOP12(L), IOP23(L), IOP34(L)                        V1047310
4732.           540               WRITE (WP,1520) IOP56(L), IOP67(L), IOP78(L)                        V1047320
4733.           541          1510 FORMAT (' ', T3, 'OP12', T15, 'LOGICAL OPERATOR SWITCH', T51, I1,   V1047330
4734.                            1       /, ' ', T3, 'OP23', T26, '"', T51, I1, /, ' ', T3, 'OP34',  V1047340
4735.                            2       T26, '"', T51, I1)                                          V1047350
4736.           542          1520 FORMAT (' ', T3, 'OP56', T15, 'LOGICAL OPERATOR SWITCH', T51, I1,   V1047360
4737.                            1       /, ' ', T3, 'OP67', T26, '"', T51, I1, /, ' ', T3, 'OP78',  V1047370
4738.                            2       T26, '"', T51, I1)                                          V1047380
4739.           543               IF (IPWMKY(L) .LE. - 1) GO TO 1550                                  V1047390
4740.           544               WRITE (WP,1530) PERIOD(L)                                           V1047400
4741.           545          1530 FORMAT (' ', T3, 'PERIOD', T15, 'PULSE-WIDTH MOD. PERIOD', T42,     V1047410
4742.                            1       F10.4)                                                      V1047420
4743.           546               WRITE (WP,1540) Z1(L), Z2(L), Z3(L), Z4(L), Z5(L)                   V1047430
4744.           547          1540 FORMAT (' ', T3, 'Z1', T15, 'PULSE-WIDTH BREAK-PT', T42, F10.4, /,  V1047440
4745.                            1       ' ', T3, 'Z2', T26, '"', T42, F10.4, /, ' ', T3, 'Z3', T26, V1047450
4746.                            2       '"', T42, F10.4, /, ' ', T3, 'Z4', T26, '"', T42, F10.4, /, V1047460
4747.                            3       ' ', T3, 'Z5', T26, '"', T42, F10.4)                        V1047470
4748.           548          1550 IF (IDSKEY(L) .LE. - 1) GO TO 1580                                  V1047480
4749.           549               DO 1570 KK = 1, 5                                                   V1047490
4750.           550                  IF (NTOS(L,KK) .LE. 0) GO TO 1570                                V1047500
4751.           551                  IJ = KK                                                          V1047510
4752.           552                  WRITE (WP,1560) IJ, TOS(L,KK)                                    V1047520
4753.           553          1560    FORMAT (' ', T3, 'TOS', I1, T15, 'ONE-SHOT TIME DURATION', T42,  V1047530
4754.                            1       F10.4)                                                      V1047540
4755.           554          1570 CONTINUE                                                            V1047550
4756.           555          1580 WRITE (WP,1590) TSMPLE(L)                                           V1047560
4757.           556          1590 FORMAT (' ', T3, 'TSAMPLE', T15, 'ANTI-LOCK SAMPLING RATE', T42,    V1047570
4758.                            1       F10.4)                                                      V1047580
4759.           557          1600 FORMAT ('1')                                                        V1047590
4760.           558               WRITE (WP,1620) OPTION(L)                                           V1047600
4761.           559               WRITE (WP,1610) WHDIF(L)                                            V1047610
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   MTS          INTERNAL       ****  F T N T I D Y ****
 LINE NO.       STMT NO.       INPUT LISTING

 4762.            560      1610 FORMAT (' ', T3, 'OMEGDIF', T15, 'SIDE-TO-SIDE TOLERANCE', T42,    V1047620
 4763.                     1       F10.4)                                                          V1047630
 4764.            561      1620 FORMAT (' ', T3, 'OPTION', T15, 'SIDE-TO-SIDE', T51, I1)           V1047640
 4765.            562      1630 CONTINUE                                                           V1047650
 4766.            563           IF (IALOPT(L) .EQ. 0) WRITE (WR,1640) IU, IS, IA, SIDE(ILR)        V1047660
 4767.            564           IF (IALOPT(L) .GT. 0) WRITE (WR,1650) IU, IS, IA, SIDE(ILR), IUI, V1047670
 4768.                        1IS1, IA1, SIDE(ILR1)                                               V1047680
 4769.            565      1640 FORMAT ('0', '*** UNIT', I2, 2X, 'SUSPENSION', I2, 2X, 'AXLE', I2,V1047690
 4770.                     1       A8, 'SIDE', ' WILL HAVE NO ANTIL-LOCK SYSTEM')                  V1047700
 4771.            566      1650 FORMAT ('0', '*** UNIT', I2, 2X, 'SUSPENSION', I2, 2X, 'AXLE', I2,V1047710
 4772.                        1       A8, 'SIDE', ' WILL HAVE THE SAME ANTI-LOCK SYSTEM ', 'AS', V1047720
 4773.                        2       /, ' ', T5, ' UNIT', I2, 2X, 'SUSPENSION', I2, 2X, 'AXLE', V1047730
 4774.                        3       I2, A9, 'SIDE')                                             V1047740
 4775.            567           RETURN                                                           V1047750
 4776.                     C ***************************************************************** V1047760
 4777.            568           ENTRY ANTILK(WLR,WRR,WV,WVD,PP,PD,PRET,IJK,T)                    V1047770
 4778.            569           L = IJK                                                          V1047780
 4779.            570           M = IJK                                                          V1047790
 4780.            571           PD(IJK) = PP                                                     V1047800
 4781.            572           P = PP                                                           V1047810
 4782.            573           IF (IRETRN .EQ. 0 .OR. T .GT. TLSTI(L)) GO TO 1660               V1047820
 4783.            574           PRET = VARIB(35,L)                                               V1047830
 4784.            575           RETURN                                                           V1047840
 4785.                     C  SIDE-TO-SIDE OPTION.                                              V1047850
 4786.            576      1660 NGO = OPTION(L)                                                  V1047860
 4787.            577           VARIB(60,L) = 0.                                                 V1047870
 4788.            578           IF (ABS(WLR - WRR) .GT. WWDIF(L)) VARIB(60,L) = 1.0              V1047880
 4789.            579           GO TO (1670, 1680, 1690, 1700), NGO                              V1047890
 4790.            580      1670 W = WRR                                                          V1047900
 4791.            581           IF (WLR .LE. WRR) W = WLR                                        V1047910
 4792.            582           GO TO 1710                                                       V1047920
 4793.            583      1680 W = WRR                                                          V1047930
 4794.            584           IF (WLR .GE. WRR) W = WLR                                        V1047940
 4795.            585           GO TO 1710                                                       V1047950
 4796.            586      1690 W = (WLR + WRR) * .50                                            V1047960
 4797.            587           GO TO 1710                                                       V1047970
 4798.            588      1700 NNN = IJK / 2                                                    V1047980
 4799.            589           MMM = (IJK - 1) / 2                                              V1047990
 4800.            590           W = WRR                                                          V1048000
 4801.            591           IF (NNN .EQ. MMM) W = WLR                                        V1048010
 4802.            592      1710 CONTINUE                                                         V1048020
 4803.                     C  IRETRN SHOULD BE ZERO FOR FIRST CALL, NON-ZERO FOR SUCCESSIVE CALLS. V1048030
 4804.            593           IF (IRETRN) 1750, 1720, 1750                                     V1048040
 4805.            594      1720 DO 1740 I = 1, 32                                                V1048050
 4806.            595             CNI(I) = 0                                                    V1048060
 4807.            596             CEFI(I) = 0                                                   V1048070
 4808.            597             CPI(I) = 0                                                    V1048080
 4809.            598             ICP(I) = 0                                                    V1048090
 4810.            599             CNTI(I) = 0                                                   V1048100
 4811.            600             CEFTI(I) = 0                                                  V1048110
 4812.            601             IXLSTI(I) = 0                                                 V1048120
 4813.            602             IYISTI(I) = 0                                                 V1048130
 4814.            603             ICNT(I) = 0                                                   V1048140
 4815.            604             ICEFT(I) = 0                                                  V1048150
 4816.            605             CNET(I) = 1                                                   V1048160
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MTS LINE NO.	INTERNAL STMT NO.	**** F I N T I D Y **** INPUT LISTING	
4817.	606	TISTI(I) = T	V1048170
4818.	607	WALSTI(I) = W	V1048180
4819.	608	WOLSTI(I) = 0.	V1048190
4820.	609	T1I(I) = T	V1048200
4821.	610	T2I(I) = T	V1048210
4822.	611	T3I(I) = T	V1048220
4823.	612	T4I(I) = T	V1048230
4824.	613	IUP(I) = 0	V1048240
4825.	614	IDOWN(I) = 1	V1048250
4826.	615	DO 1730 KK = 1, 5	V1048260
4827.	616	INEW(I,KK) = 1	V1048270
4828.	617	1730 INEW(I,KK) = -100.	V1048280
4829.	618	TSMPC(I) = 0.	V1048290
4830.	619	VARIB(2,I) = T	V1048300
4831.	620	VARIB(3,I) = W	V1048310
4832.	621	VARIB(4,I) = 0.	V1048320
4833.	622	VARIB(5,I) = WV	V1048330
4834.	623	VARIB(6,I) = WVD	V1048340
4835.	624	VARIB(7,I) = 100.	V1048350
4836.	625	VARIB(8,I) = 100.	V1048360
4837.	626	VARIB(9,I) = 1.	V1048370
4838.	627	VARIB(10,I) = 1.	V1048380
4839.	628	VARIB(11,I) = T	V1048390
4840.	629	VARIB(12,I) = T	V1048400
4841.	630	VARIB(13,I) = WV	V1048410
4842.	631	VARIB(14,I) = WV	V1048420
4843.	632	VARIB(15,I) = W	V1048430
4844.	633	VARIB(16,I) = W	V1048440
4845.	634	VARIB(17,I) = 0.	V1048450
4846.	635	VARIB(18,I) = C.	V1048460
4847.	636	VARIB(19,I) = 0.	V1048470
4848.	637	VARIB(20,I) = 0.	V1048480
4849.	638	VARIB(21,I) = T	V1048490
4850.	639	VARIB(22,I) = T	V1048500
4851.	640	VARIB(23,I) = C.	V1048510
4852.	641	VARIB(24,I) = T	V1048520
4853.	642	VARIB(25,I) = 0.	V1048530
4854.	643	VARIB(26,I) = 0.	V1048540
4855.	644	VARIB(27,I) = 100.	V1048550
4856.	645	VARIB(28,I) = 100.	V1048560
4857.	646	VARIB(29,I) = 1.	V1048570
4858.	647	VARIB(30,I) = 1.	V1048580
4859.	648	VARIB(31,I) = PD	V1048590
4860.	649	VARIB(32,I) = C.	V1048600
4861.	650	VARIB(33,I) = 0.	V1048610
4862.	651	VARIB(34,I) = C.	V1048620
4863.	652	VARIB(35,I) = P	V1048630
4864.	653	VARIB(36,I) = 0.	V1048640
4865.	654	VARIB(37,I) = 0.	V1048650
4866.	655	VARIB(38,I) = C.	V1048660
4867.	656	VARIB(39,I) = T	V1048670
4868.	657	VARIB(40,I) = T	V1048680
4869.	658	VARIB(41,I) = 0.	V1048690
4870.	659	VARIB(42,I) = 0.	V1048700
4871.	660	VARIB(43,I) = 0.	V1048710

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   MTS          INTERNAL      **** P R I N T O U T ****
 LINE NO.       STMT NO.      INPUT LISTING

