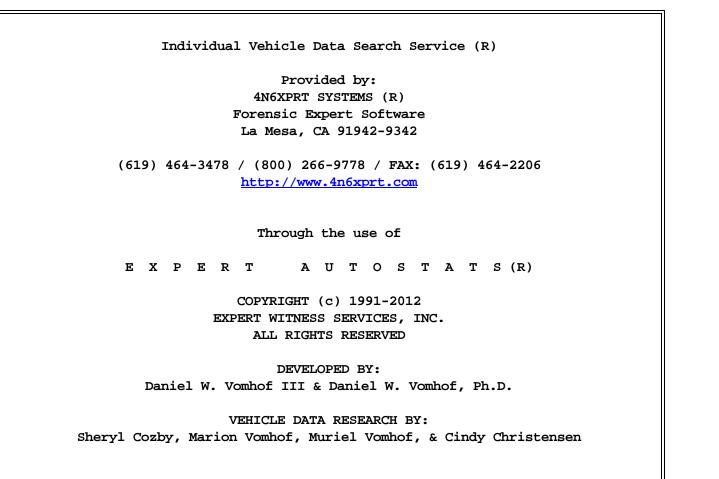
Individual Vehicle dimensions were obtained through the use of the Expert AutoStats(R) program.

The Expert AutoStats(R) program contains a multitude of vehicle dimensions and specifications on over 42,000 different vehicles and 203 different manufacturers spanning more than 70 years.

While every attempt has been made to ensure accurate data, these dimensions are meant to be used as first approximations. Some measurements are dependent on such factors as tire and rim sizes, tire inflation pressure and wear, suspension system condition, bumper type and style, and other manufacturing variations from vehicle to vehicle.

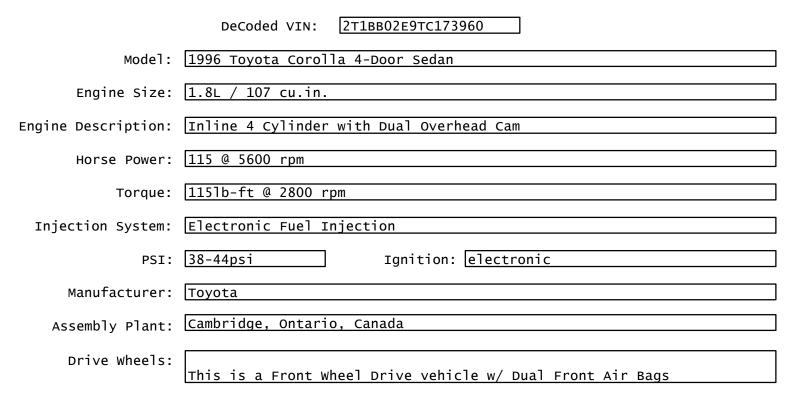
Whenever feasible, the vehicle in question or an exemplar vehicle should be measured to verify data important to your case.



Expert VIN DeCoder®

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Version Number 3.1.0.3



The First through Third characters (2T1) indicate a Toyota Car made in Canada
The Fourth character (B) indicates a 4-Door Sedan
The Fifth character (B) indicates the OEM engine: 1.8L / 107 cu.in., L4,DOHC
The Sixth and Eighth characters (OE) indicate a Corolla
The Seventh character (2) indicates Dual Front Air Bags
The Ninth character (the check digit) is entered as 9.
The VIN appears Valid, the calculated value is 9.
The Tenth character (T) indicates the model year 1996
The Eleventh character (C) indicates the vehicle was made in the assembly plant in

The Twelfth through Seventeenth characters (173960) indicate the Serial Number and are unique to this vehicle.

Cambridge, Ontario, Canada

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PROVIDED BY: 4N6XPRT Systems 8387 University Avenue La Mesa CA 91941

7/24/2012

1996 TOYOTA COROLLA 4 DOOR SEDAN

| Curb Weight: Curb Weight Distribution - Front: | 2315 lbs. | | 050 kg. 10 % |
|--|--|--|--|
| Gross Vehicle Weight Rating: | 3505 1bs. | 15 | 5 90 kg. |
| Number of Tires on Vehicle: Drive Wheels: | 4 FRONT | | |
| Horizontal Dimensions Total Length | Inches | Feet 14.33 | Meters |
| wheelbase: | 97 | 8.08 | 2.46 |
| Front Bumper to Front Axle: Front Bumper to Front of Front Well: Front Bumper to Front of Hood: Front Bumper to Base of Windshield: Front Bumper to Top of Windshield: | 33 20 6 46 73 | 2.75 1.67 0.50 3.83 6.08 | 0.84 0.51 0.15 1.17 1.85 |
| Rear Bumper to Rear Axle: Rear Bumper to Rear of Rear Well: Rear Bumper to Rear of Trunk: Rear Bumper to Base of Rear Window: | 42 27 6 23 | 3.50 2.25 0.50 1.92 | 1.07 0.69 0.15 0.58 |
| Width Dimensions Maximum Width: Front Track: Rear Track: | 66 58 57 | 5.50 4.83 4.75 | 1.68 1.47 1.45 |
| Vertical Dimensions Height: Ground to - | 54 | 4.50 | 1.37 |
| Front Bumper (Top) Headlight - center Hood - top front: Base of Windshield Rear Bumper - top: Trunk - top rear: Base of Rear Window: | 21 25 29 36 21 37 39 | 1.75 2.08 2.42 3.00 1.75 3.08 3.25 | 0.53 0.64 0.74 0.91 0.53 0.94 0.99 |

1996 TOYOTA COROLLA 4 DOOR SEDAN

| Interior Dimensions Front Seat Shoulder Width Front Seat to Headliner Front Leg Room - seatback to floor (max) | Inches 54 39 42 | Feet Meters 4.50 1.37 3.25 0.99 3.50 1.07 |
|---|--|---|
| Rear Seat Shoulder Width Rear Seat to Headliner Front Leg Room - seatback to floor (min) | 54 37 33 | 4.501.373.080.942.750.84 |
| Seatbelts: <u>3pt - front and rear</u> Airbags: FRONT SEAT AIRBAGS | | |
| Steering Data Turning Circle (Diameter) Steering Ratio: <u>22.70:1</u> Wheel Radius: Tire Size (OEM): <u>175-65R14</u> | <u> 384</u> | 32.00 9.75 1.00 0.30 |
| Acceleration & Braking Information Brake Type: FRONT DISC - REAR DRUM ABS System: ABS UNKNOWN | | |
| Braking, 60 mph to 0 (Hard pedal, no skid, dr d = 186.0 ft t = 4.2 sec a Acceleration: | ry pavement): = -20.8 ft/sec ² | G-force = -0.65 |
| 0 to 30mph $t = 3.5$ sec a 0 to 60mph $t = 10.2$ sec a | = 12.6 ft/sec ² = 8.6 ft/sec ² = ft/sec ² | G-force = 0.27 |
| Transmission Type: 5spd MANUAL | | |
| Notes: Federal Bumper Standard Requirements: This vehicles Rated Bumper Strength: | 2.5 mph 5 mph | |

N.S.D.C = 1995 - 1997

1996 TOYOTA COROLLA 4 DOOR SEDAN

| Other Information | | |
|--|------|---------------------------------------|
| Tip-Over Stability Ratio = | 1.36 | Stable |
| NHTSA Star Rating (calculated) | | **** |
| Center of Gravity (No Load): | | |
| Inches behind front axle | = | 38.80 |
| Inches in front of rear axle | = | 58.20 |
| Inches from side of vehicle | = | 33.00 |
| Inches from ground | = | 21.20 |
| Inches from front corner | = | 79.02 |
| Inches from rear corner | = | 105.49 |
| Inches from front bumper | = | 71.80 |
| Inches from rear bumper | = | 100.20 |
| Moments of Inertia Approximations (No Load): | | |
| Yaw Moment of Inertia | = | 1178.45 lb*ft*sec ² |
| Pitch Moment of Inertia | = | 1142.85 lb*ft*sec ² |
| Roll Moment of Inertia | = | 266.70 lb*ft*sec ² |
| Front Profile Information | | |
| Angle Front Bumper to Hood Front | = | 53.1 deg |
| Angle Front of Hood to Windshield Base | = | 9.9 deg |
| Angle Front of Hood to Windshield Top | = | 18.9 deg |
| Angle of Windshield | = | 30.7 deg |
| Angle of Steering Tires at Max Turn | = | 28.9 deg |

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

| $V(mph) = \sqrt{(30 * CF * MID)}$ | | |
|---|---|-------|
| KE Equivalent Speed (Front/Rear/Side) | = | 21 CF |
| Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY (Tested for Rear/Side Impact only) | = | 27 CF |

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

NHTSA Crash Test #1763

1993 TOYOTA COROLLA

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS 8387 UNIVERSITY AVENUE LA MESA CA 91941-3842 11R-030201SC02301

Copyright 2011 - All Rights Reserved 4N6XPRT Systems | 8387 University Avenue | La Mesa, CA 91942 | USA (800) 266-9778 | (619) 464-3478 | FAX: (619) 464-2206 | Email: 4n6@4n6xprt.com

Sister/Clone database reader

You entered: 1996 TOYOTA COROLLA

The Sister/Clone Vehicle Year/Model Interchange list indicates the following are Similar Models

| Year Range | Make | Model | Body Styles | Wheelbase |
|-------------------------|--------|---------|----------------|-----------|
| 1993 - 1997 Remarks: | GEO | PRIZM | | 97.1 |
| 1993 - 1997 Remarks: | ΤΟΥΟΤΑ | COROLLA | 2D, 3D, 4D, SW | 102.4 |

The data contained in the database has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. 4N6XPRT Systems® has made no changes to this data, and has only provided for distribution of this data free of charge. 4N6XPRT Systems® makes no warranties, either expressed or implied, with respect to this data, its quality, performance, merchantability, or fitness for any particular purpose. The entire risk as to its quality and performance is with the user. In no event will 4N6XPRT Systems® be liable for direct, indirect, incidental, or consequential damages resulting from any data presented here, even if 4N6XPRT Systems® has been advised of the possibility of such damages. The user must agree to assume full responsibility for any decisions which are based, in whole or in part, upon information obtained by using this data. As previously stated, the data has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. Mr. Anderson does not in any way guarantee the accuracy of the data. Some of the listed similarities are based on his own estimates or memory. Most of the data are pulled from specification tables which may contain inaccuracies of their own. Use common sense - if something seems wrong, check it (and if it is wrong, let him know!).

If you have suggestions, corrections, etc., you should contact Greg Anderson at Scalia Safety Engineering, 521 East Washington Avenue, Suite 200, Madison, WI 53703-2914, (608) 256-0820, FAX (608) 256-0212, E-mail: greganderson@cs.com.

Test Information

| Test # 1763 | | NHTSA Test F | Reference Guide Version # | 2 | | | | | | |
|----------------------|------------------|--|---------------------------|-----------------|----------|-------------|--------|--|--|--|
| Test Date 1992-09-3 | 0 | | Contract # | DTNH22-90- | C-01003 | | | | | |
| Contract/Study Title | FY93 VEHIC | LE SAFETY COMP | LIANCE FRONTAL BARR | IER IMPACT TE | ST PROGR | RAM | | | | |
| Test Objective(s) | TO OBTAIN | TO OBTAIN VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT PERFORMANCE | | | | | | | | |
| Test Type | FMVSS 208 | OCCUPANT CRA | SH PROTECTION |] Configuration | VEHICLE | INTO BARRIE | R | | | |
| Impact Angle | 0 | | Side Impact Poir | nt 0 | mm | 0.0 | inches | | | |
| | | | Offset Distance | e 0 | mm | 0.0 | inches | | | |
| | | | Closing Spee | d 47.3 | Km/Hr | 29.39 | MPH | | | |
| Test Performer | CALSPAN | | | | | | | | | |
| Test Reference # | RUN 1218 | | | | | | | | | |
| Test Track Surface | CONCRETE | | Conditior | DRY | | | | | | |
| Ambient Temperature | 11 C | 51.8 F | Total Number of Curve | s 25 | | | | | | |
| Data Recorder Type | DIGITAL TA | PE RECORDER | | Data Link | UMBILIO | CAL CABLE | | | | |
| Test Commentary | NO COMME | NTS | | | | | | | | |

Fixed Barrier Information

| Barrier Type | RIGID | Pole Barrier Diameter 0 | mm | 0 | inches |
|--------------------|--------------------------|--------------------------------|----|---|--------|
| Barrier Shape | FLAT BARRIER | |] | | |
| Barrier Commentary | 10*12*5 FT. CONCRETE BAR | RIER | | | |

1993 TOYOTA COROLLA LEFT FRONT SEAT OCCUPANT

| Test # | 1763 | | |
|------------|---------------------------------|---------------------------|--|
| Vehicle # | 1 | | Sex MALE |
| Location | LEFT FRONT SE | AT | Age 0 |
| Position | CENTER POSITI | ON | Height 0 mm 0.0 inches |
| Туре | HYBRID III DUMI | MY | Weight 0.0 kg 0 pounds |
| Size | 50 PERCENTILE | | |
| Cali | ibration Method | | |
| | nt Manufacturer | MFG:HUMANOID S | S/N:290 |
| • | ant Modification | NO COMMENTS | |
| | pant Description | NO COMMENTS | |
| Occupa | ant Commentary | CNTRH1,CNTRC1 - | - AIR BAG. |
| Head to - | | Head | ad |
| Windshie | elder Header 300 | mm 11.8 | inches Head Injury Criteria (HIC) 164 |
| | WindShield 475 | mm 18.7 | inches HIC Lower Time Interval (ms) 59.4 |
| | Seatback 0 | mm 0.0 | inches HIC Upper Time Interval (ms) 95.28 |
| | Side Header 193 | 3 mm 7.6 | inches |
| | Side Window 297 | <u>mm 11.7</u> | inches |
| Neck to Se | atback 0 r | mm 0.0 inches | s |
| | First Contact R | egion (Head) | ER |
| S | Second Contact Re | egion (Head) | |
| | | | |
| | | <u>Ches</u> | <u>ist</u> |
| Chest to - | | | |
| | | nm 20.0 inches | |
| Steering \ | | nm 11.3 inches | |
| | | nm 0.0 inches | |
| | Severity Index 32 auma Index | 1 | Pelvic Peak Lateral Acceleration (g's) Thorax Peak Acceleration (g's) 46.2 |
| | | Belt Peak Load | Thorax Peak Acceleration (g's) 46.2 Newtons 0.0 pound Force |
| | | Belt Peak Load | Newtons 0.0 pound Force |
| First Co | | est/Abdomen) OTHEI | |
| | | est/Abdomen) NONE | |
| | Sinder Region (On | | |
| | | | |
| Knees to | | nm 6.1 inches | |
| | | 933 Newtons | |
| Right Femi | | 184 Newtons | |
| | First Contact F | | IPANEL |
| | Second Contact R | egion (Legs) | |

1993 TOYOTA COROLLA LEFT FRONT SEAT OCCUPANT

| Test # | 1763 | | | | | | |
|------------------|------------|------------|------------------------|----------|---------------|------------|---|
| Vehicle # | 1 | | | Sex | MALE | | |
| Location | LEFT F | RONT SE | AT | Age | 0 | | |
| Position | CENTE | | ON | Height | 0 mm | 0.0 inches | |
| Туре | HYBRI | d III dumn | ЛY | Weight | 0.0 kg | 0 pounds | 6 |
| Size | 50 PEF | RCENTILE | |] | | | |
| Cali | ibration I | Method | HYBRID III | | | | |
| Occupa | nt Manu | facturer | MFG:HUMANOID S/N:29 | 0 | | | |
| Occupa | ant Mod | ification | NO COMMENTS | | | | |
| Occu | pant De | scription | NO COMMENTS | | | | |
| Occupa | ant Com | mentary | CNTRH1, CNTRC1 - AIR I | BAG. | | | |
| | | | | | | | |
| | | | Restraints | <u>8</u> | | | |
| Restrai | nt # 1 | FRONTAL | . AIRBAG | | | | |
| Mounte | ed [| | | | | | |
| Deploy | ment | DEPLOYE | ED PROPERLY | | | | |
| Restrai | nt Comn | nentary | NO COMMENTS | | | | |
| Restrai | nt# 2 | STR. WHE | FI-FA | | | | |
| | i | | | | | | |
| | | ΝΟΤ ΔΡΡ | LICABLE | | | | |
| Mounte Deploy | | NOT APP | | | | | |

Restraint Commentary **NO COMMENTS**

1993 TOYOTA COROLLA RIGHT FRONT SEAT OCCUPANT

| Test # | 1763 | | |
|------------|--------------------------|--|--|
| Vehicle # | 1 | Sex MALE | |
| Location | RIGHT FRONT S | SEAT Age 0 | |
| Position | CENTER POSITI | TON Height 0 mm 0.0 inches | |
| Туре | HYBRID III DUMI | IMY Weight 0.0 kg 0 pounds | |
| Size | 50 PERCENTILE | E | |
| Cal | ibration Method | | |
| Occupa | nt Manufacturer | MFG:HUMANOID S/N:313 | |
| • | ant Modification | | |
| | pant Description | | |
| Occup | ant Commentary | NO COMMENTS | |
| Head to - | | Head | |
| Windshie | elder Header 323 | 3 mm 12.7 inches Head Injury Criteria (HIC) 326 | |
| | WindShield 508 | 8 mm 20.0 inches HIC Lower Time Interval (ms) 64.92 | |
| | Seatback 0 | mm 0.0 inches HIC Upper Time Interval (ms) 100.8 | |
| | Side Header 198 | | |
| | Side Window 300 | | |
| Neck to Se | | mm 0.0 inches | |
| | First Contact Re | | |
| S | Second Contact Re | Region (Head) | |
| | | Chest | |
| Chest to - | | | |
| | | mm 21.2 inches Arm to Door 99 mm 3.9 inches | |
| Steering | | mm 0.0 inches Hip to Door 170 mm 6.7 inches | |
| | | mm 0.0 inches | |
| | Severity Index 29 | | |
| Thoracic T | rauma Index | Thorax Peak Acceleration (g's) 41.5 | |
| | • | Belt Peak Load Newtons 0.0 pound Force | |
| | | Belt Peak Load Newtons 0.0 pound Force | |
| | - (| nest/Abdomen) | |
| Second C | ontact Region (Che | nest/Abdomen) | |
| | | | |
| Knees to | | mm 6.5 inches Knees to Seatback 0 mm 0.0 inches | |
| Left Fem | ur Peak Load 2 | 2793 Newtons -627.9 pounds Force | |
| Right Fem | ur Peak Load -3 9 | 3932 Newtons -884.0 pounds Force | |
| | | Region (Legs) DASHPANEL | |
| | Second Contact R | Region (Legs) | |

1993 TOYOTA COROLLA RIGHT FRONT SEAT OCCUPANT

| Test # | 1763 | | | | | | |
|-----------|---------------------------|---------------------|----------|---------------|----------------|---|--|
| Vehicle # | 1 | | Sex | MALE | |] | |
| Location | RIGHT FRONT S | SEAT | Age | 0 | | | |
| Position | CENTER POSIT | ION | Height | 0 mm | 0.0 inches | | |
| Туре | HYBRID III DUM | MY | Weight | 0.0 kg | 0 pound | S | |
| Size | 50 PERCENTILE | | | | | | |
| Cal | bration Method | HYBRID III | | | | | |
| Occupa | nt Manufacturer | MFG:HUMANOID S/N:31 | 3 | | | | |
| Occup | ant Modification | NO COMMENTS | | | | | |
| Occu | pant Description | NO COMMENTS | | | | | |
| Occupa | ant Commentary | NO COMMENTS | | | | | |
| | | | | | | | |
| | | Restraints | <u>5</u> | | | | |
| Restrai | nt # 1 3 POINT | BELT | | | | | |
| Mounte | ed 🗌 | | | | | | |
| Deploy | Deployment NOT APPLICABLE | | | | | | |
| Restrai | nt Commentary | NO COMMENTS | | | | | |
| Restrai | nt # 2 DASHPA | NEL | | | | | |
| Mounte | ed 🗌 | | | | | | |