 4872.            661           VARIB(44,I) = 0.                                                          V1048720
 4873.            662           VARIB(45,I) = W                                                           V1048730
 4874.            663           VARIB(46,I) = W                                                           V1048740
 4875.            664           VARIB(47,I) = 0.                                                          V1048750
 4876.            665           VARIB(48,I) = 0.                                                          V1048760
 4877.            666           VARIB(49,I) = W                                                           V1048770
 4878.            667           VARIB(50,I) = 0.                                                          V1048780
 4879.            668           VARIB(51,I) = 0.                                                          V1048790
 4880.            669           VARIB(52,I) = 0.                                                          V1048800
 4881.            670           VARIB(53,I) = 0.                                                          V1048810
 4882.            671           VARIB(54,I) = 0.                                                          V1048820
 4883.            672           VARIB(55,I) = 0.                                                          V1048830
 4884.            673           VARIB(56,I) = 0.                                                          V1048840
 4885.            674           VARIB(57,I) = 0.                                                          V1048850
 4886.            675           VARIB(58,I) = 0.                                                          V1048860
 4887.            676           VARIB(59,I) = 0.                                                          V1048870
 4888.            677           VARIB(60,I) = 0.                                                          V1048880
 4889.            678           CNT(L) = 0.                                                               V1048890
 4890.            679           IF (ABS(TAUW(I)) .LT. .0001) TAUW(I) = .0001                              V1048900
 4891.            680           IF (ABS(TAUWD(I)) .LT. .0001) TAUWD(I) = .0001                            V1048910
 4892.            681           ALW1(I) = 1. / TAUW(I)                                                    V1048920
 4893.            682           ALW2(I) = 1. / TAUWD(I)                                                   V1048930
 4894.            683      174C CONTINUE                                                                  V1048940
 4895.            684           CN = 0                                                                    V1048950
 4896.            685           PRET = 0.                                                                 V1048960
 4897.            686           OFF = 0                                                                   V1048970
 4898.            687           OP = 0                                                                    V1048980
 4899.            688           CNT = 0                                                                   V1048990
 4900.            689           OFFT = 0                                                                  V1049000
 4901.            690           OPCNT = 0.                                                                V1049010
 4902.            691           IXLAST = 0                                                                V1049020
 4903.            692           IYLAST = 0                                                                V1049030
 4904.            693           ION = 0                                                                   V1049040
 4905.            694           IOFF = 0                                                                  V1049050
 4906.            695           ONE = 1                                                                   V1049060
 4907.            696           TLAST = T                                                                 V1049070
 4908.            697           WALLST = W                                                                V1049080
 4909.            698           WODLST = 0.                                                               V1049090
 4910.            699           WAL = W                                                                   V1049100
 4911.            700           WOD = 0.                                                                  V1049110
 4912.            701           WL = W                                                                    V1049120
 4913.            702           TL = T                                                                    V1049130
 4914.            703           T2 = T                                                                    V1049140
 4915.            704           T3 = T                                                                    V1049150
 4916.            705           T4 = T                                                                    V1049160
 4917.            706           TC = T                                                                    V1049170
 4918.            707           DT = 0.                                                                   V1049180
 4919.            708           IRETRN = 1                                                                V1049190
 4920.            709      175C CN = ONT(M)                                                               V1049200
 4921.            710           OFF = OFFT(M)                                                             V1049210
 4922.            711           CNT = CNTT(M)                                                             V1049220
 4923.            712           OFFT = OFFTT(M)                                                           V1049230
 4924.            713           OP = OPT(M)                                                               V1049240
 4925.            714           IXLAST = IXLSTT(M)                                                        V1049250
 4926.            715           IYLAST = IYLSTT(M)                                                        V1049260
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MTS LINE NO.	INTERNAL STMT NO.	**** F T N T I D Y **** INPUT LISTING	
4927.	716	ICN = IONI(M)	V1049270
4928.	717	ICFF = IOFFI(M)	V1049280
4929.	718	CNF = CNFI(M)	V1049290
4930.	719	WDDLST = WDLSTI(M)	V1049300
4931.	720	WALIST = WALSTI(M)	V1049310
4932.	721	TLAST = TLSTI(M)	V1049320
4933.	722	T1 = T1I(M)	V1049330
4934.	723	T2 = T2I(M)	V1049340
4935.	724	T3 = T3I(M)	V1049350
4936.	725	T4 = T4I(M)	V1049360
4937.	726	TC = TCI(M)	V1049370
4938.	727	QLC1 = LC(1,M) .GT. 0	V1049380
4939.	728	QLC2 = LC(2,M) .GT. 0	V1049390
4940.	729	QLC3 = LC(3,M) .GT. 0	V1049400
4941.	730	QLC4 = LC(4,M) .GT. 0	V1049410
4942.	731	QLC5 = LC(5,M) .GT. 0	V1049420
4943.	732	QLC6 = LC(6,M) .GT. 0	V1049430
4944.	733	QLC7 = LC(7,M) .GT. 0	V1049440
4945.	734	QLC8 = LC(8,M) .GT. 0	V1049450
4946.	735	POFF1 = VARIB(7,M)	V1049460
4947.	736	POFF2 = VARIB(8,M)	V1049470
4948.	737	PON1 = VARIB(9,M)	V1049480
4949.	738	PON2 = VARIB(10,M)	V1049490
4950.	739	TOFF1 = VARIB(11,M)	V1049500
4951.	740	TON1 = VARIB(12,M)	V1049510
4952.	741	XDOFF = VARIB(13,M)	V1049520
4953.	742	XDON = VARIB(14,M)	V1049530
4954.	743	WOFF = VARIB(15,M)	V1049540
4955.	744	WON = VARIB(16,M)	V1049550
4956.	745	WDOFF = VARIB(17,M)	V1049560
4957.	746	WDON = VARIB(18,M)	V1049570
4958.	747	WDMAX = VARIB(19,M)	V1049580
4959.	748	WDMIN = VARIB(20,M)	V1049590
4960.	749	TPMAX1 = VARIB(21,M)	V1049600
4961.	750	TPMIN1 = VARIB(22,M)	V1049610
4962.	751	WLOCK = VARIB(23,M)	V1049620
4963.	752	TLOCK = VARIB(24,M)	V1049630
4964.	753	SLON = VARIB(25,M)	V1049640
4965.	754	SLOFF = VARIB(26,M)	V1049650
4966.	755	PMAX1 = VARIB(27,M)	V1049660
4967.	756	PMAX2 = VARIB(28,M)	V1049670
4968.	757	PMIN1 = VARIB(29,M)	V1049680
4969.	758	PMIN2 = VARIB(30,M)	V1049690
4970.	759	CN = VARIB(32,M) + .1	V1049700
4971.	760	SLIP = VARIB(34,M)	V1049710
4972.	761	CYCNT = VARIB(36,M)	V1049720
4973.	762	TOFF2 = VARIB(39,M)	V1049730
4974.	763	TON2 = VARIB(40,M)	V1049740
4975.	764	FOS(1) = VARIB(41,M)	V1049750
4976.	765	FOS(2) = VARIB(42,M)	V1049760
4977.	766	FOS(3) = VARIB(43,M)	V1049770
4978.	767	GPCNT = VARIB(44,M)	V1049780
4979.	768	WMAX1 = VARIB(45,M)	V1049790
4980.	769	WMAX2 = VARIB(46,M)	V1049800
4981.	770	TWMAX1 = VARIB(47,M)	V1049810

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   MTS          INTERNAL       **** F T N T I D Y ****
 LINE NO.       STMT NO.       INPUT LISTING