Deployment NOT APPLICABLE

NO COMMENTS

Restraint Commentary

Vehicle 1 1993 TOYOTA COROLLA

| Test # | 1763 | | | | | | | | | | |
|-----------------|-----------------|----------------|----------|-----------------|------------------------|------------|------------|------------|--------------|---------------|---------------|
| VIN | JT2AE04 | E9P000360 |)7 | | NHTSA Te | est Vehic | le Numbe | r 1 | | | |
| Year | 1993 | | | | Vehicle Mo | dification | Indicator | PROD | UCTION | VEHIC | LE |
| Make | ΤΟΥΟΤΑ | | Post-tes | st Steering | Column Shear | Capsule | Seperatio | n UNKNC | NWC | | |
| Model | COROLL | Α | | Stee | ering Column Co | ollapse N | lechanism | UNKNO | OWN | | |
| Body | FOUR DO | OR SEDAN | 1 | | | | | | | | |
| Engine | 4 CYLINE | DER TRANS | VERSE | FRONT | | | | | | | |
| Displacement | 1.6 | Liter Tr | ansmiss | ion MAN | UAL - FRONT W | HEEL D | RIVE | | | | |
| Vehicle Modifie | cation(s) D | escription | NO CO | MENTS | | | | | | | |
| Vehicle Comm | entary N | O COMMEN | ITS | | | | | | | | |
| Vehicle Ler | ngth 43 | 384 mm | 172.6 | inches | CG | behind l | Front Axle | 1074 | mm | 42.3 | inches |
| Vehicle V | Width 16 | 6 56 mm | 65.2 | inches | Center of D | Damage t | o CG Axis | S O | mm | 0.0 | inches |
| Vehicle Whee | elbase 24 | 154 mm | 96.6 | inches | Total Leng | gth of Inc | dentation | 1656 | mm | 65.2 | inches |
| Vehicle Test W | Veight 12 | 2 33 KG | 2718 | pounds | Maximum S | Static Cru | ish Depth | 409 | mm | 16.1 | inches |
| | | | | | | Pre-Impa | act Speed | 47 | kph | 29.4 | mph |
| Ve | hicle Dama | age Index [| 9999999 | | Princi | ipal Direc | tion of Fo | rce 0 | | | |
| | | | | | | | | | | | |
| | ofile Diet | M | | nto | Cruch from | | | | ~~ \/~ | | :- t - |
| Damage Pr | | | | | Crush fror | | | | - | | |
| | | o-Right, Rea | | | | Pre-Tes | 1 | Post-Te | | <u>Crush</u> | |
| DPD 1 | | m 0.0 | _ inche | | Bumper Corner | - | inches | | inches | | inches |
| DPD 2 | | m 0.0 | inche | | | 4323 | mm | 3960 | mm | 363 | mm |
| DPD 3 | | m 0.0 | _ inche | | Centerline | 172.6 | inches | 156.8 | inches | 15.8 | inches |
| DPD 4 | | m 0.0 | inche | | | 4384 | mm | 3983 | mm | 401 | mm |
| DPD 5 | | m 0.0 | inche | Diabt | Bumper Corner | 170.0 | inches | 153.9 | inches | 16.1 | linches |
| DPD 6 |) m | m 0.0 | inche | s | Bumper Comer | 4318 | mm | 3909 | mm | 409 | |
| | | | | | | 4310 | | 3909 | | 409 |] |
| Bumper F | Engageme | nt | | Sill | Engagement | | | А | -nillar F | ngagem | ent |
| | pact Only | | | | de Impact Only) | | | | - | npact Or | |
| ` | D.0 |) | Г | | FAPPLICABLE | | | Γ | | 0.0 | |
| | 0.0 | | L | | | | | L | | 0.0 | |
| Moving | g Test Cart | | | Moving | g Test Cart/Veh | icle | | Veh | icle Orie | entation | on Cart |
| A | ngle | | | _C | rabbed Angle | | | | Moving | Test Ca | rt |
| NOT A | PPLICAB | LE | | | 0.0 | | | N | OT API | PLICABL | E |
| Magnitude | of the Tilt Ang | le | | Magnitur | e of the Crabbed Ang | le | | | Magnitude | e of the Angl | е |
| Measured b | etween surface | e of a | | Mea | sure Clockwise from | | | Measured | between tł | he Vehicle (| Drientation |
| Rollover Test | Cart and the C | Ground | Lo | ongitudinal Veo | tor to Velocity Vector | of Vehicle | | and D | Direction of | f Test Cart I | Votion |

Vehicle 1 1993 TOYOTA COROLLA

| Test # | 1763 | | | | | | | | | |
|-----------------|--|------------------|----------------------|-------------------|--------------|------------------|------------------|---------------|----------|--------|
| VIN | JT2AE04E9P | 0003607 |] | NHT | SA Test | Vehicle Nu | mber 1 | | | |
| Year | 1993 Vehicle Modification Indicator PRODUCTION VEHICLE | | | | | | | | | |
| Make | ΤΟΥΟΤΑ | Pc | ost-test Steerin | ig Column S | Shear Ca | psule Sepe | ration UN | (NOWN | | |
| Model | COROLLA | | St | eering Colu | mn Colla | apse Mecha | nism UNI | (NOWN | | |
| Body | FOUR DOOR | SEDAN | | | | | | | | |
| Engine | 4 CYLINDER | TRANSVE | RSE FRONT | | | | | | | |
| Displacement | 1.6 Lite | r Trans | smission MA | NUAL - FRO | ONT WHE | EEL DRIVE | | | | |
| Vehicle Modific | cation(s) Descri | iption NC | COMMENTS | | | | | | | |
| Vehicle Comm | entary NO CO | OMMENTS | ; | | | | | | | |
| Vehicle Ler | ngth 4384 | mm | 72.6 inches | | CG be | ehind Front | Axle 1074 | mm | 42.3 | inches |
| Vehicle \ | Width 1656 | mm6 | 5.2 inches | Cente | er of Dan | nage to CG | Axis 0 | mm | 0.0 | inches |
| Vehicle Whee | elbase 2454 | mm | 6.6 inches | Tota | al Length | of Indentat | tion 1656 | mm | 65.2 | inches |
| Vehicle Test W | /eight 1233 | KG 2 | 718 pound | s Maxir | mum Sta | tic Crush De | epth 409 | mm | 16.1 | inches |
| | | | | | Pre | e-Impact Sp | eed 47 | kph | 29.4 | mph |
| Ve | hicle Damage | Index 999 | 9999 | | Principa | I Direction o | f Force 0 | | | |
| | | | | | | | | | | |
| | | <u>Pre</u> | & Post Te | <u>st Dama</u> | <u>ge Me</u> | asureme | <u>ents</u> | | | |
| (Measureme | ents are taken in a lo | ongitudinaldired | ction. Except for En | gine Block, all m | easurement | ts are take from | the Rear Vehi | cle Surface f | orward.) | |
| L | eft Side | | | Center | line | | | Riah | t Side | |
| Pre-Test | Post- | Test | Pre | -Test | | -Test | Pre- | - | | -Test |
| mm inche | s mm | inches | mm | inches | mm | inches | mm | inches | mm | inches |
| | | | Len | gth of Vehi | cle at Ce | nterline | | | | |
| | | | 4384 | 172.6 | 3983 | 156.8 | | | | |
| | | | | Engine | Block | | | | | |
| | | | 414 | 16.3 | 414 | 16.3 | | | | |
| 4323 170.2 | 3960 1 | 55.9 | | Front Burr | nper Corr | ner | 4318 | 170.0 | 3909 | 153.9 |
| | | | | Front of | f Engine | | | | | |
| | | | 3835 | 151.0 | 3696 | 145.5 | | | | |
| 3266 128.6 | 3241 1 | 27.6 | | Fire | wall | | 3266 | 128.6 | 3228 | 127.1 |
| | | | 3320 | 130.7 | 3292 | 129.6 | | | | |
| 2997 118.0 | 2992 1 | 17.8 | Up | per Leading | g Edge of | f Door | 2987 | 117.6 | 2987 | 117.6 |
| 3007 118.4 | 2997 1 | 18.0 | Lov | ver Leading | Edge of | f Door | 2992 | 117.8 | 2982 | 117.4 |
| 3073 121.0 | 3061 1 | 20.5 | | Bottom of | 'A' Post | | 3053 | 120.2 | 3046 | 119.9 |
| 2022 79.6 | 2019 7 | 79.5 | Ur | oper Trailing | Edge of | f Door | 2014 | 79.3 | 2007 | 79.0 |
| 2022 79.6 | 2014 7 | 79.3 | Lo | wer Trailing | Edge of | f Door | 2007 | 79.0 | 2004 | 78.9 |
| | | | | ` | Column | | | | | |
| | | | 2596 | 102.2 | 2667 | 105.0 | | | | |
| | | | Center of Se | | | | ontal) | | | |
| | | | 396 | 15.6 | 404 | 15.9 | | | | |
| | | | Center of Ste | | | | tical) | | | |
| | | | 401 | 15.8 | 376 | 14.8 | | | | |

1993 TOYOTA COROLLA

NHTSA Crash Test - #1763 - Front Impact

Pre/Post Depths - Vehicle Width - Closing Speed - Trapezoidal Average

| Test Vehicle Weight = | 2718 pounds |
|-------------------------|-------------|
| Vehicle Closing Speed = | 29.4 mph |
| Test Crush Length = | 65.2 inches |

Pre/Post Collision Crush Depths (inches)

| | Left Side Crush | Centerline Crush | Right Side Crush | (Daga Sida) |
|---------------|-----------------|------------------|------------------|--------------|
| (Driver Side) | 14.3 | 15.8 | 16.1 | (Pass. Side) |

| | | CRASH | SMAC Stiffness | | |
|----------------------------------|---------|----------|----------------|--------|----------|
| | | <u>A</u> | В | G | <u> </u> |
| Minimum Crush = 14.3 inches | | | | | 141.2 |
| Using a Rated No Damage Speed of | 2.5mph | 157.1 | 118.2 | 104.4 | |
| Using a Rated No Damage Speed of | 5.0mph | 285.0 | 97.2 | 417.7 | |
| Using a Rated No Damage Speed of | 7.5mph | 383.7 | 78.3 | 939.9 | |
| Using a Rated No Damage Speed of | 10.0mph | 453.1 | 61.4 | 1670.9 | |
| Average Crush = 15.5 inches | | | | | 120.2 |
| Using a Rated No Damage Speed of | 2.5mph | 144.9 | 100.6 | 104.4 | |
| Using a Rated No Damage Speed of | 5.0mph | 262.9 | 82.7 | 417.7 | |
| Using a Rated No Damage Speed of | 7.5mph | 354.0 | 66.7 | 939.9 | |
| Using a Rated No Damage Speed of | 10.0mph | 418.1 | 52.3 | 1670.9 | |
| Maximum Crush = 16.1 inches | | | | | 111.4 |
| Using a Rated No Damage Speed of | 2.5mph | 139.5 | 93.2 | 104.4 | |
| Using a Rated No Damage Speed of | 5.0mph | 253.1 | 76.7 | 417.7 | |
| Using a Rated No Damage Speed of | 7.5mph | 340.8 | 61.8 | 939.9 | |
| Using a Rated No Damage Speed of | 10.0mph | 402.5 | 48.5 | 1670.9 | |

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation

A = Maximum force per inch of damage without permanent damage, Ib/in

B = Crush resistance per inch of damage width (Crash), lb/in^2 G = Energy dissipated without permanent damage, Ib

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats KE Speed (mph) = SQRT(30 * CF * max crush in feet)

| Crush | Maximum Crush | Calculated KE Speed | Calculated Error | Calculated Error |
|--------|---------------|---------------------|------------------|------------------|
| Factor | (inches) | (mph) | (mph) | (%) |
| 21 | 16.1 | 29.1 | -0.3 | -1.1 |

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 21.5

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

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Registered Owner: 4N6XPRT SYSTEMS

1993 TOYOTA COROLLA

NHTSA Crash Test - #1763 - Front Impact

Pre/Post Depths - Indention Length - Closing Speed - Trapezoidal Average

| Test Vehicle Weight = | 2718 pounds |
|-------------------------|-------------|
| Vehicle Closing Speed = | 29.4 mph |
| Test Crush Length = | 65.2 inches |

Pre/Post Collision Crush Depths (inches)

| | Left Side Crush | Centerline Crush | Right Side Crush | (Dece Side) |
|---------------|-----------------|------------------|------------------|--------------|
| (Driver Side) | 14.3 | 15.8 | 16.1 | (Pass. Side) |

| | | CRASH | SMAC Stiffness | | |
|----------------------------------|---------|----------|----------------|--------|----------|
| | | <u>A</u> | B | G | <u> </u> |
| Minimum Crush = 14.3 inches | | | | | 141.2 |
| Using a Rated No Damage Speed of | 2.5mph | 157.1 | 118.2 | 104.4 | |
| Using a Rated No Damage Speed of | 5.0mph | 285.0 | 97.2 | 417.7 | |
| Using a Rated No Damage Speed of | 7.5mph | 383.7 | 78.3 | 939.9 | |
| Using a Rated No Damage Speed of | 10.0mph | 453.1 | 61.4 | 1670.9 | |
| Average Crush = 15.5 inches | | | | | 120.2 |
| Using a Rated No Damage Speed of | 2.5mph | 144.9 | 100.6 | 104.4 | |
| Using a Rated No Damage Speed of | 5.0mph | 262.9 | 82.7 | 417.7 | |
| Using a Rated No Damage Speed of | 7.5mph | 354.0 | 66.7 | 939.9 | |
| Using a Rated No Damage Speed of | 10.0mph | 418.1 | 52.3 | 1670.9 | |
| Maximum Crush = 16.1 inches | | | | | 111.4 |
| Using a Rated No Damage Speed of | 2.5mph | 139.5 | 93.2 | 104.4 | |
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| Using a Rated No Damage Speed of | 7.5mph | 340.8 | 61.8 | 939.9 | |
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Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation

A = Maximum force per inch of damage without permanent damage, Ib/in

B = Crush resistance per inch of damage width (Crash), lb/in^2 G = Energy dissipated without permanent damage, Ib

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats KE Speed (mph) = SQRT(30 * CF * max crush in feet)

| Crush | Maximum Crush | Calculated KE Speed | Calculated Error | Calculated Error |
|--------|---------------|---------------------|------------------|------------------|
| Factor | (inches) | (mph) | (mph) | (%) |
| 21 | 16.1 | 29.1 | -0.3 | -1.1 |

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 21.5

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

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Registered Owner: 4N6XPRT SYSTEMS

Available Test Results Front Impact Test Summary

Report Filter Settings

Year Range: 1993 - 1997 Make: TOYOTA Model: COROLLA

| Test Numbe | Vehicle r Info | No Damage Speed (mph) | Average Crush (inch) | • | • | ehicle iffness B | | • | Crush Factor |
|---------------|-------------------------------------|--------------------------------|----------------------------|------|-------|------------------------|-------|-------|-----------------|
| 1771 | 1993 TOYOTA COROLLA FOUR DOOR SEDAN | 5.0 | 19.4 | 35.0 | 252.8 | 78.0 | 409.4 | 106.2 | 25.2 |
| 1763 | 1993 TOYOTA COROLLA FOUR DOOR SEDAN | 5.0 | 15.5 | 29.4 | 263.1 | 82.8 | 417.7 | 120.3 | 22.3 |
| 2019 | 1994 TOYOTA COROLLA FOUR DOOR SEDAN | 5.0 | 15.1 | 29.6 | 274.3 | 89.1 | 422.2 | 129.1 | 23.1 |
| 2034 | 1994 TOYOTA COROLLA FOUR DOOR SEDAN | 5.0 | 19.4 | 34.9 | 276.4 | 85.4 | 447.5 | 116.3 | 25.2 |
| Average (AVG) | | | (AVG) | | 266.7 | 83.8 | 424.2 | 118.0 | 24.0 |
| | | Minimum | (MIN) | | 252.8 | 78.0 | 409.4 | 106.2 | 22.3 |
| | | Maximum | (MAX) | | 276.4 | 89.1 | 447.5 | 129.1 | 25.2 |
| | Standard Deviatio | n (STDev-sa | ample) | | 10.9 | 4.7 | 16.4 | 9.5 | 1.5 |
| | Nu | Imber of Te | sts (n) | 4 | | | | | |

Available Test Results Front Impact Test Summary

Report Filter Settings

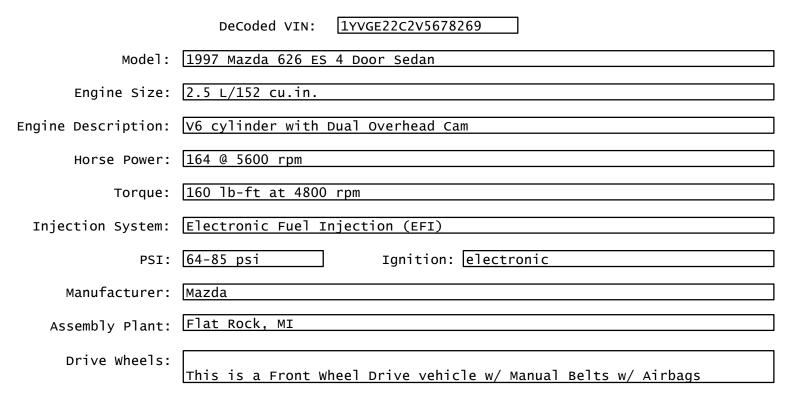
Year Range: 1993 - 1997 Make: TOYOTA Model: COROLLA

| Test Number | Vehicle Info | No Damage Speed (mph) | Max Crush (inch) | • | V S t A | | | | Crush Factor |
|----------------|-------------------------------------|--------------------------------|------------------------|------|----------------|------|-------|-------|-----------------|
| 1771 | 1993 TOYOTA COROLLA FOUR DOOR SEDAN | 5.0 | 20.4 | 35.0 | 240.3 | 70.5 | 409.4 | 96.0 | 24.0 |
| 2034 | 1994 TOYOTA COROLLA FOUR DOOR SEDAN | 5.0 | 21.3 | 34.9 | 251.9 | 70.9 | 447.5 | 96.6 | 22.9 |
| 1763 | 1993 TOYOTA COROLLA FOUR DOOR SEDAN | 5.0 | 16.1 | 29.4 | 253.1 | 76.7 | 417.7 | 111.3 | 21.5 |
| 2019 | 1994 TOYOTA COROLLA FOUR DOOR SEDAN | 5.0 | 15.8 | 29.6 | 262.9 | 81.9 | 422.2 | 118.5 | 22.2 |
| | | Average (| (AVG) | | 252.1 | 75.0 | 424.2 | 105.6 | 22.7 |
| | | Minimum | (MIN) | | 240.3 | 70.5 | 409.4 | 96.0 | 21.5 |
| | | Maximum | (MAX) | | 262.9 | 81.9 | 447.5 | 118.5 | 24.0 |
| | Standard Deviation | on (STDev-sa | mple) | | 9.3 | 5.4 | 16.4 | 11.1 | 1.1 |
| | Νι | umber of Tes | sts (n) | 4 | | | | | |

Expert VIN DeCoder®

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Version Number 3.1.0.3



The First through Third characters (1YV) indicate a Mazda Car made in U.S.A.

The Fourth and Fifth characters (GE) indicate a 626 ES

The Sixth and Seventh characters (22) indicate a 4 Door Sedan

The Eighth character (C) indicates the OEM engine: 2.5 L/152 cu.in., V6, DOHC

The Ninth character (the check digit) is entered as 2. The VIN appears Valid, the calculated value is 2.

The Tenth character (V) indicates the model year 1997

The Eleventh character (5) indicates the vehicle was made in the assembly plant in Flat Rock, MI

The Twelfth through Seventeenth characters (678269) indicate the Serial Number and are unique to this vehicle.

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PROVIDED BY: 4N6XPRT Systems 8387 University Avenue La Mesa CA 91942

7/19/2012

| 1997 mazda 626 es (v6) 4 door sedan | | | |
|---|------------------|----------------------|----------------------|
| Curb Weight: | 2626 1bs. | Rear: | <u>1191</u> kg. |
| Curb Weight Distribution - Front: | 63 % | | 37 % |
| Gross Vehicle Weight Rating: | <u>3795</u> 1bs. | | 1721 kg. |
| Number of Tires on Vehicle: Drive Wheels: | 4 FRONT | | |
| Horizontal Dimensions | Inches | Feet | Meters |
| Total Length | 184 | 15.33 | 4.67 |
| Wheelbase: | 103 | 8.58 | 2.62 |
| Front Bumper to Front Axle: | 39 | 3.25 | 0.99 |
| Front Bumper to Front of Front Well: | 19 | 1.58 | 0.48 |
| Front Bumper to Front of Hood: | 2 | 0.17 | 0.05 |
| Front Bumper to Base of Windshield: | 50 | 4.17 | 1.27 |
| Front Bumper to Top of Windshield: | 77 | 6.42 | 1.96 |
| Rear Bumper to Rear Axle: | 42 | 3.50 | 1.07 |
| Rear Bumper to Rear of Rear Well: | 30 | 2.50 | 0.76 |
| Rear Bumper to Rear of Trunk: | 4 | 0.33 | 0.10 |
| Rear Bumper to Base of Rear Window: | 24 | 2.00 | 0.61 |
| Width Dimensions Maximum Width: Front Track: Rear Track: | 69 59 59 | 5.75 4.92 4.92 | 1.75 1.50 1.50 |
| Vertical Dimensions Height: Ground to - | 55 | 4.58 | 1.40 |
| Front Bumper (Top) | 23 | 1.92 | 0.58 |
| Headlight - center | 25 | 2.08 | 0.64 |
| Hood - top front: | 29 | 2.42 | 0.74 |
| Base of Windshield | 36 | 3.00 | 0.91 |
| Rear Bumper - top: | 27 | 2.25 | 0.69 |
| Trunk - top rear: | 38 | 3.17 | 0.97 |
| Base of Rear Window: | 40 | 3.33 | 1.02 |

| 1997 MAZDA 626 ES (V6) 4 DOOR SEDAN | | | |
|---|--|------------------------------|---|
| Interior Dimensions Front Seat Shoulder Width Front Seat to Headliner Front Leg Room - seatback to floor (max) | Inches 55 39 44 | Feet 4.58 3.25 3.67 | Meters 1.40 0.99 1.12 |
| Rear Seat Shoulder Width Rear Seat to Headliner Front Leg Room - seatback to floor (min) | 55 38 36 | 4.58 3.17 3.00 | 1.40 0.97 0.91 |
| Seatbelts: <u>3pt - front and rear</u> Airbags: FRONT SEAT AIRBAGS | | | |
| Steering Data Turning Circle (Diameter) Steering Ratio: 17.79:1 Wheel Radius: Tire Size (OEM): P195/65R15 | <u> 420</u> <u> 12</u> | 35.00 | 0.30 |
| Acceleration & Braking Information Brake Type: FRONT DISC - REAR DRUM ABS System: ABS UNKNOWN | | | |
| Braking, 60 mph to 0 (Hard pedal, no skid, d d = 156.0 ft t = 3.6 sec a | dry pavement): a = -24.8 ft/s | ec² G-fo | rce = -0.77 |
| 0 to 60mph t = 9.5 sec a 45 to 65mph t = sec a | a = <u>12.2</u> ft/s a = <u>9.3</u> ft/s a = <u>ft/s</u> | ec² G-fo | rce = 0.38 rce = 0.29 rce = |
| Transmission Type: 5spd MANUAL | | | |
| Notes: Federal Bumper Standard Requirements: This vehicles Rated Bumper Strength: | 2.5 mp | | |