 4982.            771            TWMAX2 = VARIB(48,M)                                                    V1049820
 4983.            772            WMIN = VARIB(49,M)                                                      V1049830
 4984.            773            TWMIN = VARIB(50,M)                                                     V1049840
 4985.            774            TPMAX2 = VARIB(51,M)                                                    V1049850
 4986.            775            TPMIN2 = VARIB(52,M)                                                    V1049860
 4987.            776            GPV(1) = VARIB(53,M)                                                    V1049870
 4988.            777            GPV(2) = VARIB(54,M)                                                    V1049880
 4989.            778            GPV(3) = VARIB(55,M)                                                    V1049890
 4990.            779            GPV(4) = VARIB(56,M)                                                    V1049900
 4991.            780            GPV(5) = VARIB(57,M)                                                    V1049910
 4992.            781            EOS(4) = VARIB(58,M)                                                    V1049920
 4993.            782            EOS(5) = VARIB(59,M)                                                    V1049930
 4994.            783            IPWRET = 0                                                              V1049940
 4995.            784       1760 W = ABS(W)                                                              V1049950
 4996.            785            IF (PO .LE. 1.0) GO TO 3460                                             V1049960
 4997.            786            IF (WV .LT. 7.) GO TO 3470                                              V1049970
 4998.                       C **** WHEEL SENSOR CHARACTERISTICS. ****                                    V1049980
 4999.            787            DT = T - TLAST                                                          V1049990
 5000.            788            TLAST = T                                                               V1050000
 5001.            789            WAL = W - (W - WALLST) * EXP(-ALW1(L)*DT)                               V1050010
 5002.            790            WALDOT = (WAL - WALLST) / DT                                            V1050020
 5003.            791            WDD = WALDOT - (WALDOT - WDDLST) * EXP(-ALW2(L)*DT)                     V1050030
 5004.            792            WALLST = WAL                                                            V1050040
 5005.            793            WDDLST = WDD                                                            V1050050
 5006.                       C *** WDMAX,WDMIN. ***                                                       V1050060
 5007.            794            IF (WDD .GE. 0. .AND. WDD .LT. VARIB(4,L)) GO TO 1770                   V1050070
 5008.            795            IF (WDD .GE. 0. .AND. WDD .GT. VARIB(4,L)) GO TO 1800                   V1050080
 5009.            796            IF (WDD .LT. 0. .AND. WDD .GT. VARIB(4,L)) GO TO 1790                   V1050090
 5010.            797            GO TO 1780                                                              V1050100
 5011.            798       1770 IF (IDOWN(L) .EQ. 1) GO TO 1780                                         V1050110
 5012.            799            IF (ON .EQ. 1) WDMAX = WDD                                              V1050120
 5013.            800            VARIB(19,M) = WDMAX                                                     V1050130
 5014.            801       1780 IDOWN(L) = 1                                                            V1050140
 5015.            802            IUP(L) = 0                                                              V1050150
 5016.            803            GO TO 1810                                                              V1050160
 5017.            804       1790 IF (IUP(L) .EQ. 1) GO TO 1800                                           V1050170
 5018.            805            IF (OFF .EQ. 1) WDMIN = WDD                                             V1050180
 5019.            806            VARIB(20,M) = WDMIN                                                     V1050190
 5020.            807       1800 IUP(L) = 1                                                              V1050200
 5021.            808            IDOWN(L) = 0                                                            V1050210
 5022.            809       1810 CONTINUE                                                                V1050220
 5023.                       C *** WMAX,WMIN. ***                                                         V1050230
 5024.            810            IF (IDOWN(L) .EQ. 1 .AND. SIGN(1.,WDD) .EQ. SIGN(1.,VARIB(4,L)) .    V1050240
 5025.                          1   OR. IUP(L) .EQ. 1) GO TO 1820                                        V1050250
 5026.            811            WMAX2 = WMAX1                                                           V1050260
 5027.            812            WMAX1 = WAL                                                             V1050270
 5028.            813            TWMAX2 = TWMAX1                                                         V1050280
 5029.            814            TWMAX1 = T                                                              V1050290
 5030.            815            VARIB(45,M) = WMAX1                                                     V1050300
 5031.            816            VARIB(46,M) = WMAX2                                                     V1050310
 5032.            817            VARIB(47,M) = TWMAX1                                                    V1050320
 5033.            818            VARIB(48,M) = TWMAX2                                                    V1050330
 5034.            819            GO TO 1830                                                              V1050340
 5035.            820       1820 IF (IUP(L) .EQ. 1 .AND. SIGN(1.,WDD) .EQ. SIGN(1.,VARIB(4,L)) .OR.V1050350
 5036.                          1   IDOWN(L) .EQ. 1) GO TO 1830                                          V1050360
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   MTS          INTERNAL       ****  F T N T  I D Y ****
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5037.             821           WMIN = WAL                                          V1050370
5038.             822           TWMIN = T                                           V1050380
5039.             823           VARIB(49,M) = WMIN                                  V1050390
5040.             824           VARIB(50,M) = TWMIN                                 V1050400
5041.             825    1830   VARIB(3,L) = WAL                                    V1050410
5042.             826           VARIB(4,L) = WDD                                    V1050420
5043.             827           VARIB(2,L) = T                                      V1050430
5044.                          C *** LOGIC SAMPLING RATE CONTROL. ***               V1050440
5045.             828           IF ((T - TSMPO(M)) .GE. TSMPLE(M)) GO TO 1850       V1050450
5046.             829           IPWRET = 1                                          V1050460
5047.             830           ION = 1                                             V1050470
5048.             831           IOFF = 1                                            V1050480
5049.             832           IF (IPWMKY(L) .GE. 0) GO TO 2010                    V1050490
5050.             833    1840   IF (ION .EQ. 1) GO TO 3240                          V1050500
5051.             834           IF (IOFF .EQ. 1) GO TO 2690                         V1050510
5052.             835           ION = ICNT(M)                                       V1050520
5053.             836           IOFF = IOFFT(M)                                     V1050530
5054.             837           GO TO 2340                                          V1050540
5055.             838    1850   CONTINUE                                            V1050550
5056.             839           TSMPO(L) = T                                        V1050560
5057.                          C *** PULSE-WIDTH MODULATOR. ***                    V1050570
5058.             840           IF (IPWMKY(L) .LE. - 1) GO TO 2030                  V1050580
5059.             841           IF (T .GT. .001) GO TO 1860                         V1050590
5060.             842           SQUARE = 0.                                         V1050600
5061.             843           CLOCKO(L) = T                                       V1050610
5062.             844           GO TO 2030                                          V1050620
5063.             845    1860   I = 7                                               V1050630
5064.             846           IDUM = NTPWM(L)                                     V1050640
5065.             847           DO 1890 J = 1, IDUM                                 V1050650
5066.             848             DO 1870 K = 1, 4                                  V1050660
5067.             849    1870     BLEID(J,K,L) = RIDPW(J,K,L)                       V1050670
5068.             850             DO 1880 K = 1, 5                                  V1050680
5069.             851    1880     BLEOFF(J,K,I) = PW(J,K,L)                         V1050690
5070.             852    1890   CONTINUE                                            V1050700
5071.             853           GO TO 3480                                          V1050710
5072.             854    1900   IF ((T - CLOCKO(L)) .GE. PERIOD(L)) CLOCKO(L) = T   V1050720
5073.             855           K = 1                                               V1050730
5074.             856           IF (ABS(RMORE(L)) .LT. .001) GO TO 1920             V1050740
5075.             857           SGN = 1.                                            V1050750
5076.             858           IF (ZID(1,L) .LT. 0.) SGN = -1.                     V1050760
5077.             859           JK = ZID(1,L) + .1 * SGN                            V1050770
5078.             860           JK = IABS(JK)                                       V1050780
5079.             861           IF (VARIB(JK,L)*SGN .GT. ZBR(1,L)) K = 2            V1050790
5080.             862           IF (ABS(ZID(2,L)) .LT. 0.8) GO TO 1920              V1050800
5081.             863           SGN = 1.                                            V1050810
5082.             864           IF (ZID(2,L) .LT. 0.) SGN = -1.                     V1050820
5083.             865           JK = ZID(2,L) + .1 * SGN                            V1050830
5084.             866           JK = IABS(JK)                                       V1050840
5085.             867           IF (RMORE(L) .GT. 0.) GO TO 1910                    V1050850
5086.             868           IF (VARIB(JK,L)*SGN .GT. ZBR(2,L)) K = 3            V1050860
5087.             869           GO TO 1920                                          V1050870
5088.             870    1910   IF (VARIB(JK,I)*SGN .GT. ZBR(2,L) .AND. K .EQ. 2) K = 3  V1050880
5089.             871    1920   IREG = 6                                            V1050890
5090.             872           IF (EPSI(7) .LT. Z5(L)) IREG = 5                    V1050900
5091.             873           IF (EPSI(7) .LT. Z4(L)) IREG = 4                    V1050910
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   MTS          INTERNAL       **** F T N T I D Y ****
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5092.             874              IF (EPSI(7) .LT. Z3(L)) IREG = 3                                    V1050920
5093.             875              IF (EPSI(7) .LT. Z2(L)) IREG = 2                                    V1050930
5094.             876              IF (EPSI(7) .LT. Z1(L)) IREG = 1                                    V1050940
5095.             877              GO TO (1930, 1940, 1950, 1960, 1970, 1980), IREG                    V1050950
5096.             878         1930 TMOD(L) = FZ(1,K,L) * PERIOD(L)                                     V1050960
5097.             879              GO TO 2010                                                          V1050970
5098.             880         1940 DUM1 = Z1(L)                                                        V1050980
5099.             881              DUM2 = Z2(L)                                                        V1050990
5100.             882              DUM3 = FZ(1,K,L)                                                    V1051000
5101.             883              DUM4 = FZ(2,K,L)                                                    V1051010
5102.             884              GO TO 1990                                                          V1051020
5103.             885         1950 DUM1 = Z2(L)                                                        V1051030
5104.             886              DUM2 = Z3(L)                                                        V1051040
5105.             887              DUM3 = FZ(2,K,L)                                                    V1051050
5106.             888              DUM4 = FZ(3,K,L)                                                    V1051060
5107.             889              GO TO 1990                                                          V1051070
5108.             890         1960 DUM1 = Z3(L)                                                        V1051080
5109.             891              DUM2 = Z4(L)                                                        V1051090
5110.             892              DUM3 = FZ(3,K,L)                                                    V1051100
5111.             893              DUM4 = FZ(4,K,L)                                                    V1051110
5112.             894              GO TO 1990                                                          V1051120
5113.             895         1970 DUM1 = Z4(L)                                                        V1051130
5114.             896              DUM2 = Z5(L)                                                        V1051140
5115.             897              DUM3 = FZ(4,K,L)                                                    V1051150
5116.             898              DUM4 = FZ(5,K,L)                                                    V1051160
5117.             899              GO TO 1990                                                          V1051170
5118.             900         1980 TMOD(L) = FZ(5,K,L) * PERIOD(L)                                     V1051180
5119.             901              GO TO 2010                                                          V1051190
5120.             902         1990 IF (DUM1 .EQ. DUM2) GO TO 2000                                      V1051200
5121.             903              TMOD(L) = PERIOD(L) * ((DUM4 - DUM3)/(DUM2 - DUM1)*(EPSI(7) -       V1051210
5122.                             1DUM1) + DUM3)                                                      V1051220
5123.             904              GO TO 2010                                                          V1051230
5124.             905         2000 TMOD(L) = PERIOD(L) * DUM4                                          V1051240
5125.             906         2010 SQUARE = 1.0                                                        V1051250
5126.             907         2020 IF ((T - CLOCKO(L)) .GE. TMOD(L)) SQUARE = 0.                       V1051260
5127.             908              SQUARM = 1.0 - SQUARE                                               V1051270
5128.             909              IF (IPWRET .EQ. 1) GO TO 1840                                       V1051280
5129.                           C *** ONE-SHOT OPTION.***                                              V1051290
5130.             910         2030 IF (IOSKEY(L) .LE. - 1) GO TO 2160                                  V1051300
5131.             911              KK = 0                                                              V1051310
5132.             912         2040 KK = KK + 1                                                         V1051320
5133.             913              I = KK + 7                                                          V1051330
5134.             914              IDUM = NTOS(L,KK)                                                   V1051340
5135.             915              IF (IDUM .LE. 0) GO TO 2150                                         V1051350
5136.             916              DO 2070 J = 1, IDUM                                                 V1051360
5137.             917                DO 2050 K = 1, 4                                                  V1051370
5138.             918         2050     BUFIC(J,K,L) = RIOS(J,K,L,KK)                                   V1051380
5139.             919                DO 2060 K = 1, 5                                                  V1051390
5140.             920         2060     BUFCOE(J,K,L) = WCS(J,K,L,KK)                                   V1051400
5141.             921         2070 CONTINUE                                                            V1051410
5142.             922              GO TO 3480                                                          V1051420
5143.             923         2080 IF (EPSI(I) .GE. 0.) GO TO 2090                                     V1051430
5144.             924              GO TO 2100                                                          V1051440
5145.             925         2090 IF (INEW(L,KK) .EQ. 0) GO TO 2100                                   V1051450
5146.             926              INEW(L,KK) = 1                                                      V1051460
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   MTS          INTERNAL       **** F T N T I C Y ****
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5147.           927      2100 FOS(KK) = 1.0                                                    V1051470
5148.           928           INEW(L,KK) = 0                                                   V1051480
5149.           929           IF (T .GE. (TNEW(L,KK) + TCS(L,KK))) FCS(KK) = 0.                V1051490
5150.           930           IF (EPSI(I) .LT. 0. .AND. FOS(KK) .EQ. 0.) INEW(L,KK) = 1        V1051500
5151.           931           IDUM = NTCLR(L,KK)                                               V1051510
5152.           932           IF (IDUM .LE. 0) GO TO 2150                                      V1051520
5153.           933           DO 2130 J = 1, IDUM                                              V1051530
5154.           934             DO 2110 K = 1, 4                                               V1051540
5155.           935      2110   BUFID(J,K,L) = RIDCLR(J,K,L,KK)                                V1051550
5156.           936             DO 2120 K = 1, 5                                               V1051560
5157.           937      2120   BUFCCF(J,K,L) = WCLR(J,K,L,KK)                                 V1051570
5158.           938      2130 CONTINUE                                                         V1051580
5159.           939           I = I + 5                                                        V1051590
5160.           940           GO TO 3480                                                       V1051600
5161.           941      2140 IF (EPSI(I) .GE. 0) INEW(L,KK) = 1                               V1051610
5162.           942           IF (EPSI(I) .GE. 0.) FOS(KK) = 0.                                V1051620
5163.           943           IF (EPSI(I) .GE. 0) TNEW(L,KK) = -99999.                         V1051630
5164.           944           IF (KK .LE. 3) VARIB(40 + KK,L) = FOS(KK)                        V1051640
5165.           945           IF (KK .EQ. 4 .OR. KK .EQ. 5) VARIB(54 + KK,L) = FOS(KK)         V1051650
5166.           946      2150 IF (KK .LE. 4) GO TO 2040                                        V1051660
5167.           947      2160 IF (IGPKEY(L) .LE. - 1) GO TO 2210                               V1051670
5168.           948           I = 18                                                           V1051680
5169.           949           IDUM = NTGP(L)                                                   V1051690
5170.           950           IF (IDUM .LE. 0) GO TO 2210                                      V1051700
5171.           951           DO 2190 J = 1, IDUM                                              V1051710
5172.           952             DO 2170 K = 1, 4                                               V1051720
5173.           953      2170   BUFID(J,K,L) = RIDGP(J,K,L)                                    V1051730
5174.           954             DO 2180 K = 1, 5                                               V1051740
5175.           955      2180   BUFCCF(J,K,L) = GP(J,K,L)                                      V1051750
5176.           956      2190 CONTINUE                                                         V1051760
5177.           957           GO TO 3480                                                       V1051770
5178.           958      2200 IF (EPSI(18) .GE. 0.) GPCNT = GPCNT + 1.                         V1051780
5179.           959           IF (EPSI(18) .LE. - 10000.) GPCNT = 0.                           V1051790
5180.           960      2210 IF (IGPVKY(L) .LE. - 1) GO TO 2280                               V1051800
5181.           961           KK = 0                                                           V1051810
5182.           962      2220 KK = KK + 1                                                      V1051820
5183.           963           I = KK + 18                                                      V1051830
5184.           964           IDUM = NTGPV(L,KK)                                               V1051840
5185.           965           IF (IDUM .LE. 0) GO TO 2270                                      V1051850
5186.           966           DO 2250 J = 1, IDUM                                              V1051860
5187.           967             DO 2230 K = 1, 4                                               V1051870
5188.           968      2230   BUFID(J,K,L) = RIDGPV(J,K,L,KK)                                V1051880
5189.           969             DO 2240 K = 1, 5                                               V1051890
5190.           970      2240   BUFCCF(J,K,L) = GPVV(J,K,L,KK)                                 V1051900
5191.           971      2250 CONTINUE                                                         V1051910
5192.           972           GO TO 3480                                                       V1051920
5193.           973      2260 GPV(KK) = EPSI(KK + 18)                                          V1051930
5194.           974           VARIB(52 + KK,L) = GPV(KK)                                       V1051940
5195.           975      2270 IF (KK .LE. 4) GO TO 2220                                        V1051950
5196.           976      2280 CONTINUE                                                         V1051960
5197.           977           VARIB(3,L) = WAL                                                 V1051970
5198.           978           VARIB(4,L) = WCC                                                 V1051980
5199.           979           TLOCK = 0.                                                       V1051990
5200.           980           WLOCK = -0.000001                                                V1052000
5201.           981           SLIP = 1.0 - WAL / WV                                            V1052010
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   MTS          INTERNAL       **** F T N T I D Y ****
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  5202.          982           IF (SLIP .GE. 0.95) GO TO 2290                    V1052020
  5203.          983           GO TO 2300                                        V1052030
  5204.          984     2290  WLOCK = L.0                                       V1052040
  5205.          985           DELT = TSMPLE(M)                                  V1052050
  5206.          986           IF (TSMPLE(M) .LT. DT) DELT = DT                  V1052060
  5207.          987           TLOCK = VARIB(24,L) + DELT                        V1052070
  5208.          988     2300  CONTINUE                                          V1052080
  5209.          989           IF (ON - 1) 2310, 3240, 2310                      V1052090
  5210.          990     2310  IF (OFF - 1) 2320, 2690, 2320                    V1052100
  5211.          991     2320  IF (OFFT - 1) 240), 2330, 2400                   V1052110
  5212.          992     2330  IF (T - TL - TAU1(L)) 2340, 2440, 2440           V1052120
  5213.          993     2340  CNT(M) = CN                                       V1052130
  5214.          994           OFFI(M) = OFF                                     V1052140
  5215.          995           CNTI(M) = ONT                                     V1052150
  5216.          996           OFFTI(M) = OFFT                                   V1052160
  5217.          997           IOP(M) = OP                                       V1052170
  5218.          998           OPI(M) = OP                                       V1052180
  5219.          999           IXLSTI(M) = IXLAST                                V1052190
  5220.         1000           IYLSTI(M) = IYLAST                                V1052200
  5221.         1001           IONI(M) = ION                                     V1052210
  5222.         1002           IOFFI(M) = IOFF                                   V1052220
  5223.         1003           ONEI(M) = ONE                                     V1052230
  5224.         1004           WOLSTI(M) = WOCLST                                V1052240
  5225.         1005           WALSTI(M) = WALLST                                V1052250
  5226.         1006           TLSTI(M) = TLAST                                  V1052260
  5227.         1007           WII(M) = WI                                       V1052270
  5228.         1008           TII(M) = T1                                       V1052280
  5229.         1009           T2I(M) = T2                                       V1052290
  5230.         1010           T3I(M) = T3                                       V1052300
  5231.         1011           T4I(M) = T4                                       V1052310
  5232.         1012           TCI(M) = TC                                       V1052320
  5233.         1013           VARIB(2,M) = T                                    V1052330
  5234.         1014           VARIB(3,M) = WAL                                  V1052340
  5235.         1015           VARIB(4,M) = WCC                                  V1052350
  5236.         1016           VARIB(5,M) = WV                                   V1052360
  5237.         1017           VARIB(6,M) = WVC                                  V1052370
  5238.         1018           VARIB(7,M) = PCFF1                                V1052380
  5239.         1019           VARIB(8,M) = PCFF2                                V1052390
  5240.         1020           VARIB(9,M) = PCN1                                 V1052400
  5241.         1021           VARIB(10,M) = PCN2                                V1052410
  5242.         1022           VARIB(11,M) = TOFF1                               V1052420
  5243.         1023           VARIB(12,M) = TON1                                V1052430
  5244.         1024           VARIB(13,M) = XOFF                                V1052440
  5245.         1025           VARIB(14,M) = XON                                 V1052450
  5246.         1026           VARIB(15,M) = WOFF                                V1052460
  5247.         1027           VARIB(16,M) = WCN                                 V1052470
  5248.         1028           VARIB(17,M) = WEOFF                               V1052480
  5249.         1029           VARIB(18,M) = WCCN                                V1052490
  5250.         1030           VARIB(19,M) = WCMAX                               V1052500
  5251.         1031           VARIB(20,M) = WCMIN                               V1052510
  5252.         1032           VARIB(21,M) = TPMAX1                              V1052520
  5253.         1033           VARIB(22,M) = TPMIN1                              V1052530
  5254.         1034           VARIB(23,M) = WLOCK                               V1052540
  5255.         1035           VARIB(24,M) = TLOCK                               V1052550
  5256.         1036           VARIB(25,M) = SLON                                V1052560
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   MTS          INTERNAL      ****  F T N T  I D Y ****
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 5257.          1037          VARIB(26,M) = SLOPE                                                    V1052570
 5258.          1038          VARIB(27,M) = PMAX1                                                    V1052580
 5259.          1039          VARIB(28,M) = PMAX2                                                    V1052590
 5260.          1040          VARIB(29,M) = PMIN1                                                    V1052600
 5261.          1041          VARIB(30,M) = PMIN2                                                    V105261C
 5262.          1042          VARIB(31,M) = PD                                                       V1052620
 5263.          1043          VARIB(32,M) = CN                                                       V1052630
 5264.          1044          VARIB(33,M) = TMOD(L)                                                  V105264C
 5265.          1045          VARIB(34,M) = SLIP                                                     V1052650
 5266.          1046          VARIB(35,M) = PRET                                                     V1052660
 5267.          1047          VARIB(36,M) = CYCNT                                                    V105267C
 5268.          1048          VARIB(37,M) = SQUARE                                                   V1052680
 5269.          1049          VARIB(38,M) = SQUARN                                                   V105269C
 5270.          1050          VARIB(39,M) = TOFF2                                                    V1052700
 5271.          1051          VARIB(40,M) = TON2                                                     V1052710
 5272.          1052          VARIB(44,M) = GPCNT                                                    V1052720
 5273.          1053          VARIB(45,M) = WMAX1                                                    V1052730
 5274.          1054          VARIB(46,M) = WMAX2                                                    V1052740
 5275.          1055          VARIB(47,M) = TWMAX1                                                   V1052750
 5276.          1056          VARIB(48,M) = TWMAX2                                                   V1052760
 5277.          1057          VARIB(49,M) = WMIN                                                     V1052770
 5278.          1058          VARIB(50,M) = TWMIN                                                    V105278C
 5279.          1059          VARIB(51,M) = TPMAX2                                                   V1052790
 5280.          1060          VARIB(52,M) = TPMIN2                                                   V1052800
 5281.          1061          RETURN                                                                 V1052810
 5282.                      C *****  EVALUATE INEQUALITY EXPRESSIONS.  *****                        V1052820
 5283.          1062       2350 FINC(I) = 0.                                                         V1052830
 5284.          1063            DO 2390 J = 1, NN                                                    V105284C
 5285.          1064              KM = 1                                                             V1052850
 5286.          1065              DUM = RID(I,J,3,L)                                                 V105286C
 5287.          1066              SGN = 1.                                                           V1052870
 5288.          1067              IF (DUM .LT. 0.) SGN = -1.                                         V1052880
 5289.          1068              DUM = DUM + .1 * SGN                                               V1052890
 5290.          1069              IF (ABS(DUM) .LE. 0.99 .OR. ABS(DUM) .GE. 60.5) GO TO 2360         V1052900
 5291.          1070              JK = ABS(DUM)                                                      V1052910
 5292.          1071              IF (VARIB(JK,L)*SGN .GT. COEF(I,J,4,L)) KM = 2                     V1052920
 5293.          1072       2360   DUM = RID(I,J,4,L)                                                 V1052930
 5294.          1073              SGN = 1.                                                           V105294C
 5295.          1074              IF (DUM .LT. 0.) SGN = -1.                                         V1052950
 5296.          1075              DUM = DUM + .1 * SGN                                               V1052960
 5297.          1076              IF (ABS(DUM) .LE. 0.99 .OR. ABS(DUM) .GE. 60.5) GO TO 2380         V105297C
 5298.          1077              JK = ABS(DUM)                                                      V1052980
 5299.          1078              IF (RID(I,J,2,L) .LT. - .001) GO TO 2370                           V1052990
 5300.          1079              IF (VARIB(JK,L)*SGN .GT. COEF(I,J,5,L)) KM = 3                     V1053000
 5301.          1080              GO TO 2380                                                         V1053010
 5302.          1081       2370   IF (VARIB(JK,L)*SGN .GT. COEF(I,J,5,L) .AND. KM .EQ. 2)           V1053020
 5303.                        1   KM = 3                                                             V1053030
 5304.          1082       2380   CONTINUE                                                           V1053040
 5305.          1083              JL = RID(I,J,1,L) + .1                                             V1053050
 5306.          1084              JM = 1                                                             V1053060
 5307.          1085              IF (J .EQ. 4 .OR. J .EQ. 5) JM = ABS(RID(I,J,2,L)) + .1            V1053070
 5308.          1086              FINC(I) = COEF(I,J,KM,L) * VARIB(JL,L) * VARIB(JM,L) + FINC(I)     V105308C
 5309.          1087       2390 CONTINUE                                                             V1053090
 5310.          1088            GO TO (2410, 2450, 2500, 2550, 2600, 3000, 3050, 3100), I          V1053100
 5311.          1089            GO TO 2340                                                         V1053110
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   MTS          INTERNAL       **** F T N T I C Y ****
LINE NO.        STMT NO.       INPUT LISTING

5312.                       C **** CHECK FIRST 'CEE' INEQUALITY. ****                    V1053120
5313.           1090         240C I = 1                                                  V1053130
5314.           1091              NN = NTE(I,L)                                          V1053140
5315.           1092              GO TO 2350                                             V1053150
5316.           1093         241C IF (FINQ(1)) 2430, 2420, 2420                          V1053160
5317.           1094         2420 OEET = 1                                               V1053170
5318.           1095              TI = T                                                 V1053180
5319.           1096              QL1 = .TRUE.                                           V1053190
5320.           1097              GO TO 2330                                             V1053200
5321.           1098         2430 CEET = 0                                               V1053210
5322.           1099              QL1 = .FALSE.                                          V1053220
5323.           1100              TI = T                                                 V1053230
5324.           1101              GO TO 2330                                             V1053240
5325.                       C **** CHECK SECOND 'OEE' INEQUALITY. ****                   V1053250
5326.           1102         2440 I = 2                                                  V1053260
5327.           1103              NN = NTE(I,L)                                          V1053270
5328.           1104              IF (QLC2) GO TO 235C                                   V1053280
5329.           1105              GO TO 2490                                             V1053290
5330.           1106         245C IF (FINQ(2)) 2470, 2460, 2460                          V1053300
5331.           1107         2460 QL2 = .TRUE.                                           V1053310
5332.           1108              GO TO 2490                                             V1053320
5333.           1109         247C QL2 = .FALSE.                                          V1053330
5334.           1110         2480 IF (QLC3) GO TO 249C                                   V1053340
5335.           1111              GO TO 2520                                             V1053350
5336.                       C **** CHECK THIRD 'OEE' INEQUALITY. ****                    V1053360
5337.           1112         2490 I = 3                                                  V1053370
5338.           1113              NN = NTE(I,L)                                          V1053380
5339.           1114              GO TO 2350                                             V1053390
5340.           1115         2500 IF (FINQ(3)) 2510, 2520, 2520                          V1053400
5341.           1116         2510 QL3 = .FALSE.                                          V1053410
5342.           1117              GO TO 2530                                             V1053420
5343.           1118         2520 QL3 = .TRUE.                                           V1053430
5344.           1119         253C IF (QLC4) GO TO 254C                                   V1053440
5345.           1120              GO TO 2570                                             V1053450
5346.                       C **** CHECK FOURTH 'CEE' INEQUALITY. ****                   V1053460
5347.           1121         2540 I = 4                                                  V1053470
5348.           1122              NN = NTE(I,L)                                          V1053480
5349.           1123              GO TO 2350                                             V1053490
5350.           1124         2550 IF (FINQ(4)) 256C, 257C, 2570                          V1053500
5351.           1125         2560 QL4 = .FALSE.                                          V1053510
5352.           1126              GO TO 2580                                             V1053520
5353.           1127         257C QL4 = .TRUE.                                           V1053530
5354.                       C **** LOGICAL EXPRESSIONS FOR 'AND'ING,'OR'ING,AND IGNORING F1,F2,F3,  V1053540
5355.                       C       F4 CRITERIA. ****                                   V1053550
5356.           1128         258C QDUM1 = QL1 .AND. QLC1                                 V1053560
5357.           1129              QDUM2 = QL2 .AND. QLC2                                 V1053570
5358.           1130              IF (IOP12(L)) 26C0, 2630, 2590                         V1053580
5359.           1131         2590 QCEE1 = QDUM1 .AND. QDUM2                              V1053590
5360.           1132              GO TO 2610                                             V1053600
5361.           1133         26C0 QOEE1 = QDUM1 .OR. QDUM2                               V1053610
5362.           1134         261C QDUM2 = QL3 .AND. QLC3                                 V1053620
5363.           1135              QDUM3 = QL4 .AND. QLC4                                 V1053630
5364.           1136              IF (IOP34(L)) 262), 2620, 2630                         V1053640
5365.           1137         2620 QOEE2 = QDUM2 .OR. QDUM3                               V1053650
5366.           1138              GO TO 2640                                             V1053660
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   MTS          INTERNAL        ****  F I N I T O Y ****
 LINE NO.       STMT NO.        INPUT LISTING

 5367.          1139      2630 COEF2 = QDUM2 .AND. QDUM3                                  V1053670
 5368.          1140      2640 IF (IOP23(L)) 2650, 2650, 2660                             V1053680
 5369.          1141      2650 COEF = COEF1 .OR. COEF2                                    V1053690
 5370.          1142           GO TO 2670                                                 V1053700
 5371.          1143      2660 COEF = COEF1 .AND. COEF2                                   V1053710
 5372.          1144      2670 IF (COEF) GO TO 2680                                       V1053720
 5373.          1145           OFF1 = 0                                                   V1053730
 5374.          1146           GO TO 2340                                                 V1053740
 5375.          1147      2680 OFF1 = 0                                                   V1053750
 5376.          1148           OFF = 1                                                    V1053760
 5377.          1149           ON = 0                                                     V1053770
 5378.          1150           T2 = T                                                     V1053780
 5379.          1151           POFF2 = POFF1                                              V1053790
 5380.          1152           POFF1 = P                                                  V1053800
 5381.          1153           TOFF2 = TOFF1                                              V1053810
 5382.          1154           TOFF1 = T                                                  V1053820
 5383.          1155           XDOFF = WV                                                 V1053830
 5384.          1156           WOFF = WAL                                                 V1053840
 5385.          1157           WDOFF = WDD                                                V1053850
 5386.          1158           SLOFF = SLIP                                               V1053860
 5387.          1159           GO TO 2690                                                 V1053870
 5388.                       C **** BRAKE MODULATOR PRESSURE FALL CHARACTERISTICS. ****   V1053880
 5389.          1160      2690 IF (T - T2 - TAUOFF(L)) 2700, 2720, 2720                   V1053890
 5390.          1161      2700 IF (ONE - 1) 2710, 2340, 2710                              V1053900
 5391.          1162      2710 IOFF = 1                                                   V1053910
 5392.          1163           GO TO 3240                                                 V1053920
 5393.          1164      2720 LQ = 0                                                     V1053930
 5394.          1165           TLIN = 0.                                                  V1053940
 5395.          1166           TC = 0.                                                    V1053950
 5396.          1167      2730 IF (IPKEY(L) .NE. 0 .AND. IPKEY(L) .NE. 2) GO TO 2770      V1053960
 5397.          1168           I = 1                                                      V1053970
 5398.          1169           IF (LQ .EQ. 5) I = 2                                       V1053980
 5399.          1170           IF (LQ .EQ. 5) GO TO 3480                                  V1053990
 5400.          1171           IDUM = NT1(L)                                              V1054000
 5401.          1172           DO 2760 J = 1, IDUM                                        V1054010
 5402.          1173             DO 2740 K = 1, 4                                         V1054020
 5403.          1174      2740     BUFID(J,K,L) = RIDF(J,K,I)                            V1054030
 5404.          1175             DO 2750 K = 1, 5                                         V1054040
 5405.          1176      2750     BUFCOF(J,K,L) = FF(J,K,L)                             V1054050
 5406.          1177      2760 CONTINUE                                                   V1054060
 5407.          1178           GO TO 3490                                                 V1054070
 5408.          1179      2770 IF (IPKEY(L) .NE. 1 .AND. IPKEY(L) .NE. 2) GO TO 2810      V1054080
 5409.          1180           I = 3                                                      V1054090
 5410.          1181           IF (LQ .EQ. 5) I = 4                                       V1054100
 5411.          1182           IF (LQ .EQ. 5) GO TO 3480                                  V1054110
 5412.          1183           IDUM = NT3(L)                                              V1054120
 5413.          1184           DO 2800 J = 1, IDUM                                        V1054130
 5414.          1185             DO 2780 K = 1, 4                                         V1054140
 5415.          1186      2780     BUFID(J,K,L) = RIDR(J,K,L)                            V1054150
 5416.          1187             DO 2790 K = 1, 5                                         V1054160
 5417.          1188      2790     BUFCOF(J,K,L) = FR(J,K,L)                             V1054170
 5418.          1189      2800 CONTINUE                                                   V1054180
 5419.          1190           GO TO 3480                                                 V1054190
 5420.          1191      2810 IF (IPKEY(L) .LE. - 1) GO TO 2870                          V1054200
 5421.          1192           I = 5                                                      V1054210
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   MTS          INTERNAL       **** F T N T I D Y ****
 LINE NO.       STMT NO.       INPUT LISTING

5422.           1193           IF (LO .EQ. 5) I = 6                                                    V1054220
5423.           1194           IF (LO .EQ. 5) GO TO 3480                                               V1054230
5424.           1195           IDUM = NTPDF(L)                                                         V1054240
5425.           1196           DO 2840 J = 1, IDUM                                                     V1054250
5426.           1197             DO 2820 K = 1, 4                                                      V1054260
5427.           1198    2820     BUFID(J,K,L) = VID(J,K,L)                                             V1054270
5428.           1199             DO 2830 K = 1, 5                                                      V1054280
5429.           1200    2830     BUFCOF(J,K,L) = VV(J,K,L)                                             V1054290
5430.           1201    2840   CONTINUE                                                                V1054300
5431.           1202           GO TO 3480                                                              V1054310
5432.           1203    2850   TC = PFF3(L)                                                            V1054320
5433.           1204           IF (EPSI(1) .LT. ALX2(L)) TC = PFF2(L)                                  V1054330
5434.           1205           IF (EPSI(1) .LT. ALX1(L)) TC = PFF1(L)                                  V1054340
5435.           1206           GO TO 2770                                                              V1054350
5436.           1207    2860   TLIN = PFL3(L)                                                          V1054360
5437.           1208           IF (EPSI(3) .LT. ALX6(L)) TLIN = PFL2(L)                                V1054370
5438.           1209           IF (EPSI(3) .LT. ALX5(L)) TLIN = PFL1(L)                                V1054380
5439.           1210           GO TO 2810                                                              V1054390
5440.           1211    2870   IF (LO .EQ. 5) GO TO 3400                                               V1054400
5441.           1212           PDFALL = 0.                                                             V1054410
5442.           1213           GO TO 2890                                                              V1054420
5443.           1214    2880   PDFALL = EPSI(5)                                                        V1054430
5444.           1215    2890   IF (IXLAST .NE. 0) GO TO 2900                                           V1054440
5445.           1216           PMAX2 = PMAX1                                                           V1054450
5446.           1217           PMAX1 = P                                                               V1054460
5447.           1218           TPMAX2 = TPMAX1                                                         V1054470
5448.           1219           TPMAX1 = T                                                              V1054480
5449.           1220           CYCNT = VARIB(36,L) + 1.0                                               V1054490
5450.           1221    2900   PRET = (PO(L) - PDFALL) * (EXP(-TC*DT)) + PDFALL - TLIN * DT            V1054500
5451.           1222           IF (PRET .LT. 0.) PRET = 0.                                             V1054510
5452.           1223           IXLAST = 1                                                              V1054520
5453.           1224           IYLAST = 0                                                              V1054530
5454.           1225           OP = 1                                                                  V1054540
5455.           1226           IOP(M) = OP                                                             V1054550
5456.           1227           IF (T - T2 - TAU2(L)) 2340, 2910, 2910                                  V1054560
5457.           1228    2910   IF (ION - 1) 2930, 2920, 2930                                           V1054570
5458.           1229    2920   ION = 0                                                                 V1054580
5459.           1230           GO TO 2340                                                              V1054590
5460.                        C **** CHECK FIRST 'ON' INEQUALITY. ****                                  V1054600
5461.           1231    2930   IF (CNT - 1) 2950, 2940, 2950                                           V1054610
5462.           1232    2940   IF (T - T3 - TAU3(L)) 2340, 2990, 2990                                  V1054620
5463.           1233    2950   I = 5                                                                   V1054630
5464.           1234           NN = NTN(I - 4,L)                                                       V1054640
5465.           1235           GO TO 2350                                                              V1054650
5466.           1236    2960   IF (FINC(5)) 2980, 2970, 2970                                           V1054660
5467.           1237    2970   CNT = 1                                                                 V1054670
5468.           1238           T3 = T                                                                  V1054680
5469.           1239           CL5 = .TRUE.                                                            V1054690
5470.           1240           GO TO 2940                                                              V1054700
5471.           1241    2980   CNT = 0                                                                 V1054710
5472.           1242           CL5 = .FALSE.                                                           V1054720
5473.           1243           T3 = T                                                                  V1054730
5474.           1244           GO TO 2940                                                              V1054740
5475.                        C **** CHECK SECOND 'ON' INEQUALITY. ****                                 V1054750
5476.           1245    2990   I = 6                                                                   V1054760
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   MTS          INTERNAL       ****  F T N T I D Y ****
LINE NO.        STMT NO.       INPUT LISTING