N.S.D.C = 1995 - 1997

| 1997 | MAZDA | 626 | ES | (V6) | 4 | DOOR | SEDAN |
|------|-------|-----|----|------|---|------|-------|
|------|-------|-----|----|------|---|------|-------|

| Other Information Tip-Over Stability Ratio = NHTSA Star Rating (calculated) | 1.37 | Stable **** |
|---|------|--------------------------------|
| Center of Gravity (No Load): | | |
| Inches behind front axle | = | 38.11 |
| Inches in front of rear axle | = | 64.89 |
| Inches from side of vehicle | = | 34.50 |
| Inches from ground | = | 21.59 |
| Inches from front corner | = | 84.48 |
| Inches from rear corner | = | 112.32 |
| Inches from front bumper | = | 77.11 |
| Inches from rear bumper | = | 106.89 |
| Moments of Inertia Approximations (No Load): | | |
| Yaw Moment of Inertia | = | 1498.78 lb*ft*sec ² |
| Pitch Moment of Inertia | = | 1450.74 lb*ft*sec ² |
| Roll Moment of Inertia | = | 322.68 lb*ft*sec ² |
| Front Profile Information | | |
| Angle Front Bumper to Hood Front | = | 71.6 deg |
| Angle Front of Hood to Windshield Base | = | 8.3 deg |
| Angle Front of Hood to Windshield Top | = | 17.7 deg |
| Angle of Windshield | = | 32.2 deg |
| Angle of Steering Tires at Max Turn | = | 28.1 deg |
| | | |

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

V(mph) = V(30 * CF * MID)

KE Equivalent Speed (Front/Rear/Side) = 21 CF
Bullet vehicle IMPACT SPEED estimation
based on TARGET VEHICLE damage ONLY = 27 CF
(Tested for Rear/Side Impact only)

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

NHTSA Crash Test #1981

1994 MAZDA 626

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS 8387 UNIVERSITY AVENUE LA MESA CA 91941-3842 11R-030201SC02301

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Sister/Clone database reader

You entered: 1997 MAZDA 626

The Sister/Clone Vehicle Year/Model Interchange list indicates the following are Similar Models

| Year Range | Make | Model | Body Styles | Wheelbase |
|-------------|-------|-------|-------------|-----------|
| 1993 - 1997 | MAZDA | 626 | 2D, 4D, 5D | 105.1 |
| Remarks: | | | | |

The data contained in the database has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. 4N6XPRT Systems® has made no changes to this data, and has only provided for distribution of this data free of charge. 4N6XPRT Systems® makes no warranties, either expressed or implied, with respect to this data, its quality, performance, merchantability, or fitness for any particular purpose. The entire risk as to its quality and performance is with the user. In no event will 4N6XPRT Systems® be liable for direct, indirect, incidental, or consequential damages resulting from any data presented here, even if 4N6XPRT Systems® has been advised of the possibility of such damages. The user must agree to assume full responsibility for any decisions which are based, in whole or in part, upon information obtained by using this data. As previously stated, the data has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. Mr. Anderson does not in any way guarantee the accuracy of the data. Some of the listed similarities are based on his own estimates or memory. Most of the data are pulled from specification tables which may contain inaccuracies of their own. Use common sense - if something seems wrong, check it (and if it is wrong, let him know!).

If you have suggestions, corrections, etc., you should contact Greg Anderson at Scalia Safety Engineering, 521 East Washington Avenue, Suite 200, Madison, WI 53703-2914, (608) 256-0820, FAX (608) 256-0212, E-mail: greganderson@cs.com.

Test Information

| | - | | | | | |
|----------------------|------------------------------------|-----------------|--------------------------------|----------|-------------|--------|
| Test # 1981 | NHTSA Test Reference G | iuide Version # | 2 | | | |
| Test Date 1993-09-3 | D | Contract # | [#] DTNH22-90-D-02121 | | | |
| Contract/Study Title | FY91 VEHICLE SAFETY COMPLIANCE FR | ONTAL BARRIE | R IMPACT TES | T PROGR | АМ | |
| Test Objective(s) | TO OBTAIN VEHICLE CRASHWORTHIN | ESS AND OCCU | IPANT RESTRA | INT PERF | ORMANCE | |
| Test Type | FMVSS 208 OCCUPANT CRASH PROTE | CTION | Configuration | VEHICLE | INTO BARRIE | R |
| Impact Angle | 0 Sic | de Impact Point | 0 | mm | 0.0 | inches |
| | | Offset Distance | 0 | mm | 0.0 | inches |
| | | Closing Speed | 47.5 | Km/Hr | 29.52 | MPH |
| Test Performer | CALSPAN | | | | | |
| Test Reference # | RUN1322 | | | | | |
| Test Track Surface | CONCRETE | Condition | DRY | | | |
| Ambient Temperature | 14 C 57.2 F Total Nu | mber of Curves | 23 | | | |
| Data Recorder Type | FM TAPE RECORDER | | Data Link | UMBILIC | CAL CABLE | |
| Test Commentary | NO COMMENTS | | | | | |

Fixed Barrier Information

| Barrier Type | RIGID | Pole Barrier Diameter 0 | mm | 0 | inches |
|--------------------|--------------------------|--------------------------------|----|---|--------|
| Barrier Shape | FLAT BARRIER | | | | |
| Barrier Commentary | 10*12*5 FT. CONCRETE BAR | RIER | | | |

1994 MAZDA 626 LEFT FRONT SEAT OCCUPANT

| Test # | 1981 | |
|----------------|----------------------|--|
| Vehicle # | 1 | Sex MALE |
| Location | LEFT FRONT SE | Age 0 |
| Position | CENTER POSITI | ON Height 0 mm 0.0 inches |
| Туре | PART 572 DUMN | MY Weight 0.0 kg 0 pounds |
| Size | 50 PERCENTILE | |
| Cal | ibration Method | PART 572 |
| Occupa | nt Manufacturer | MFG:ALDERSON S/N:1019 |
| • | ant Modification | |
| | pant Description | |
| Occupa | ant Commentary | NO COMMENTS |
| Head to - | | Head |
| Windshie | elder Header 439 | |
| | WindShield 587 | |
| | Seatback 0 | mm 0.0 inches HIC Upper Time Interval (ms) 105.48 |
| | Side Header 198 | |
| | Side Window 302 | |
| Neck to Se | | mm 0.0 inches |
| | First Contact Re | |
| 2 | Second Contact Re | agion (Head) |
| | | <u>Chest</u> |
| Chest to - | | Chest |
| | Dash 650 n | nm 25.6 inches Arm to Door 99 mm 3.9 inches |
| Steering | | nm 14.9 inches Hip to Door 137 mm 5.4 inches |
| • | | nm 0.0 inches |
| | Severity Index 47 | |
| | rauma Index | Thorax Peak Acceleration (g's) 53.91 |
| | Lap E | Belt Peak Load -10 Newtons -2.2 pound Force |
| | Shoulder E | Belt Peak Load -10 Newtons -2.2 pound Force |
| First Co | ontact Region (Che | est/Abdomen)AIR BAG |
| | | est/Abdomen) STEERING WHEEL |
| | 2 . | |
| Knees to | Dash 193 n | Legs nm 7.6 inches Knees to Seatback 0 mm 0.0 inches |
| | | 298 Newtons -1191.0 pounds Force |
| | | 410 Newtons -1441.0 pounds Force |
| . ugint i onno | First Contact F | |
| | Second Contact R | |
| | sector somaoth | |

1994 MAZDA 626 LEFT FRONT SEAT OCCUPANT

| Test # | 1981 | | | | | |
|-----------|------------------|-----------------------|----------|---------------|------------|---|
| Vehicle # | 1 | | Sex | MALE | |] |
| Location | LEFT FRONT | SEAT | Age | 0 | | |
| Position | CENTER PO | SITION |] Height | 0 mm | 0.0 inches | |
| Туре | PART 572 D | UMMY |] Weight | 0.0 kg | 0 pounds | 6 |
| Size | 50 PERCENT | TILE |] | | | |
| Cali | ibration Metho | d PART 572 | | | | |
| Occupa | nt Manufacture | er MFG:ALDERSON S/N:1 | 019 | | | |
| Occupa | ant Modificatio | n NO COMMENTS | | | | |
| Occu | pant Description | on NO COMMENTS | | | | |
| Occupa | ant Commenta | ary NO COMMENTS | | | | |
| | | | | | | |
| | | <u>Restraint</u> | <u>s</u> | | | |
| Restrai | nt # 1 FRON | ITAL AIRBAG | | | | |
| Mounte | ed 🗌 | | | | | |
| Deploy | ment DEPL | OYED PROPERLY | | | | |
| Restrai | nt Commenta | ry NO COMMENTS | | | | |
| Restrai | nt # 2 STR. | WHEEL - EA | | | | |
| Mounte | ed 📃 | | | | | |