5477.             1246              NN = NTN(I - 4,L)                                    V1054770
5478.             1247              IF (QLC6) GO TO 2350                                 V1054780
5479.             1248              GO TO 3030                                           V1054790
5480.             1249         3000 IF (FINQ(6)) 3020, 3010, 3010                        V1054800
5481.             1250         3010 QL6 = .TRUE.                                         V1054810
5482.             1251              GO TO 3030                                           V1054820
5483.             1252         3020 QL6 = .FALSE.                                        V1054830
5484.             1253              GO TO 3030                                           V1054840
5485.             1254         3030 IF (QLC7) GO TO 3040                                 V1054850
5486.             1255              GO TO 3060                                           V1054860
5487.                            C **** CHECK THIRD 'ON' INEQUALITY.****                 V1054870
5488.             1256         3040 I = 7                                                V1054880
5489.             1257              NN = NTN(I - 4,L)                                    V1054890
5490.             1258              GO TO 2350                                           V1054900
5491.             1259         3050 IF (FINQ(7)) 3070, 3060, 3060                        V1054910
5492.             1260         3060 QL7 = .TRUE.                                         V1054920
5493.             1261              GO TO 3080                                           V1054930
5494.             1262         3070 QL7 = .FALSE.                                        V1054940
5495.             1263         3080 IF (QLC8) GO TO 3090                                 V1054950
5496.             1264              GO TO 3120                                           V1054960
5497.                            C **** CHECK FOURTH 'ON' INEQUALITY. ****               V1054970
5498.             1265         3090 I = 8                                                V1054980
5499.             1266              NN = NTN(I - 4,L)                                    V1054990
5500.             1267              GO TO 2350                                           V1055000
5501.             1268         3100 IF (FINQ(8)) 3110, 3120, 3120                        V1055010
5502.             1269         3110 QL8 = .FALSE.                                        V1055020
5503.             1270              GO TO 3130                                           V1055030
5504.             1271         3120 QL8 = .TRUE.                                         V1055040
5505.                            C **** LOGICAL EXPRESSIONS FOR 'AND'ING,'OR'ING,AND IGNORING F5,F6,F7,  V1055050
5506.                            C       F8 CRITERIA. ****                               V1055060
5507.             1272         3130 QDUM1 = QL5 .AND. QLC5                               V1055070
5508.             1273              QDUM2 = QL6 .AND. QLC6                               V1055080
5509.             1274              IF (IOP56(L)) 3150, 3150, 3140                       V1055090
5510.             1275         3140 QCN1 = QDUM1 .AND. QDUM2                             V1055100
5511.             1276              GO TO 3160                                           V1055110
5512.             1277         3150 QCN1 = QDUM1 .OR. QDUM2                              V1055120
5513.             1278         3160 QDUM2 = QL7 .AND. QLC7                               V1055130
5514.             1279              QDUM3 = QL8 .AND. QLC8                               V1055140
5515.             1280              IF (IOP78(L)) 3170, 3170, 3180                       V1055150
5516.             1281         3170 QCN2 = QDUM2 .OR. QDUM3                              V1055160
5517.             1282              GO TO 3190                                           V1055170
5518.             1283         3180 QCN2 = QDUM2 .AND. QDUM3                             V1055180
5519.             1284         3190 IF (IOP67(L)) 3200, 3200, 3210                       V1055190
5520.             1285         3200 QCN = QCN1 .OR. QCN2                                 V1055200
5521.             1286              GO TO 3220                                           V1055210
5522.             1287         3210 QCN = QCN1 .AND. QCN2                                V1055220
5523.             1288         3220 IF (QCN) GO TO 3230                                  V1055230
5524.             1289              CNT = 0                                              V1055240
5525.             1290              GO TO 2340                                           V1055250
5526.             1291         3230 CNT = 0                                              V1055260
5527.             1292              ON = 1                                               V1055270
5528.             1293              OFF = 0                                              V1055280
5529.             1294              I4 = 1                                               V1055290
5530.             1295              ONE = 0                                              V1055300
5531.             1296              QCN2 = QCN1                                          V1055310
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   MTS          INTERNAL       ****  F T N T I C Y ****
 LINE NO.       STMT NO.       INPUT LISTING

 5532.          1297           PON1 = P                                                    V1055320
 5533.          1298           TON2 = TON1                                                 V1055330
 5534.          1299           TON1 = T                                                    V1055340
 5535.          1300           XOCA = WV                                                   V1055350
 5536.          1301           WCA = WAL                                                   V1055360
 5537.          1302           WOCA = WDD                                                  V1055370
 5538.          1303           SLCA = SLIP                                                 V1055380
 5539.          1304           GO TO 3240                                                  V1055390
 5540.                       C **** BRAKE MODULATOR PRESSURE RISE CHARACTERISTICS. ****     V1055400
 5541.          1305    3240   IF (T - T4 - TAUON(L)) 3250, 3260, 3260                     V1055410
 5542.          1306    3250   IC = 1                                                      V1055420
 5543.          1307           GO TO 2690                                                  V1055430
 5544.          1308    3260   LC = 5                                                      V1055440
 5545.          1309           TLIN = 0.                                                   V1055450
 5546.          1310           IC = 0.                                                     V1055460
 5547.          1311           IF (IPKEY(L) .NE. 0 .AND. IPKEY(L) .NE. 2) GO TO 3310       V1055470
 5548.          1312           IDUM = NT2(L)                                               V1055480
 5549.          1313           DO 3290 J = 1, IDUM                                         V1055490
 5550.          1314             DO 3270 K = 1, 4                                          V1055500
 5551.          1315    3270     BLEID(J,K,L) = RIDG(J,K,L)                              V1055510
 5552.          1316             DO 3280 K = 1, 5                                          V1055520
 5553.          1317    3280     BLECOE(J,K,L) = GG(J,K,L)                               V1055530
 5554.          1318    3290   CONTINUE                                                    V1055540
 5555.          1319           GO TO 2730                                                  V1055550
 5556.          1320    3300   IC = PRE3(L)                                                V1055560
 5557.          1321           IF (EPSI(2) .LT. ALX4(L)) IC = PRE2(L)                      V1055570
 5558.          1322           IF (EPSI(2) .LT. ALX3(L)) IC = PRE1(L)                      V1055580
 5559.          1323    3310   IF (IPKEY(L) .NE. 1 .AND. IPKEY(L) .NE. 2) GO TO 3360       V1055590
 5560.          1324           IDUM = NT4(L)                                               V1055600
 5561.          1325           DO 3340 J = 1, IDUM                                         V1055610
 5562.          1326             DO 3320 K = 1, 4                                          V1055620
 5563.          1327    3320     BLEID(J,K,L) = RIDS(J,K,L)                              V1055630
 5564.          1328             DO 3330 K = 1, 5                                          V1055640
 5565.          1329    3330     BLECOE(J,K,L) = SS(J,K,L)                               V1055650
 5566.          1330    3340   CONTINUE                                                    V1055660
 5567.          1331           GO TO 2770                                                  V1055670
 5568.          1332    3350   TLIN = PRL3(L)                                              V1055680
 5569.          1333           IF (EPSI(4) .LT. ALX8(L)) TLIN = PRL2(L)                    V1055690
 5570.          1334           IF (EPSI(4) .LT. ALX7(L)) TLIN = PRL1(L)                    V1055700
 5571.          1335    3360   IF (IPDKEY(L) .LE. - 1) GO TO 2870                          V1055710
 5572.          1336           IDUM = NTPDR(L)                                             V1055720
 5573.          1337           DO 3390 J = 1, IDUM                                         V1055730
 5574.          1338             DO 3370 K = 1, 4                                          V1055740
 5575.          1339    3370     BLEID(J,K,L) = WID(J,K,L)                               V1055750
 5576.          1340             DO 3380 K = 1, 5                                          V1055760
 5577.          1341    3380     BLECOE(J,K,L) = WW(J,K,L)                               V1055770
 5578.          1342    3390   CONTINUE                                                    V1055780
 5579.          1343           GO TO 2810                                                  V1055790
 5580.          1344    3400   PDRSE = PD                                                  V1055800
 5581.          1345           GO TO 3420                                                  V1055810
 5582.          1346    3410   PDRSE = EPSI(6)                                             V1055820
 5583.          1347    3420   IF (IYLAST .NE. 0) GO TO 3430                               V1055830
 5584.          1348           PMIN2 = PMIN1                                               V1055840
 5585.          1349           PMIN1 = P                                                   V1055850
 5586.          1350           TPMIN2 = TPMIN1                                             V1055860
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   MTS          INTERNAL       ****  F I N I T I D Y ****
LINE NO.        STMT NO.       INPUT LISTING

5587.            1351           TPMINI = T                                                          V1055870
5588.            1352    3430   PRET = (PO(L) - PDESE) * (EXP(-TC*DT)) + PDESE + TLIN * DT         V1055880
5589.            1353           IF (PRET .GT. PD) PRET = PD                                         V1055890
5590.            1354           IYLAST = 1                                                          V1055900
5591.            1355           IXLAST = 0                                                          V1055910
5592.            1356           IF (T - T4 - TAU4(L)) 2340, 3440, 3440                              V1055920
5593.            1357    3440   IF (IOFF - 1) 2320, 3450, 2320                                      V1055930
5594.            1358    3450   IOFF = 0                                                            V1055940
5595.            1359           GO TO 2340                                                          V1055950
5596.                   C **** DEMANDED PRESSURE LESS THAN 1.0 --- TURN OFF ANTILOCK. ****          V1055960
5597.            1360    3460   IOP(M) = 0                                                          V1055970
5598.            1361           OP = 0                                                              V1055980
5599.            1362           GO TO 2340                                                          V1055990
5600.                   C **** VEHICLE VELOCITY LESS THAN V-CUTOFF. -- TURN OFF ANTILOCK. ****      V1056000
5601.            1363    3470   IALOPT(L) = 0                                                       V1056010
5602.            1364           GO TO 2340                                                          V1056020
5603.                   C ***** EVALUATE EPSILON EXPRESSIONS. *****                                  V1056030
5604.            1365    3480   EPSI(I) = 0.                                                        V1056040
5605.            1366           DO 3520 J = 1, IDUM                                                 V1056050
5606.            1367             KM = 1                                                            V1056060
5607.            1368             DUM = BUFID(J,3,L)                                                V1056070
5608.            1369             SGN = 1.                                                          V1056080
5609.            1370             IF (DUM .LT. 0.) SGN = -1.                                        V1056090
5610.            1371             DUM = DUM + .1 * SGN                                              V1056100
5611.            1372             IF (ABS(DUM) .LE. 0.99 .OR. ABS(DUM) .GE. 60.5) GO TO 3490        V1056110
5612.            1373             JK = ABS(DUM)                                                     V1056120
5613.            1374             IF (VARIB(JK,L)*SGN .GT. BUFCOF(J,4,I)) KM = 2                    V1056130
5614.            1375    3490     DUM = BUFID(J,4,L)                                                V1056140
5615.            1376             SGN = 1.                                                          V1056150
5616.            1377             IF (DUM .LT. 0.) SGN = -1.                                        V1056160
5617.            1378             DUM = DUM + .1 * SGN                                              V1056170
5618.            1379             IF (ABS(DUM) .LE. 0.99 .OR. ABS(DUM) .GE. 60.5) GO TO 3510        V1056180
5619.            1380             JK = ABS(DUM)                                                     V1056190
5620.            1381             IF (BUFID(J,2,L) .LT. - .001) GO TO 3500                          V1056200
5621.            1382             IF (VARIB(JK,L)*SGN .GT. BUFCOF(J,5,L)) KM = 2                    V1056210
5622.            1383             GO TO 3510                                                        V1056220
5623.            1384    3500     IF (VARIB(JK,L)*SGN .GT. BUFCOF(J,5,L) .AND. KM .EQ. 2)           V1056230
5624.                   1    1     KM = 3                                                            V1056240
5625.            1385    3510     CONTINUE                                                          V1056250
5626.            1386             JL = BUFID(J,1,L) + .1                                            V1056260
5627.            1387             JM = 1                                                            V1056270
5628.            1388             IF (J .EQ. 4 .OR. J .EQ. 5) JM = ABS(BUFID(J,2,L)) + .1           V1056280
5629.            1389             EPSI(I) = BUFCOF(J,KM,L) * VARIB(JL,I) * VARIB(JM,L) + EPSI(I)    V1056290
5630.            1390    3520   CONTINUE                                                            V1056300
5631.            1391           GO TO (2850, 3300, 2860, 3350, 2890, 3410, 1900, 2080, 2080,        V1056310
5632.                          12080, 2080, 2080, 2140, 2140, 2140, 2140, 2140, 2200, 2260, 2260,   V1056320
5633.                          2226C, 2260, 2260), I                                               V1056330
5634.            1392           END                                                                 V1056340
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES											
ABS	(R*4)	FCN	141	462	466	578	679	680	784	856	862	1069	1070	1076	1077
			1085	1372	1373	1379	1380	1388							
ANTLKK	(R*4)	ENTRY	568D												
ANTLKP		SUBR	1D												
ANTLKW	(R*4)	ENTRY	308D												
EXP	(R*4)	FCN	789	791	1221	1352									
IABS	I*4	FCN	86C	866											
PRINT		SUBR	365	378	390	400	411	421	432	442	453	481	491	505	518
SIGN	(R*4)	FCN	364	377	388	398	409	419	430	440	451	459	460	479	503
			810	820											
TABDIR		SUBR	33												
<EXIT>		SUBR	307	567	575	1061									