Deployment NOT APPLICABLE

NO COMMENTS

Restraint Commentary

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1994 MAZDA 626 RIGHT FRONT SEAT OCCUPANT

| Test # 1981 | |
|--|---|
| Vehicle # 1 Sex MALE |] |
| Location RIGHT FRONT SEAT Age 0 | |
| Position CENTER POSITION Height 0 mm 0.0 inches | |
| Type PART 572 DUMMY Weight 0.0 kg 0 pounds | S |
| Size 50 PERCENTILE | |
| Calibration Method PART 572 | |
| Occupant Manufacturer MFG:ALDERSON S/N:1022 | |
| Occupant Modification NO COMMENTS | |
| Occupant Description NO COMMENTS | |
| Occupant Commentary NO COMMENTS | |
| Head to - | |
| Windshielder Header 447 mm 17.6 inches Head Injury Criteria (HIC) 186 | |
| WindShield 594 mm 23.4 inches HIC Lower Time Interval (ms) 75.84 | |
| Seatback 0 mm 0.0 inches HIC Upper Time Interval (ms) 104.88 | 3 |
| Side Header 173 mm 6.8 inches | |
| Side Window 305 mm 12.0 inches | |
| Neck to Seatback 0 mm 0.0 inches | |
| First Contact Region (Head) | |
| Second Contact Region (Head) | |
| | |
| Chest | |
| Chest to - | |
| Dash 617 mm 24.3 inches Arm to Door 107 mm 4.2 inches | |
| Steering Wheel 0 mm 0.0 inches Hip to Door 135 mm 5.3 inches | |
| Seatback 0 mm 0.0 inches | |
| Chest Severity Index 212 Pelvic Peak Lateral Acceleration (g's) Thoracic Trauma Index Thorax Peak Acceleration (g's) 34.77 | |
| | |
| Lap Belt Peak Load -10 Newtons -2.2 pound Force Shoulder Belt Peak Load -10 Newtons -2.2 pound Force | |
| First Contact Region (Chest/Abdomen) AIR BAG | |
| Second Contact Region (Chest/Abdomen) NONE | |
| | |
| | |
| Knees to Dash 185 mm 7.3 inches Knees to Seatback mm 0.0 inches | |
| Left Femur Peak Load -5970 Newtons -1342.1 pounds Force | |
| Right Femur Peak Load -6752 Newtons -1517.9 pounds Force | |
| First Contact Region (Legs) DASHPANEL | |
| Second Contact Region (Legs) | |

1994 MAZDA 626 RIGHT FRONT SEAT OCCUPANT

| Test # | 1981 | | | | | | | |
|-----------|-----------|-----------|---------------------|----------|---------------|--------------|--------|--|
| Vehicle # | 1 | | | Sex | MALE | | | |
| Location | RIGHT | FRONT S | EAT | Age | 0 | | | |
| Position | CENTE | | ON |] Height | 0 m | m 0.0 | inches | |
| Туре | PART | 572 DUMN | IY |] Weight | 0.0 kg | 0 | pounds | |
| Size | 50 PEF | RCENTILE | |] | | | | |
| Cal | libration | Method | PART 572 | | | | | |
| Occupa | int Manu | facturer | MFG:ALDERSON S/N:10 |)22 | | | | |
| Occup | ant Mod | ification | NO COMMENTS | | | | | |
| Occu | ipant De | scription | NO COMMENTS | | | | | |
| Occup | ant Com | mentary | NO COMMENTS | | | | | |
| | | | | | | | | |
| | | | Restraints | <u>8</u> | | | | |
| Restra | int # 1 | FRONTAL | . AIRBAG | | | | | |
| Mount | ed | | | | | | | |
| Deploy | /ment | UNKNOW | N | | | | | |
| Restra | int Comr | nentary | NO COMMENTS | | | | | |
| Restra | int # 2 | DASHPA | NEL | | | | | |
| Mount | | | <u></u> | | | | | |
| Deploy | | NOT APP | LICABLE | | | | | |

Restraint Commentary

NO COMMENTS

Vehicle 1 1994 MAZDA 626

| Test # | 1981 | | | | | | | | | | |
|-----------------|---------------------|---------|-----------|-----------------|----------------------|-------------|------------|-----------------|--------------|---------------|-------------|
| VIN | 1YVGE22C3 | R51035 | 07 | | NHTSA Te | est Vehic | le Numbe | er 1 | | | |
| Year | 1994 | | | | Vehicle Mo | dification | Indicator | PROD | UCTION | VEHICI | LE |
| Make | MAZDA | | Post-test | Steering C | olumn Shear | Capsule | Seperatio | on UNKNO | OWN | | |
| Model | 626 | | | Steer | ing Column Co | ollapse M | lechanisn | UNKNC | NWC | | |
| Body | FOUR DOOF | | | | | | | | | | |
| Engine | 4 CYLINDER | | FRONT | | | | | | | | |
| Displacement | 2 Lite | er Tr | ansmissic | on MANU | AL - FRONT W | VHEEL DI | RIVE | | | | |
| Vehicle Modifie | . , | | NO COM | MENTS | | | | | | | |
| Vehicle Comm | entary 94 M | AZDA 62 | 26 | | | | | | | | |
| Vehicle Ler | ngth 4691 | mm | 184.7 | inches | CG | behind I | Front Axle | e 1115 | mm [| 43.9 | inches |
| Vehicle V | Width 1750 | mm | 68.9 | inches | Center of E | Damage t | o CG Axi | s 0 | mm [| 0.0 | inches |
| Vehicle Whee | elbase 2611 | mm | 102.8 | inches | Total Leng | gth of Ind | lentation | 0 | mm [| 0.0 | inches |
| Vehicle Test V | Veight 1406 | KG | 3099 | pounds | Maximum S | Static Cru | sh Depth | 450 | mm [| 17.7 | inches |
| | | | | | | Pre-Impa | ict Speed | 48 | kph [| 29.5 | mph |
| Ve | hicle Damage | Index g | 999999 | | Princi | ipal Direct | tion of Fo | rce 0 | | | |
| | | | | | | | | | | | |
| Domogo Dr | ofilo Diston | | nuromor | a to | Crush fror | n Dra 8 | Doot To | ot Domo | | oouron | aanta |
| Damage Pr | | | | | Clushillor | | | | | | |
| | ured Left-to-R | | - | | 0 | Pre-Tes | | Post-Tes | | Crush | |
| DPD 1 | | 0.0 | _ inches | | umper Corner | | inches | | inches | | _ inches |
| DPD 2 | | 0.0 | _ inches | | | 4572 | mm | 4204 | mm | 368 | _mm |
| DPD 3 | | 0.0 | _ inches | | Centerline | 184.7 | inches | 167.0 | inches | 17.7 | inches |
| DPD 4 | | 0.0 | _ inches | | | 4691 | mm | 4242 | mm | 449 | mm |
| DPD 5 | | 0.0 | _ inches | Right Br | umper Corner | 179.7 | inches | 164.3 | inches | 15.4 | linches |
| DPD 6 | 0 mm | 0.0 | inches | | | 4564 | mm | 4173 | mm | 391 |] mm |
| | | | | | | | | | | | 7 |
| Bumper E | Engagement | | | Sill E | ngagement | | | A | -pillar E | ngagem | ent |
| • | pact Only) | | | | e Impact Only) | | | | • | npact On | |
| | 0.0 | | | • | APPLICABLE | | | Γ | | 0.0 | Ť |
| | | | | | - | | | L . | | | _ |
| Moving | g Test Cart | | | Moving | Test Cart/Veh | icle | | Veh | icle Orie | entation | on Cart |
| A | ngle | | | Cra | bbed Angle | | | | Moving | Test Ca | rt |
| DIRECT | ENGAGEME | T | | | 0.0 | | | N | OT API | PLICABL | .E |
| • | of the Tilt Angle | | | Magniture | of the Crabbed Ang | le | | | • | of the Angl | |
| Measured b | etween surface of a | 3 | | | re Clockwise from | | | Measured | between th | he Vehicle C |)rientation |
| Rollover Test | Cart and the Grou | nd | Lon | gitudinal Vecto | r to Velocity Vector | of Vehicle | | and D |)irection of | f Test Cart I | Notion |
| | | | | | | | | | | | |

Vehicle 1 1994 MAZDA 626

| Test # | 1981 | | | | | | | | | | |
|---|------------------------------------|-------------------------------|--------------------|-----------------------|------------------------|-----------|--------|--|--|--|--|
| VIN | 1YVGE22C3R510350 | 7 | NHTSA Tes | t Vehicle Num | per 1 | | | | | | |
| Year | 1994 | | Vehicle Modi | ification Indicat | or PRODUCTIC | N VEHIC | LE | | | | |
| Make MAZDA Post-test Steering Column Shear Capsule Seperation UNKNOWN | | | | | | | | | | | |
| Model 626 Steering Column Collapse Mechanism UNKNOWN | | | | | | | | | | | |
| Body | FOUR DOOR SEDAN | | | | | | | | | | |
| Engine | 4 CYLINDER INLINE | RONT | | | | _ | | | | | |
| Displacement | 2 Liter Tra | nsmission MANUA | L - FRONT WH | | |] | | | | | |
| Vehicle Modifie | cation(s) Description | NO COMMENTS | | | | | | | | | |
| Vehicle Comm | nentary 94 MAZDA 620 | 6 | | | | | | | | | |
| Vehicle Ler | ngth 4691 mm | 184.7 inches | CG b | pehind Front Ax | kle 1115 mm | 43.9 | inches | | | | |
| Vehicle | Width 1750 mm | 68.9 inches | Center of Da | mage to CG A | xis <mark>0</mark> mm | 0.0 | inches | | | | |
| Vehicle Whee | elbase 2611 mm | 102.8 inches | - | h of Indentatio | | 0.0 | inches | | | | |
| Vehicle Test V | Veight 1406 KG | 3099 pounds | | atic Crush Dep | | 17.7 | inches | | | | |
| | | | | re-Impact Spee | | 29.5 | mph | | | | |
| Ve | hicle Damage Index 99 | 999999 | Principa | al Direction of F | orce 0 | | | | | | |
| | _ | • - | - - | | | | | | | | |
| | Pr | e & Post Test D | amage Me | easuremen | <u>its</u> | | | | | | |
| (Measurem) | ents are taken in a longitudinaldi | rection. Except for Engine Bl | ock, all measureme | nts are take from the | e Rear Vehicle Surface | forward.) | | | | | |
| L | .eft Side | | Centerline | | Righ | t Side | | | | | |
| Pre-Test | Post-Test | Pre-Tes | Pos | t-Test | Pre-Test | | t-Test | | | | |
| mm inche | es mm inches | mm ind | hes mm | inches | mm inches | mm | inches | | | | |
| | | Length o | of Vehicle at Ce | enterline | | | | | | | |
| | | 4691 18 | 4.7 4242 | 167.0 | | | | | | | |
| | | | Engine Block | | | | | | | | |
| | | 432 17 | 0 432 | 17.0 | | | | | | | |
| 4572 180.0 | 4204 165.5 | Fro | nt Bumper Co | rner [| 4564 179.7 | 4173 | 164.3 | | | | |
| | | F | Front of Engine | <u> </u> | | | | | | | |
| | | 4026 15 | 3.5 3904 | 153.7 | | | | | | | |
| 3465 136.4 | 3460 136.2 | | Firewall | | 3444 135.6 | 3460 | 136.2 | | | | |
| | | 3531 13 | 9.0 3518 | 138.5 | | | | | | | |
| 3114 122.6 | 3109 122.4 | | eading Edge o | | 3109 122.4 | 3106 | 122.3 | | | | |
| 3150 124.0 | 3139 123.6 | Lower L | eading Edge c | of Door | 3145 123.8 | 3114 | 122.6 | | | | |
| 3183 125.3 | | | tom of 'A' Post | | 3178 125.1 | 3157 | 124.3 | | | | |
| 2144 84.4 | 2141 84.3 | | Trailing Edge o | | 2134 84.0 | 2129 | 83.8 | | | | |
| 2149 84.6 | 2144 84.4 | | Trailing Edge o | - | 2141 84.3 | 2131 | 83.9 | | | | |
| | | | teering Colum | | | | | | | | |
| | | 2718 10 | | 110.0 | | | | | | | |
| | | Center of Seering | | | tal) | | | | | | |
| | | 401 15 | | 17.0 | | | | | | | |
| | | Center of Steering | | | al) | | | | | | |
| | | 442 17 | 4 368 | 14.5 | | | | | | | |