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES											
ALW1	(R*4)	ARRAY		17D	681*	789									
ALW2	(R*4)	ARRAY		17D	682*	791									
ALX1	(R*4)	ARRAY		15D	81*	240*	526	1205							
ALX2	(R*4)	ARRAY		15D	81*	241*	526	1204							
ALX3	(R*4)	ARRAY		15D	81*	242*	526	1322							
ALX4	(R*4)	ARRAY		15D	81*	243*	526	1321							
ALX5	(R*4)	ARRAY		15D	97*	250*	531	1209							
ALX6	(R*4)	ARRAY		15D	97*	251*	531	1208							
ALX7	(R*4)	ARRAY		15D	97*	252*	531	1334							
ALX8	(R*4)	ARRAY		15D	97*	253*	531	1333							
BUF	(R*4)	ARRAY		17C	362*	365?	375*	378?	386*	390?	396*	400?	407*	411?	417*
				421?	428*	432?	439*	442?	449*	453?	477*	481?	488*	491?	501*
				505?	514*	518?									
BUFCOF	(R*4)	ARRAY		15D	851*	920*	937*	955*	970*	1176*	1188*	1200*	1317*	1329*	1341*
				1374	1382	1384	1389								
BUFID	(R*4)	ARRAY		15D	849*	918*	935*	953*	968*	1174*	1186*	1198*	1315*	1327*	1339*
				1368	1375	1381	1386	1388?							
CLOCKO	(R*4)	ARRAY		16D	843*	854*	907								
CNT	(R*4)	ARRAY		6D	678*										
COEF	(R*4)	ARRAY		15D	51*	61*	211*	362	375	1071	1079	1081	1086		
CYCNT	(R*4)			761*	1047	1220*									
DELT	(R*4)			985*	986*	987									
DES	R*8	ARRAY		5D	26	329	331								
DT	(R*4)			707*	787*	789	790	791	986	1221	1352				
DUM	(R*4)			1065*	1067	1068*	1069?	1070?	1072*	1074	1075*	1076?	1077?	1368*	1370
				1371*	1372?	1373?	1375*	1377	1378*	1379?	1380?				
DUM1	(R*4)			880*	885*	890*	895*	902	903						
DUM2	(R*4)			881*	886*	891*	896*	902	903						
DUM3	(R*4)			882*	887*	892*	897*	903							
DUM4	(R*4)			883*	888*	893*	898*	903	905						
EPST	(R*4)	ARRAY		15D	872	873	874	875	876	903	923	930	941	942	943
				958	959	973	1204	1205	1208	1209	1214	1321	1322	1333	1334
				1346	1365*	1389*									
FF	(R*4)	ARRAY		15D	74*	212*	386	1176							
FINO	(R*4)	ARRAY		15D	1062*	1086*	1093	1106	1115	1124	1236	1249	1259	1268	
FOS	(R*4)	ARRAY		23D	764*	765*	766*	781*	792*	927*	929*	930	942*	944	945
FZ	(R*4)	ARRAY		19D	139*	142*	143*	271*	458	462	466	878	882	883	887

				888	892	893	897	898	900					
GG	(R*4)	ARRAY		150	80*	213*	396	1317						
GP	(R*4)	ARRAY		210	173*	219*	501	955						
GPCNT	(R*4)			690*	767*	958*	959*	1052						
GPV	(R*4)	ARRAY		100	776*	777*	778*	779*	780*	973*	974			
GPVV	(R*4)	ARRAY		100	184*	223*	514	970						
HEAD	(R*4)	ARRAY	PAGE	110										
I	(I*4)			45*	47	49	51	55*	57	59	61	102*	103	105*	106
				108*	109	194*	195	210*	211	228*	229	304*	305	306	326*
				327	329	331	355*	358	362	364	365?	369*	371	375	377
				378?	389*	390?	399*	400?	410*	411?	420*	421?	431*	432?	441*
				442?	452*	453?	480*	481?	491?	504*	505?	517*	518?	594*	595
				596	597	598	599	600	601	602	603	604	605	606	607
				608	609	610	611	612	613	614	616	617	618	619	620
				621	622	623	624	625	626	627	628	629	630	631	632
				633	634	635	636	637	638	639	640	641	642	643	644
				645	646	647	648	649	650	651	652	653	654	655	656
				657	658	659	660	661	662	663	664	665	666	667	668
				669	670	671	672	673	674	675	676	677	679	680	681
				682	845*	913*	923	930	939*	941	942	943	948*	963*	1062
				1065	1071	1072	1078	1079	1081	1083	1085	1086	1088	1090*	1091
				1102*	1103	1112*	1113	1121*	1122	1168*	1169*	1180*	1181*	1192*	1193*
				1233*	1234	1245*	1246	1256*	1257	1265*	1266	1365	1389	1391	
IA	(I*4)			1	29	33?	308	309	344	563	564				
IALOPT	(I*4)	ARRAY	ANTLK	120	30*	34*	35*	36	37*	189	190	191	310	341	563
				564	1363*										
IA1	(I*4)			33?	35	313*	314	564							
IBF	(I*4)	ARRAY		170	364*	365?	377*	378?	388*	390?	398*	400?	409*	411?	419*
				421?	430*	432?	440*	442?	451*	453?	459*	460*	462	479*	481?
				490*	491?	503*	505?	516*	518?						
IDOWN	(I*4)	ARRAY		130	614*	798	801*	808*	810	820					
IDUM	(I*4)			46	47	48	50	56	57	58	60	70*	71	73	76*
				77	79	86*	87	89	92*	93	95	104*	105	117*	118
				120	123*	124	126	133*	134	136	151*	152	153	155	158*
				159	160	162	169*	170	172	179*	180	181	183	354*	355
				383*	384	392*	394	404*	405	414*	415	425*	426	435*	436
				446*	447	472*	474	475	484*	485	486	497*	498	499	510*
				511	512	846*	847	914*	915	916	931*	932	933	949*	950
				951	964*	965	966	1171*	1172	1183*	1184	1195*	1196	1312*	1313
				1324*	1325	1336*	1337	1366							
IGPKEY	(I*4)	ARRAY		200	166*	167	281*	495	947						
IGPVKY	(I*4)	ARRAY		90	175*	176	282*	507	960						
IJ	(I*4)			551*	552										
IJK	(I*4)			568	569	570	571	588	589						
ILOCK	(I*4)		ANTLK	120											
ILR	(I*4)			1	29	33?	308	309	344	563	564				
ILR1	(I*4)			33?	35	314*	564								
INEW	(I*4)	ARRAY		220	616*	925	928*	930*	941*						
IOFF	(I*4)			694*	717*	831*	836*	1002	1162*	1357	1358*				
IOFF1	(I*4)	ARRAY		80	604*	717	836	1002*							
ION	(I*4)			693*	716*	830*	835*	1001	1228	1229*	1306*				
IONT	(I*4)	ARRAY		80	603*	716	835	1001*							
IOP	(I*4)	ARRAY	ANTLK	120	306*	598*	997*	1226*	1360*						
IOP12	(I*4)	ARRAY		130	110*	230*	539	1130							
IOP23	(I*4)	ARRAY		130	110*	231*	539	1140							
IOP34	(I*4)	ARRAY		130	110*	232*	539	1136							
IOP56	(I*4)	ARRAY		130	111*	233*	540	1274							
IOP67	(I*4)	ARRAY		130	111*	234*	540	1284							

IOP78	(I*4)	ARRAY	130	111*	235*	540	1280						
IOSKEY	(I*4)	ARRAY	140	147*	148	280*	470	548	910				
IPDKEY	(I*4)	ARRAY	140	113*	115	278*	423	1191	1335				
IPKEY	(I*4)	ARRAY	140	67*	68	84	277*	391	402	525	530	1167	1179	1311
			1323										
IPWMKY	(I*4)	ARRAY	140	129*	130	279*	444	543	832	840			
IPWRET	(I*4)		783*	829*	909								
IREG	(I*4)		871*	872*	873*	874*	875*	876*	877				
IRETRN	(I*4)		188*	573	593	708*							
IS	(I*4)		1	29	332	308	309	344	563	564			
IS1	(I*4)		332	35	312*	313	314	564					
ITN	(I*4)		343*	344									
ITYP	(I*4)		32*	332									
IU	(I*4)		1	29	332	308	309	344	563	564			
IUP	(I*4)	ARRAY	130	613*	802*	804	807*	810	820				
IU1	(I*4)		332	35	311*	312	313	314	564				
IWRITE	(I*4)		24	315	316*								
IXLAST	(I*4)		691*	714*	999	1215	1223*	1355*					
IXLSTI	(I*4)	ARRAY	80	601*	714	999*							
IYLAST	(I*4)		692*	715*	1000	1224*	1347	1354*					
IYLSTI	(I*4)	ARRAY	80	602*	715	1000*							
J	(I*4)		48*	49*	50*	51*	58*	59*	60*	61*	71*	72	73*	74
			77*	78	79*	80	87*	88	89*	90	93*	94	95*	96
			118*	119	120*	121	124*	125	126*	127	134*	135	136*	137
			153*	154	155*	156	160*	161	162*	163	170*	171	172*	173
			181*	182	183*	184	192*	195	196	197	198	199	200	201
			202	203	205	206	207	211	212	213	214	215	216	217
			218	219	221	222	223	225	226	269*	271	273*	274	275
			327*	328	329	360*	362	364	365?	373*	375	377	378?	384*
			386	388	390?	394*	396	398	400?	405*	407	409	411?	415*
			417	419	421?	426*	428	430	432?	436*	438	440	442?	447*
			449	451	453?	455*	458	475*	477	479	481?	486*	488	490
			491?	499*	501	503	505?	512*	514	516	518?	847*	849	851
			916*	918	920	933*	935	937	951*	953	955	966*	968	970
			1063*	1065	1071	1072	1078	1079	1081	1083	1085	1086	1172*	1174
			1176	1184*	1186	1188	1196*	1198	1200	1313*	1315	1317	1325*	1327
			1329	1337*	1339	1341	1366*	1368	1374	1375	1381	1382	1384	1386
			1388	1389										
JDUM	(I*4)		43*	45										
JK	(I*4)		859*	860*	861	865*	866*	868	870	1070*	1071	1077*	1079	1081
			1373*	1374	1380*	1382	1384							
JL	(I*4)		1083*	1086	1386*	1389								
JM	(I*4)		1084*	1085*	1086	1387*	1388*	1389						
K	(I*4)		49*	51*	59*	61*	72*	74*	78*	80*	88*	90*	94*	96*
			119*	121*	125*	127*	135*	137*	139*	142*	143*	154*	156*	161*
			163*	171*	173*	182*	184*	193*	195	196	197	198	199	200
			201	202	203	205	206	207	209*	211	212	213	214	215
			216	217	218	219	221	222	223	270*	271	310*	311	312
			313	314	361*	362	363*	364	374*	375	376*	377	385*	386
			387*	388	395*	396	397*	398	406*	407	408*	409	416*	417
			418*	419	427*	428	429*	430	437*	439	439*	440	448*	449
			450*	451	457*	458	461	462	466	476*	477	478*	479	487*
			488	489*	490	500*	501	502*	503	513*	514	515*	516	849*
			849	850*	851	855*	861*	868*	870*	878	882	883	887	888
			892	893	897	898	900	917*	918	919*	920	934*	935	936*
			937	952*	953	954*	955	967*	968	969*	970	1173*	1174	1175*
			1176	1185*	1186	1187*	1188	1197*	1198	1199*	1200	1314*	1315	1316*
			1317	1326*	1327	1328*	1329	1338*	1339	1340*	1341			

KK (I*4)
149* 150 151 154 156 157 158 161 163 164 177* 178
179 182 184 204* 205 206 207 220* 221 222 223 293*
294 295 296 299* 300 471* 473 477 479 480 484 488
490 509* 510 514 516 517 549* 550 551 552 615* 616
617 911* 912* 913 914 918 920 925 926 927 928 929
930 931 935 937 941 942 943 944 945 946 961* 962*
963 964 968 970 973 974 975

KM (I*4)
1064* 1071* 1079* 1081* 1086 1367* 1374* 1382* 1384* 1389

I (I*4)
29* 30 34 35 36 37 40 41 42 43 47 49
51 53 54 57 59 61 65 67 68 69 70 72
74 75 76 78 80 81 82 84 85 86 88 90
91 92 94 96 97 98 99 101 103 104 106 107
109 110 111 113 115 116 117 119 121 122 123 125
127 129 130 131 132 133 135 137 138 139 141 142
143 147 148 150 151 154* 156* 157 158 161* 163* 164
166 167 168 169 171 173 175 176 178 179 182* 184*
186 189 190 191 195 196 197 198 199 200 201 202
203 205 206 207 211 212 213 214 215 216 217 218
219 221 222 223 225 226 229 230 231 232 233 234
235 236 237 238 239 240 241 242 243 244 245 246
247 248 249 250 251 252 253 254 255 256 257 258
259 260 261 262 263 264 265 266 267 268 271 274
275 276 277 278 279 280 281 282 283 284 285 286
287 288 289 290 291 292 294 295 296 297 298 300
301 302 309* 310 341 354 358 362 364 368 371 375
377 381 383 386 388 393 396 398 402 404 407 409
414 417 419 423 425 428 430 435 438 440 444 446
449 451 458 459 460 462 463 466 470 473 477 479
484 488 490 495 497 501 503 507 510 514 516 523
525 526 527 530 531 532 535 537 539 540 543 544
546 548 550 552 555 558 559 563 564 569* 573 574
576 577 578 678 789 791 794 795 796 798 801 802
804 807 808 810 820 825 826 827 832 839 840 843
846 849 851 854 856 958 859 861 862 864 865 867
868 870 872 873 874 875 876 878 880 881 882 883
885 886 887 888 890 891 892 893 895 896 897 898
900 903 905 907 910 914 918 920 925 926 928 929
930 931 935 937 941 943 944 945 947 949 953 955
960 964 969 970 974 977 978 987 992 1044 1065 1071
1072 1078 1079 1081 1083 1085 1086 1091 1103 1113 1122 1130
1136 1140 1160 1167 1171 1174 1176 1179 1183 1186 1188 1191
1195 1199 1200 1203 1204 1205 1207 1208 1209 1220 1221 1227
1232 1234 1246 1257 1266 1274 1290 1294 1305 1311 1312 1315
1317 1320 1321 1322 1323 1324 1327 1329 1332 1333 1334 1335
1336 1339 1341 1352 1356 1363 1368 1374 1375 1381 1382 1384
1386 1388 1389

LC (I*4) ARRAY
130 103* 106* 109* 229* 727 728 729 730 731 732 733
734

LL (I*4)
191* 195 196 197 198 199 200 201 202 203 205 206
207 211 212 213 214 215 216 217 218 219 221 222
223 225 226 229 230 231 232 233 234 235 236 237
238 239 240 241 242 243 244 245 246 247 248 249
250 251 252 253 254 255 256 257 258 259 260 261
262 263 264 265 266 267 268 271 274 275 276 277
278 279 280 281 282 283 284 285 286 287 288 289
290 291 292 294 295 296 297 298 300 301 302

LO (I*4)
1164* 1169 1170 1181 1182 1193 1194 1211 1308*

M (I*4)
570* 709 710 711 712 713 714 715 716 717 718 719

				720	721	722	723	724	725	726	727	728	729	730	731
				732	733	734	735	736	737	738	739	740	741	742	743
				744	745	746	747	748	749	750	751	752	753	754	755
				756	757	758	759	760	761	762	763	764	765	766	767
				768	769	770	771	772	773	774	775	776	777	778	779
				780	781	782	800	806	815	816	817	818	823	824	828
				835	836	985	986	993	994	995	996	997	998	999	1000
				1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012
				1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024
				1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036
				1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048
				1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060
				1226	1360										
MMM	(I*4)			589*	591										
NB	(I*4)			369*	369										
NEW	(I*4)			359*	365?	372*	378?	382*	390?	392*	400?	403*	411?	413*	421?
				424*	432?	434*	442?	445*	453?	472*	481?	491?	496*	505?	509*
				518?											
NGO	(I*4)			576*	579										
NN	(I*4)			54*	55	107*	108	358*	360	371*	373	1063	1091*	1103*	1113*
				1122*	1234*	1246*	1257*	1266*							
NNN	(I*4)			589*	591										
NOEE	(I*4)	ARRAY		180	42*	43	104	284*	354						
NON	(I*4)	ARRAY		180	53*	54	107	285*	368						
NP	(I*4)		PAGE	110											
NTCLR	(I*4)	ARRAY		220	157*	158	294*	484	931						
NTE	(I*4)	ARRAY		130	47*	225*	358	1091	1103	1113	1122				
NTGP	(I*4)	ARRAY		200	168*	169	298*	497	949						
NTGPV	(I*4)	ARRAY		90	178*	179	300*	510	964						
NTN	(I*4)	ARRAY		130	57*	226*	371	1234	1246	1257	1266				
NTOS	(I*4)	ARRAY		220	150*	151	295*	473	550	914					
NTPDE	(I*4)	ARRAY		180	122*	123	290*	435	1195						
NTPDR	(I*4)	ARRAY		180	116*	117	291*	425	1336						
NTPWM	(I*4)	ARRAY		190	132*	133	292*	446	846						
NT1	(I*4)	ARRAY		180	69*	70	286*	383	1171						
NT2	(I*4)	ARRAY		180	75*	76	287*	393	1312						
NT3	(I*4)	ARRAY		180	85*	86	288*	404	1183						
NT4	(I*4)	ARRAY		180	91*	92	289*	414	1324						
OFF	(I*4)			686*	710*	805	834	990	994	1148*	1293*				
OFFI	(I*4)	ARRAY		80	596*	710	994*								
OFFT	(I*4)			689*	712*	991	996	1094*	1098*	1145*	1147*				
OFFTI	(I*4)	ARRAY		80	600*	712	996*								
ON	(I*4)			694*	709*	759*	799	833	989	993	1043	1149*	1292*		
ONF	(I*4)			695*	718*	1003	1161	1295*							
ONFI	(I*4)	ARRAY		80	605*	718	1003*								
ONI	(I*4)	ARRAY		80	595*	709	993*								
ONT	(I*4)			688*	711*	995	1231	1237*	1241*	1289*	1291*				
ONTI	(I*4)	ARRAY		80	599*	711	995*								
OP	(I*4)			687*	713*	997	998	1225*	1226	1361*					
OPI	(I*4)	ARRAY		90	597*	713	998*								
OPTION	(I*4)	ARRAY		180	40*	302*	558	576							
P	(R*4)			572*	652	1152	1217	1297	1349						
PD	(R*4)			568	648	785	1042	1344	1353						
PDEALL	(R*4)			1212*	1214*	1221									
PDRSE	(R*4)			1344*	1346*	1352									
PERIOD	(R*4)	ARRAY		150	131*	283*	544	854	878	900	903	905			
PEF1	(R*4)	ARRAY		150	82*	244*	527	1205							
PEF2	(R*4)	ARRAY		150	82*	245*	527	1204							

PEF3	(R*4)	ARRAY	150	82*	246*	527	1203						
PEL1	(R*4)	ARRAY	150	98*	254*	532	1209						
PEL2	(R*4)	ARRAY	150	98*	255*	532	1208						
PEL3	(R*4)	ARRAY	150	98*	256*	532	1207						
PMAX1	(R*4)		755*	1038	1216	1217*							
PMAX2	(R*4)		756*	1039	1216*								
PMIN1	(R*4)		757*	1040	1348	1349*							
PMIN2	(R*4)		758*	1041	1348*								
PQEF1	(R*4)		735*	1018	1151	1152*							
PQEF2	(R*4)		736*	1019	1151*								
PQN1	(R*4)		737*	1020	1296	1297*							
PQN2	(R*4)		738*	1021	1296*								
PP	(R*4)		568	571	572								
PRE1	(R*4)		568	574*	685*	1046	1221*	1222*	1352*	1353*			
PRF1	(R*4)	ARRAY	150	82*	247*	527	1322						
PRF2	(R*4)	ARRAY	150	82*	248*	527	1321						
PRF3	(R*4)	ARRAY	150	82*	249*	527	1320						
PRL1	(R*4)	ARRAY	150	98*	257*	532	1334						
PRL2	(R*4)	ARRAY	150	98*	258*	532	1333						
PRL3	(R*4)	ARRAY	150	98*	259*	532	1332						
PW	(R*4)	ARRAY	150	137*	218*	449	851						
PQ	(R*4)	ARRAY	70	571*	1221	1352							
QDUM1	(L*1)		1128*	1131	1133	1272*	1275	1277					
QDUM2	(L*1)		1129*	1131	1133	1134*	1137	1139	1273*	1275	1277	1278*	1281	1283
QDUM3	(L*1)		1135*	1137	1139	1279*	1281	1283						
QLC1	(L*1)		727*	1128										
QLC2	(L*1)		728*	1104	1129									
QLC3	(L*1)		729*	1110	1134									
QLC4	(L*1)		730*	1119	1135									
QLC5	(L*1)		731*	1272										
QLC6	(L*1)		732*	1247	1273									
QLC7	(L*1)		733*	1254	1278									
QLC8	(L*1)		734*	1263	1279									
QL1	(L*1)		1096*	1099*	1128									
QL2	(L*1)		1107*	1109*	1129									
QL3	(L*1)		1116*	1118*	1134									
QL4	(L*1)		1125*	1127*	1135									
QL5	(L*1)		1239*	1242*	1272									
QL6	(L*1)		1250*	1252*	1273									
QL7	(L*1)		1260*	1262*	1278									
QL8	(L*1)		1269*	1271*	1279									
QQEF	(L*1)		1141*	1143*	1144									
QQEF1	(L*1)		1131*	1133*	1141	1143								
QQEF2	(L*1)		1137*	1139*	1141	1143								
QQN	(L*1)		1285*	1287*	1288									
QQN1	(L*1)		1275*	1277*	1285	1287								
QQN2	(L*1)		1281*	1283*	1285	1287								
R	I*4	PAGE	40	110	278	40R	41R	42R	46R	49R	51R	53R	56R	59R
			61R	65R	67R	69R	72R	74R	75R	78R	80R	81R	82R	85R
			88R	90R	91R	94R	96R	97R	98R	99R	101R	110R	111R	113R
			116R	119R	121R	122R	125R	127R	129R	131R	132R	135R	137R	138R
			139R	142R	143R	147R	150R	154R	156R	157R	161R	163R	164R	166R
			168R	171R	173R	175R	179R	182R	184R	186R				
RID	(R*4)	ARRAY	150	49*	59*	195*	364?	377?	1065	1072	1078	1083	1085?	
RIDCIR	(R*4)	ARRAY	230	161*	206*	490	935							
RIDF	(R*4)	ARRAY	150	72*	196*	389?	1174							
RIDG	(R*4)	ARRAY	150	73*	197*	398?	1315							
RIDGP	(R*4)	ARRAY	210	171*	203*	503?	953							

RIDGPV	(R*4)	ARRAY	100	182*	207*	516	968						
RIDOS	(R*4)	ARRAY	230	154*	205*	479?	918						
RIDPW	(R*4)	ARRAY	150	135*	202*	451?	849						
RIDP	(R*4)	ARRAY	150	88*	198*	409?	1186						
RIDS	(R*4)	ARRAY	150	94*	199*	419?	1327						
RMORE	(R*4)	ARRAY	190	139*	141?	276*	462?	463	466?	856?	867		
PP	(R*4)	ARRAY	150	90*	214*	407	1188						
SGN	(R*4)		857*	858*	859	861	863*	864*	865	868	870	1066*	1067*
			1068	1071	1073*	1074*	1075	1079	1081	1369*	1370*	1371	1374
			1376*	1377*	1378	1382	1384						
SIDE	R*8	ARRAY	50	25	244	563	564						
SLIP	(R*4)		760*	981*	982	1045	1158	1303					
SLOFF	(R*4)		754*	1037	1158*								
SLON	(R*4)		753*	1036	1302*								
SQUARE	(R*4)		842*	906*	907*	908	1048						
SQUARN	(R*4)		908*	1049									
SS	(R*4)	ARRAY	150	96*	215*	417	1329						
T	(R*4)		568	573	606	609	610	611	612	619	628	629	638
			639	641	656	657	696	702	703	704	705	706	787
			788	814	822	827	828	839	841	843	854	907	926
			929	992	1013	1095	1100	1150	1154	1160	1219	1227	1232
			1238	1243	1294	1299	1305	1351	1356				
TAUOFF	(R*4)	ARRAY	150	99*	261*	535	1160						
TAUON	(R*4)	ARRAY	150	99*	260*	535	1305						
TAUW	(R*4)	ARRAY	150	101*	262*	537	679*	681					
TAUWD	(R*4)	ARRAY	150	101*	263*	537	680*	682					
TAU1	(R*4)	ARRAY	150	65*	236*	523	992						
TAU2	(R*4)	ARRAY	150	65*	237*	523	1227						
TAU3	(R*4)	ARRAY	150	65*	239*	523	1232						
TAU4	(R*4)	ARRAY	150	65*	239*	523	1356						
TC	(R*4)		706*	726*	1012	1166*	1203*	1204*	1205*	1221	1310*	1320*	1321*
			1322*	1352									
TCI	(R*4)	ARRAY	80	726	1012*								
TLAST	(R*4)		696*	721*	787	788*	1006						
TLIN	(R*4)		1165*	1207*	1208*	1209*	1221	1309*	1332*	1333*	1334*	1352	
TLOCK	(R*4)		752*	979*	987*	1035							
TLSTI	(R*4)	ARRAY	80	573	606*	721	1006*						
TMOD	(R*4)	ARRAY	160	878*	900*	903*	905*	907	1044				
TN	(R*4)		27	30	31	332	343						
TNEW	(R*4)	ARRAY	230	617*	926*	929	943*						
TOFF1	(R*4)		739*	1022	1153	1154*							
TOFF2	(R*4)		762*	1050	1153*								
TON1	(R*4)		740*	1023	1298	1299*							
TON2	(R*4)		763*	1051	1298*								
TOS	(R*4)	ARRAY	230	164*	296*	552	929						
TPMAX1	(R*4)		749*	1032	1218	1219*							
TPMAX2	(R*4)		774*	1059	1218*								
TPMIN1	(R*4)		750*	1033	1350	1351*							
TPMIN2	(R*4)		775*	1060	1350*								
TSMPLE	(R*4)	ARRAY	150	186*	301*	555	828	985	986				
TSMPO	(R*4)	ARRAY	170	618*	828	839*							
TWMAX1	(R*4)		770*	813	814*	817	1055						
TWMAX2	(R*4)		771*	813*	818	1056							
TWMIN	(R*4)		773*	822*	824	1058							
T1	(R*4)		702*	722*	992	1008	1095*	1100*					
T1I	(R*4)	ARRAY	80	609*	722	1008*							
T2	(R*4)		703*	723*	1009	1150*	1160	1227					
T2I	(R*4)	ARRAY	80	610*	723	1009*							

XDOFF	(R*4)		741*	1324	1155*							
XDON	(R*4)		742*	1025	1300*							
YN	(R*4)		337	35								
ZBR	(R*4)	ARRAY	190	142*	143*	275*	462	961	868	870		
ZID	(R*4)	ARRAY	190	142*	143*	274*	459?	460?	858	859	862?	864	865
ZI	(R*4)	ARRAY	150	138*	264*	546	876	880				
Z2	(R*4)	ARRAY	150	138*	265*	546	875	881	885			
Z3	(R*4)	ARRAY	150	139*	266*	546	874	886	890			
Z4	(R*4)	ARRAY	150	138*	267*	546	873	891	895			
Z5	(R*4)	ARRAY	150	138*	268*	546	872	896				
1			139*									
2			142*	462	466							
3			143*	462	466							

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES									
10	28	FMT	27									
20	39		36									
30	44	FMT	42	46	53	56	67	69	75	85	91	116	122	132
			150	157	168	178								
40	49		48									
50	51		50									
60	52		45									
70	59		58									
80	61		60									
90	62		55									
100	63	FMT	49	59	65	72	78	88	94	119	125	135	154	161
			171	182										
110	64	FMT	51	61	74	80	90	96	121	127	137	138	156	163
			173	184										
120	66	FMT	41	131	164	186								
130	72		71									
140	74		73									
150	78		77									
160	80		79									
170	83	FMT										
180	84		68									
190	88		87									
200	90		89									
210	94		93									
220	96		95									
230	99		84									
240	100	FMT	81	97	99	101						
250	103		102									
260	106		105									
270	109		108									
280	112	FMT	110	111								
290	114	FMT	43	113	129	147	166	175				
300	119		118									
310	121		120									
320	125		124									
330	127		126									
340	128		115									
350	135		134									
360	137		136									
370	140	FMT	139									

380	144	FMT	142	143		
390	145	FMT	82	98		
400	146		130	141		
410	154		153			
420	156		155			
430	161		160			
440	163		162			
450	165		149	152	159	
460	166		148			
470	171		170			
480	173		172			
490	174		167			
500	182		181			
510	184		183			
520	185		177	180		
530	196		176			
540	187		31	38		
550	195		194			
560	207		204			
570	208		193			
580	211		210			
590	223		220			
600	224		209			
610	227		192			
620	229		228			
630	272		269	270		
640	275		273			
650	296		293			
660	300		299			
670	303		189	190		
680	306		304			
690	319	FMT	318	337		
700	321	FMT	320	323	335	336
710	331		328			
720	332	FMT	329			
730	333	FMT	331			
740	334		326	330		
750	338	FMT	327			
760	339	FMT	324			
770	340	FMT	325			
780	341		315			
790	345	FMT	344			
800	347	FMT	346			
810	349	FMT	348			
820	351	FMT	350			
830	353	FMT	352			
840	357	FMT	356	370	456	
850	362		361			
860	364		363			
870	366		360			
880	367		355			
890	375		374			
900	377		376			
910	379		373			
920	380		369			
930	386		385			
940	388		387			
950	391		384			