1994 MAZDA 626

NHTSA Crash Test - #1981 - Front Impact

Pre/Post Depths - Vehicle Width - Closing Speed - Trapezoidal Average

| Test Vehicle Weight = | 3099 pounds |
|-------------------------|-------------|
| Vehicle Closing Speed = | 29.5 mph |
| Test Crush Length = | 68.9 inches |

Pre/Post Collision Crush Depths (inches)

| | Left Side Crush | Centerline Crush | Right Side Crush | (Daga Sida) |
|---------------|-----------------|------------------|------------------|--------------|
| (Driver Side) | 14.5 | 17.7 | 15.4 | (Pass. Side) |

| | | СКАЗП | SWAC Sumess | | |
|----------------------------------|---------|----------|-------------|--------|----------|
| | | <u>A</u> | В | G | <u> </u> |
| Minimum Crush = 14.5 inches | | | | | 149.4 |
| Using a Rated No Damage Speed of | 2.5mph | 168.0 | 125.2 | 112.7 | |
| Using a Rated No Damage Speed of | 5.0mph | 304.8 | 103.1 | 450.7 | |
| Using a Rated No Damage Speed of | 7.5mph | 410.6 | 83.1 | 1014.2 | |
| Using a Rated No Damage Speed of | 10.0mph | 485.3 | 65.3 | 1802.9 | |
| Average Crush = 16.3 inches | | | | | 118.2 |
| Using a Rated No Damage Speed of | 2.5mph | 149.4 | 99.0 | 112.7 | |
| Using a Rated No Damage Speed of | 5.0mph | 271.2 | 81.6 | 450.7 | |
| Using a Rated No Damage Speed of | 7.5mph | 365.3 | 65.8 | 1014.2 | |
| Using a Rated No Damage Speed of | 10.0mph | 431.7 | 51.7 | 1802.9 | |
| Maximum Crush = 17.7 inches | | | | | 100.3 |
| Using a Rated No Damage Speed of | 2.5mph | 137.6 | 84.0 | 112.7 | |
| Using a Rated No Damage Speed of | 5.0mph | 249.7 | 69.2 | 450.7 | |
| Using a Rated No Damage Speed of | 7.5mph | 336.4 | 55.8 | 1014.2 | |
| Using a Rated No Damage Speed of | 10.0mph | 397.6 | 43.8 | 1802.9 | |

CRASH 3 Stiffness Coefficents

SMAC Stiffness

A = Maximum force per inch of damage without permanent damage, Ib/in

B = Crush resistance per inch of damage width (Crash), lb/in^2

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific G = Energy dissipated without permanent damage, Ib vehicles may, however, have a higher rating

Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats KE Speed (mph) = SQRT(30 * CF * max crush in feet)

| Crush | Maximum Crush | Calculated KE Speed | Calculated Error | Calculated Error |
|--------|---------------|---------------------|------------------|------------------|
| Factor | (inches) | (mph) | (mph) | (%) |
| 21 | 17.7 | 30.5 | 1.0 | 3.2 |

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 19.7

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

Rated No Damage Speed = Impact speed with a barrier

resulting in no permanant vehicle deformation

Available Test Results Front Impact Test Summary

Report Filter Settings

Year Range: 1993 - 1997 Make: MAZDA Model: 626

| Test Number | Vehicle Info | No Damage Speed (mph) | Average Crush (inch) | 0 | | ehicle iffness B | | | Crush Factor |
|----------------|--------------------------|---|----------------------------|------|--------------------------------|-----------------------------|--------------------------------|--------------------------------|-----------------------------|
| 1742 1993 M | AZDA 626 FOUR DOOR SEDAN | 5.0 | 20.0 | 35.0 | 276.5 | 82.9 | 461.2 | 112.8 | 24.5 |
| 1981 1994 M | AZDA 626 FOUR DOOR SEDAN | 5.0 | 16.3 | 29.5 | 271.0 | 81.5 | 450.7 | 118.1 | 21.4 |
| | Standard Deviat | Average (Minimum Maximum (ion (STDev-sa Number of Tes | (MIN) (MAX) imple) | 2 | 273.8 271.0 276.5 3.9 | 82.2 81.5 82.9 1.0 | 456.0 450.7 461.2 7.4 | 115.5 112.8 118.1 3.7 | 23.0 21.4 24.5 2.2 |

Available Test Results Front Impact Test Summary

Report Filter Settings

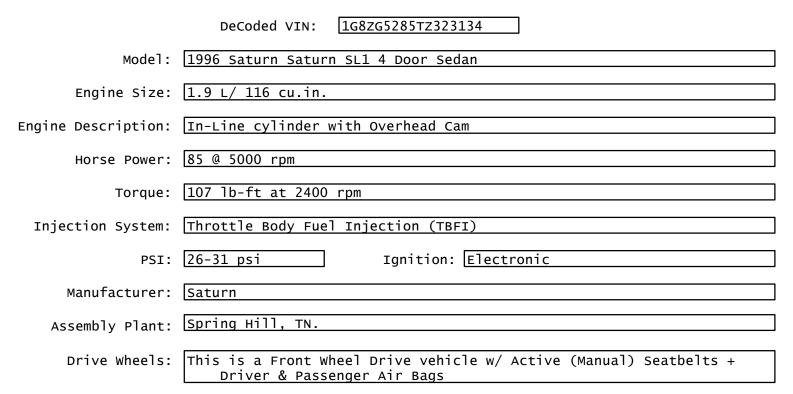
Year Range: 1993 - 1997 Make: MAZDA Model: 626

| Test Number | Vehicle Info | No Damage Speed (mph) | Max Crush (inch) | 0 | | ehicle iffness B | | | Crush Factor |
|----------------|------------------------------|-----------------------------------|------------------------|------|-------------------------|------------------------|-------------------------|-----------------------|----------------------|
| 1981 199 | 94 MAZDA 626 FOUR DOOR SEDAN | 5.0 | 17.7 | 29.5 | 249.5 | 69.0 | 450.7 | 100.1 | 19.7 |
| 1742 199 | 33 MAZDA 626 FOUR DOOR SEDAN | 5.0 | 21.8 | 35.0 | 253.6 | 69.7 | 461.2 | 94.9 | 22.4 |
| | | Average (Minimum Maximum (| (MIN) | | 251.6 249.5 253.6 | 69.4 69.0 69.7 | 456.0 450.7 461.2 | 97.5 94.9 100.1 | 21.1 19.7 22.4 |
| | Standard Deviat | tion (STDev-sa | mple) | | 2.9 | 0.5 | 7.4 | 3.7 | 1.9 |
| | 1 | Number of Tes | sts (n) | 2 | | | | | |

Expert VIN DeCoder®

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Version Number 3.1.0.3



The First through Third characters (1G8) indicate a Saturn Car made in the U.S.A.

The Fourth and Fifth characters (ZG) indicate a Saturn SL1

The Sixth character (5) indicates a 4 Door Sedan

The Seventh character (2) indicates Active (Manual) Seatbelts + Driver & Passenger Air Bags

The Eighth character (8) indicates the OEM engine: 1.9 L/ 116 cu.in., L4, OHC

The Ninth character (the check digit) is entered as 5. The VIN appears Valid, the calculated value is 5.

The Tenth character (T) indicates the model year 1996

- The Eleventh character (Z) indicates the vehicle was made in the assembly plant in Spring Hill, TN.
- The Twelfth through Seventeenth characters (323134) indicate the Serial Number and are unique to this vehicle.

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> PROVIDED BY: 4N6XPRT Systems 8387 University Avenue La Mesa CA 91942

7/19/2012

| 1996 SATURN SL1 4 DOOR SEDAN | | | |
|---|----------------|----------------------|----------------------|
| Curb Weight: | 2348 lbs. | Rear: | 1065 kg. |
| Curb Weight Distribution - Front: | 61 % | | 39 % |
| Gross Vehicle Weight Rating: | 3244 lbs. | | 1471 kg. |
| Number of Tires on Vehicle: Drive Wheels: | 4 FRONT | | |
| Horizontal Dimensions | Inches | Feet | Meters |
| Total Length | 177 | 14.75 | 4.50 |
| Wheelbase: | 102 | 8.50 | 2.59 |
| Front Bumper to Front Axle: | 37 | 3.08 | 0.94 |
| Front Bumper to Front of Front Well: | 23 | 1.92 | 0.58 |
| Front Bumper to Front of Hood: | 6 | 0.50 | 0.15 |
| Front Bumper to Base of Windshield: | 46 | 3.83 | 1.17 |
| Front Bumper to Top of Windshield: | 77 | 6.42 | 1.96 |
| Rear Bumper to Rear Axle: | 38 | 3.17 | 0.97 |
| Rear Bumper to Rear of Rear Well: | 20 | 1.67 | 0.51 |
| Rear Bumper to Rear of Trunk: | 5 | 0.42 | 0.13 |
| Rear Bumper to Base of Rear Window: | 19 | 1.58 | 0.48 |
| Width Dimensions Maximum Width: Front Track: Rear Track: | 67 57 56 | 5.58 4.75 4.67 | 1.70 1.45 1.42 |
| Vertical Dimensions Height: Ground to - | 55 | 4.58 | 1.40 |
| Front Bumper (Top) | 20 | 1.67 | 0.51 |
| Headlight - center | 23 | 1.92 | 0.58 |
| Hood - top front: | 26 | 2.17 | 0.66 |
| Base of Windshield | 35 | 2.92 | 0.89 |
| Rear Bumper - top: | 23 | 1.92 | 0.58 |
| Trunk - top rear: | 38 | 3.17 | 0.97 |
| Base of Rear Window: | 41 | 3.42 | 1.04 |