279

960	396		395		
970	398		397		
980	401		354		
990	402		381		
1000	407		406		
1010	409		408		
1020	412		405		
1030	417		416		
1040	419		418		
1050	422		415		
1060	423		402		
1070	428		427		
1080	430		429		
1090	433		426		
1100	438		437		
1110	440		439		
1120	443		436		
1130	444		423		
1140	449		448		
1150	451		450		
1160	454		447		
1170	464	FMT	463		
1180	466		461		
1190	467	FMT	462	466	
1200	468	FMT	458		
1210	469		457	465	
1220	470		444		
1230	477		476		
1240	479		478		
1250	482		475		
1260	488		487		
1270	490		489		
1280	492		486		
1290	493		471	474	485
1300	494	FMT	483		
1310	495		470		
1320	501		500		
1330	503		502		
1340	506		499		
1350	507		495	498	
1360	514		513		
1370	516		515		
1380	519		512		
1390	520		508	511	
1400	521		507		
1410	522	FMT	521		
1420	524	FMT	523		
1430	528	FMT	526		
1440	529	FMT	527		
1450	530		525		
1460	533	FMT	531		
1470	534	FMT	532		
1480	535		530		
1490	536	FMT	535		
1500	538	FMT	537		
1510	541	FMT	539		
1520	542	FMT	540		
1530	545	FMT	544		

1540	547	FMT	546			
1550	548		543			
1560	553	FMT	552			
1570	554		549	550		
1580	555		548			
1590	556	FMT	555			
1600	557	FMT	317	342		
1610	560	FMT	559			
1620	561	FMT	558			
1630	562		341			
1640	565	FMT	563			
1650	566	FMT	564			
1660	576		573			
1670	580		579			
1680	583		579			
1690	586		579			
1700	588		579			
1710	592		582	585	587	
1720	594		593			
1730	617		615			
1740	683		594			
1750	709		593			
1760	784					
1770	798		794			
1780	801		797	798		
1790	804		796			
1800	807		795	804		
1810	809		803			
1820	820		810			
1830	825		819	820		
1840	833		909			
1950	838		828			
1860	845		841			
1870	849		848			
1880	851		850			
1890	852		847			
1900	854		1391			
1910	870		867			
1920	871		856	862	869	
1930	878		877			
1940	880		877			
1950	885		877			
1960	890		877			
1970	895		877			
1980	900		877			
1990	902		884	889	894	899
2000	905		902			
2010	906		832	879	901	904
2020	907					
2030	910		840	844		
2040	912		946			
2050	918		917			
2060	920		919			
2070	921		916			
2080	923		1391			
2090	925		923			
2100	927		924	925		
2110	935		934			

2120	937	936										
2130	939	933										
2140	941	1391										
2150	946	915	932									
2160	947	910										
2170	953	952										
2180	955	954										
2190	956	951										
2200	958	1391										
2210	960	947	950									
2220	962	975										
2230	968	967										
2240	970	969										
2250	971	966										
2260	973	1391										
2270	975	965										
2280	976	960										
2290	984	982										
2300	988	983										
2310	990	989										
2320	991	990	1357									
2330	992	991	1097	1101								
2340	993	837	992	1089	1146	1161	1227	1230	1232	1290	1356	1359	1362
		1364										
2350	1062	1092	1104	1114	1123	1235	1247	1258	1267			
2360	1072	1069										
2370	1081	1078										
2380	1082	1076	1080									
2390	1087	1063										
2400	1090	991										
2410	1093	1088										
2420	1094	1093										
2430	1098	1093										
2440	1102	992										
2450	1106	1088										
2460	1107	1106										
2470	1109	1106										
2480	1110	1105	1108									
2490	1112	1110										
2500	1115	1088										
2510	1116	1115										
2520	1118	1111	1115									
2530	1119	1117										
2540	1121	1119										
2550	1124	1088										
2560	1125	1124										
2570	1127	1120	1124									
2580	1129	1126										
2590	1131	1130										
2600	1133	1131										
2610	1134	1132										
2620	1137	1136										
2630	1139	1136										
2640	1140	1139										
2650	1141	1140										
2660	1143	1140										
2670	1144	1142										
2680	1147	1144										

2690	1160	834	990	1159	1307
2700	1161	1160			
2710	1162	1161			
2720	1164	1160			
2730	1167	1319			
2740	1174	1173			
2750	1176	1175			
2760	1177	1172			
2770	1179	1167	1206	1331	
2780	1186	1185			
2790	1188	1187			
2800	1189	1184			
2810	1191	1179	1210	1343	
2820	1198	1197			
2830	1200	1199			
2840	1201	1196			
2850	1203	1391			
2860	1207	1391			
2870	1211	1191	1335		
2880	1214	1391			
2890	1215	1213			
2900	1221	1215			
2910	1228	1227			
2920	1229	1228			
2930	1231	1228			
2940	1232	1231	1240	1244	
2950	1233	1231			
2960	1236	1088			
2970	1237	1236			
2980	1241	1236			
2990	1245	1232			
3000	1249	1088			
3010	1250	1249			
3020	1252	1249			
3030	1254	1248	1251	1253	
3040	1256	1254			
3050	1259	1088			
3060	1260	1255	1259		
3070	1262	1259			
3080	1263	1261			
3090	1265	1263			
3100	1268	1088			
3110	1269	1268			
3120	1271	1264	1268		
3130	1272	1270			
3140	1275	1274			
3150	1277	1274			
3160	1278	1276			
3170	1281	1280			
3180	1283	1280			
3190	1284	1282			
3200	1285	1284			
3210	1287	1284			
3220	1288	1286			
3230	1291	1289			
3240	1305	833	989	1163	1304
3250	1306	1305			
3260	1309	1305			

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3270    1315                1314
3280    1317                1316
3290    1319                1313
3300    1320                1391
3310    1323                1311
3320    1327                1326
3330    1329                1328
3340    1330                1325
3350    1332                1391
3360    1335                1323
3370    1339                1339
3380    1341                1340
3390    1342                1337
3400    1344                1211
3410    1346                1391
3420    1347                1345
3430    1352                1347
3440    1357                1356
3450    1358                1357
3460    1360                 785
3470    1363                 786
3480    1365                 853    922    940    957    972   1170   1178   1182   1190   1194   1202
3490    1375                1372
3500    1384                1381
3510    1385                1379   1383
3520    1390                1366
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TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION

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  MTS          INTERNAL       ****  F T N T I O Y ****
LINE NO.       STMT NO.       INPUT LISTING

5635.                     C                                                                    V1056350
5636.                     C    *****   SUBROUTINE PRINT                                        V1056360
5637.                     C                                                                    V1056370
5638.                1            SUBROUTINE PRINT(BUF, IBF, I, J, NEW)                        V1056380
5639.                2            INTEGER R, WR                                                V1056390
5640.                3            LOGICAL*1 JYMB(130,3)                                        V1056400
5641.                4            DIMENSION BUF(5), DESCR(26,6)                                V1056410
5642.                5            DIMENSION IBF(4)                                             V1056420
5643.                6            COMMON /PAGE/ NP, HEAD(20), R, WR                            V1056430
5644.                7            DATA DESCR /8*'INEQ', 4*'EPSI', 'PORS', 'PEFA', 'PULS', 'ONE-',  V1056440
5645.                            1     'ONE-', 'ONE-', 'ONE-', 'ONE-', 'GENE', 5*'GEN.', 8*'UALI',  V1056450
5646.                            2     4*'LICN', 'E-MC', 'LL-M', 'S-WI', 'SHOT', 'SHOT', 'SHOT',    V1056460
5647.                            3     'SHOT', 'SHOT', 'RAL ', 5*' PUR', 8*'TY F', ' 1: ', ' 2: ',  V1056470
5648.                            4     ' 3: ', ' 4: ', 'OULA', 'ODUL', 'CTH ', ' 1: ', ' 2: ',      V1056480
5649.                            5     ' 3: ', ' 4: ', ' 5: ', 'PURP', 5*'P. V', 8*'XPRE', 4*'    ',V1056490
5650.                            6     'TOR:', 'ATOR', 'MODU', 5*'    ', 'CSE ', 5*'ARIB', 8*'SSIC',V1056500
5651.                            7     5*'    ', ':   ', 'LATO', 5*'    ', 'COUN', '. 1:', '. 2:',   V1056510
5652.                            8     '. 3:', '. 4:', '. 5:', 8*'N:  ', 6*'    ', 'R:  ', 5*'    ',V1056520
5653.                            9     'TER:', 5*'    '/                                           V1056530
5654.                8            DATA JYMB /75*' ', 25*'0', 5*' ', 25*'G', 70*' ', 5*'P', 25*'S',  V1056540
5655.                            1     5*'G', 25*'P', 40*'C', 5*'H', 5*'G', 5*'R', 5*'S', 5*'W', 5* V1056550
5656.                            2     'V', 5*'W', 5*'1', 5*'2', 5*'3', 5*'4', 5*'5', 5*'P', 25*'V'/V1056560
5657.                9            N = 5 * (I - 1) + J                                          V1056570
5658.               10            IMK = 1                                                      V1056580
5659.               11            IF (IABS(IBF(3)) .GE. 1) IMK = 2                             V1056590
5660.               12            IF (IABS(IBF(3)) .GE. 1 .AND. IABS(IBF(4)) .GE. 1) IMK = 3   V1056600
5661.               13            IF (NEW .NE. 1) GO TO 20                                     V1056610
5662.               14            WRITE (WR,10) (DESCR(I,M),M=1,6)                             V1056620
5663.               15            IF (I .LE. 8) WRITE (WR,80) I                                V1056630
5664.               16         10 FORMAT ('-', 6A4)                                            V1056640
5665.               17            WRITE (WR,70)                                                V1056650
5666.               18         20 GO TO (30, 40, 50), IMK                                      V1056660
5667.               19         30 WRITE (WR,130) (JYMB(N,M),M=1,3), J, J, BUF(I), IBF(I)       V1056670
5668.               20            IDUM = IABS(IBF(2))                                          V1056680
5669.               21            IF (J .EQ. 4 .OR. J .EQ. 5) WRITE (WR,100) IDUM              V1056690
5670.               22            IF (IBF(2) .LT. -1) WRITE (WR,110)                           V1056700
5671.               23            GO TO 60                                                     V1056710
5672.               24         40 WRITE (WR,120) (JYMB(N,M),M=1,3), J, J, (BUF(K),K=1,2), IBF(1),  V1056720
5673.                             IBF(3), BUF(4)                                               V1056730
5674.               25            IDUM = IABS(IBF(2))                                          V1056740
5675.               26            IF (J .EQ. 4 .OR. J .EQ. 5) WRITE (WR,100) IDUM              V1056750
5676.               27            IF (IBF(2) .LT. -1) WRITE (WR,110)                           V1056760
5677.               28            GO TO 60                                                     V1056770
5678.               29         50 WRITE (WR,90) (JYMB(N,M),M=1,3), J, J, (BUF(K),K=1,3), IBF(1),   V1056780
5679.                             IBF(3), IBF(4), (BUF(K),K=4,5)                               V1056790
5680.               30            IDUM = IABS(IBF(2))                                          V1056800
5681.               31            IF (J .EQ. 4 .OR. J .EQ. 5) WRITE (WR,100) IDUM              V1056810
5682.               32            IF (IBF(2) .LT. -1) WRITE (WR,110)                           V1056820
5683.               33         60 NEW = 0                                                      V1056830
5684.               34            RETURN                                                       V1056840
5685.               35         70 FORMAT (' ')                                                 V1056850
5686.               36         80 FORMAT ('+', T25, I1)                                        V1056860
5687.               37         90 FORMAT (' ', T2, 3A1, '(', I1, ')', T20, 'COEFFICIENT(', I1, ')',  V1056870
5688.                            1        T41, F10.4, T54, F10.4, T66, F10.4, T82, I2, T93, I3, T103,V1056880
5689.                            2        I3, T112, F8.3, T122, F8.3)                          V1056890
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   MTS          INTERNAL       **** F T N T I C Y ****
LINE NO.        STMT NO.       INPUT LISTING

5689.             38       100 FORMAT ('+', T84, ',', I3)                                                    V1056900
5691.             39       110 FORMAT ('+', T98, 'AND')                                                      V1056910
5692.             40       120 FORMAT (' ', T2, 3A1, '(', I1, ')', T20, 'COEFFICIENT(', I1, ')',            V1056920
5693.                            1       T41, F10.4, T54, F10.4, T82, I2, T93, I3, T112, F8.3)             V1056930
5694.             41       130 FORMAT (' ', T2, 3A1, '(', I1, ')', T20, 'COEFFICIENT(', I1, ')',            V1056940
5695.                            1       T41, F10.4, T82, I2)                                              V1056950
5696.             42           END                                                                           V1056960
```

*** SUBPROGRAM DICTIONARY ***

NAME	TYPE	ATTR	REFERENCES
IABS	I*4	FCN	11 12 20 25 30
PRINT		SUBR	10
<EXIT>		SUBR	34

*** VARIABLE DICTIONARY ***

NAME	TYPE	ATTR	COMMON	REFERENCES
BUF	(R*4)	ARRAY		1 40 19 24 29
DESCR	(R*4)	ARRAY		40 7 14
HEAD	(R*4)	ARRAY	PAGE	6C
I	(I*4)			1 9 14 15
IBF	(I*4)	ARRAY		1 5D 11? 12? 19 20? 22 24 25? 27 29 30? 32
IDUM	(I*4)			20* 21 25* 26 30* 31
IMK	(I*4)			10* 11* 12* 18
J	(I*4)			1 9 19 21 24 26 29 31
JYMB	L*1	ARRAY		3C 8 19 24 29
K	(I*4)			24* 29*
M	(I*4)			14* 19* 24* 29*
N	(I*4)			9* 19 24 29
NEW	(I*4)			1 13 33*
NP	(I*4)		PAGE	6C
R	I*4		PAGE	2C 6C
WP	I*4		PAGE	2C 6C 14W 15W 17W 19W 21W 22W 24W 26W 27W 29W 31W 32W

*** STATEMENT LABEL DICTIONARY ***

LABEL	DEFN	TYPE	REFERENCES
10	16	FMT	14
20	18		13
30	19		18
40	24		18
50	29		18
60	33		23 28
70	35	FMT	17
80	36	FMT	15
90	37	FMT	29
100	38	FMT	21 26 31
110	39	FMT	22 27 32
120	40	FMT	24
130	41	FMT	19

TYPES: I=INTEGER, R=REAL, L=LOGICAL, C=COMPLEX, GEN.=GENERIC, N.L.=NAMELIST, FMT=FORMAT
TYPES ENCLOSED WITHIN PARENTHESES INDICATE IMPLICIT DECLARATION
ATTRIBUTES: SUBR=SUBROUTINE, FCN=FUNCTION, S.F.=STATEMENT FUNCTION
REFERENCES: *=VALUE CHANGED, ?=SUBPROGRAM ARGUMENT, D=DEFINED, E=EQUIVALENCE, C=COMMON, R=READ, W=WRITE, M=MOTION

INDEX

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