| 1996 SATURN SL1 4 DOOR SEDAN | | | |
|--|--|------------------------------|---|
| Interior Dimensions Front Seat Shoulder Width Front Seat to Headliner Front Leg Room - seatback to floor (max) | Inches 53 39 41 | Feet 4.42 3.25 3.42 | Meters 1.35 0.99 1.04 |
| Rear Seat Shoulder Width Rear Seat to Headliner Front Leg Room - seatback to floor (min) | 53 39 26 | 4.42 3.25 2.17 | 1.35 0.99 0.66 |
| Seatbelts: <u>3pt - front and rear</u> Airbags: FRONT SEAT AIRBAGS | | | |
| Steering Data Turning Circle (Diameter) Steering Ratio: :1 Wheel Radius: Tire Size (OEM): 175/70R14 | 480 | 40.00 | 0.30 |
| Acceleration & Braking Information Brake Type: FRONT DISC - REAR DRUM ABS System: ALL WHEEL ABS - OPTIONAL Braking, 60 mph to 0 (Hard pedal, no skid, o | dry pavement): | | |
| Acceleration: 0 to 30mph $t = 3.5$ sec a 0 to 60mph $t = 9.7$ sec a | $a = \frac{-27.2}{ft/s}$ $a = \frac{12.6}{ft/s}$ $a = \frac{9.1}{ft/s}$ $a = \frac{4.4}{ft/s}$ | sec² G-fo sec² G-fo | rce = -0.85 rce = 0.39 rce = 0.28 rce = 0.14 |
| Transmission Type: <u>4spd AUTOMATIC</u> Notes: Federal Bumper Standard Requirements: | <u>2.5</u> mp | bh | |
| This vehicles Rated Bumper Strength: | 5 mp | bh | |

N.S.D.C = 1996 - 1999

| 1996 SATURN SL1 4 DOOR SEDAN | |
|--|---|
| Other Information Tip-Over Stability Ratio = NHTSA Star Rating (calculated) | 1.31 Stable **** |
| Center of Gravity (No Load): Inches behind front axle Inches in front of rear axle Inches from side of vehicle Inches from ground Inches from front corner Inches from rear corner Inches from rear bumper Inches from rear bumper | = 39.78 $= 62.22$ $= 33.50$ $= 21.59$ $= 83.77$ $= 105.67$ $= 76.78$ $= 100.22$ |
| Moments of Inertia Approximations (No Load) Yaw Moment of Inertia Pitch Moment of Inertia Roll Moment of Inertia | : = <u>1212.44</u> lb*ft*sec ² = <u>1175.52</u> lb*ft*sec ² = <u>272.64</u> lb*ft*sec ² |
| Front Profile Information Angle Front Bumper to Hood Front Angle Front of Hood to Windshield Base Angle Front of Hood to Windshield Top Angle of Windshield Angle of Steering Tires at Max Turn | $= \frac{45.0}{12.7} deg$ = 20.8 deg = 30.1 deg = 24.4 deg |

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

V(mph) = V(30 * CF * MID)

KE Equivalent Speed (Front/Rear/Side) = 21 CF
Bullet vehicle IMPACT SPEED estimation
based on TARGET VEHICLE damage ONLY = 27 CF
(Tested for Rear/Side Impact only)

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

NHTSA Crash Test #3199

1999 SATURN SL1

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS 8387 UNIVERSITY AVENUE LA MESA CA 91941-3842 11R-030201SC02301

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Sister/Clone database reader

You entered: 1996 SATURN SL

The Sister/Clone Vehicle Year/Model Interchange list indicates the following are Similar Models

| Year Range | Make | Model | Body Styles | Wheelbase |
|----------------------------------|-------------------------|----------------------|-------------|-----------|
| 1996 - 2002 Remarks: SL, SL1, | SATURN SL2 - new bod | SL y panels in 97 | | 102.4 |
| 1996 - 2001 Remarks: SW1, SW | SATURN /2 | SW | | 102.4 |
| 1997 - 2002 Remarks: SC1, SC2 | SATURN 2 | SC | 2D | 102.4 |

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If you have suggestions, corrections, etc., you should contact Greg Anderson at Scalia Safety Engineering, 521 East Washington Avenue, Suite 200, Madison, WI 53703-2914, (608) 256-0820, FAX (608) 256-0212, E-mail: greganderson@cs.com.

Test Information

| Test # 3199 | | NHT | SA Test F | Reference G | Guide Version # | V3 | | | |
|----------------------|-------------------|-----------|-----------|-------------|-----------------|---------------|----------|-------------|--------|
| Test Date 1999-08-1 | 5 | | | | Contract # | DTNH22-95- | D-08168 | | |
| Contract/Study Title | EVALUATIO | N OF AIF | rbag pei | RFORMAN | CE | | | | |
| Test Objective(s) | 1999 SATU | RN SL1 II | NTO A F | LAT FRON | TAL BARRIER A | T 30 MPH | | | |
| Test Type | BASELINE T | EST | | | | Configuration | VEHICLE | INTO BARRIE | R |
| Impact Angle | 0 | | | Sie | de Impact Point | 99999 | mm | 0.0 | inches |
| | | | | | Offset Distance | 99999 | mm | 0.0 | inches |
| | | | | | Closing Speed | 50.2 | Km/Hr | 31.19 | MPH |
| Test Performer | TRC OF OHI | 0 | | | | | | | |
| Test Reference # | 990816-1 | | | | | | | | |
| Test Track Surface | CONCRETE | | | | Condition | DRY | | | |
| Ambient Temperature | 22 C | 71.6 | F | Total Nu | mber of Curves | 54 | | | |
| Data Recorder Type | OTHER | | | | | Data Link | UMBILIC | CAL CABLE | |
| Test Commentary | RECTYP IS C | NBOAR | D DIGITA | L. CONFO | RMS TO SAE J2 | 211 MAR95 PC | LARITIES | • | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Fixed Barrier Information

| Barrier Type | RIGID | Pole Barrier Diameter 9999 | mm | 9999 | inches |
|--------------------|--------------|-----------------------------------|----|------|--------|
| Barrier Shape | FLAT BARRIER | | | | |
| Barrier Commentary | NO COMMENTS | | | | |

1999 SATURN SL1 LEFT FRONT SEAT OCCUPANT

| Test # 3199 | |
|--|--|
| Vehicle # 1 Sex FEMALE | |
| Location LEFT FRONT SEAT Age 99 | |
| Position FORWARD OF CENTER POSITION Height 999 mm 39.3 inches | |
| Type HYBRID III DUMMY Weight 999.0 kg 2202 pounds | |
| Size 5 PERCENTILE | |
| Calibration Method HYBRID III | |
| Occupant Manufacturer MFG: FIRST TECHNOLOGY SAFETY SYSTEMS, S/N: 289 | |
| Occupant Modification NO COMMENTS | |
| Occupant Description NO COMMENTS | |
| Occupant Commentary NO COMMENTS | |
| Head to - | |
| Windshielder Header 279 mm 11.0 inches Head Injury Criteria (HIC) 323 | |
| WindShield 603 mm 23.7 inches HIC Lower Time Interval (ms) 43.36 | |
| Seatback 9999 mm 0.0 inches HIC Upper Time Interval (ms) 79.36 | |
| Side Header 250 mm 9.8 inches | |
| Side Window 345 mm 13.6 inches | |
| Neck to Seatback 9999 mm 0.0 inches | |
| First Contact Region (Head) AIR BAG | |
| Second Contact Region (Head) | |
| | |
| Chest | |
| Chest to - | |
| Dash 424 mm 16.7 inches Arm to Door 155 mm 6.1 inches | |
| Steering Wheel 223 mm 8.8 inches Hip to Door 160 mm 6.3 inches | |
| Seatback 9999 mm 0.0 inches | |
| Chest Severity Index 221 Pelvic Peak Lateral Acceleration (g's) | |
| Thoracic Trauma Index Thorac Peak Acceleration (g's) 33.7 | |
| Lap Belt Peak Load 9999 Newtons 2247.9 pound Force | |
| Shoulder Belt Peak Load 9999 Newtons 2247.9 pound Force | |
| First Contact Region (Chest/Abdomen) | |
| Second Contact Region (Chest/Abdomen) NONE | |
| Legs | |
| Knees to Dash 127 mm 5.0 inches Knees to Seatback 9999 mm 0.0 inches | |
| Left Femur Peak Load -3266 Newtons -734.2 pounds Force | |
| Right Femur Peak Load -632 Newtons -142.1 pounds Force | |
| First Contact Region (Legs) DASHPANEL | |
| Second Contact Region (Legs) | |

1999 SATURN SL1 LEFT FRONT SEAT OCCUPANT

| Test # | 3199 | | | | | | |
|-----------|-------------------|---------|---------------------|----------------|-----------------|------------|-----|
| Vehicle # | 1 | | | Sex | FEMALE | | |
| Location | LEFT FRO | ONT SE | AT | Age | 99 | | |
| Position | FORWAR | D OF C | ENTER POSITION | Height | 999 mm | 39.3 inche | es |
| Туре | HYBRID I | II DUMN | ΛY | Weight | 999.0 kg | 2202 pour | lds |
| Size | 5 PERCE | NTILE | | | | | |
| Cali | ibration Me | thod | HYBRID III | | | | |
| Occupa | nt Manufac | cturer | MFG: FIRST TECHNOLO | GY SAFETY SYST | EMS, S/N: 28 | 9 | |
| Occupa | ant Modific | ation | NO COMMENTS | | | | |
| Occu | pant Descr | ription | NO COMMENTS | | | | |
| Occupa | ant Comme | entary | NO COMMENTS | | | | |
| | | | | | | | |
| | | | Restraints | <u>8</u> | | | |
| Restrai | nt # 1 3 | POINT I | BELT | | | | |
| Mounte | ed 🗌 | | | | | | |
| Deploy | ment NO | OT APP | LICABLE | | | | |
| Restrai | nt Comme | ntary | NO COMMENTS | | | | |
| Restrai | nt # 2 F F | RONTAL | AIRBAG | | | | |
| Mounte | | | | | | | |

Deployment NOT APPLICABLE

NO COMMENTS

Restraint Commentary

1999 SATURN SL1 RIGHT FRONT SEAT OCCUPANT

| Test # | 3199 | |
|------------|----------------------|--|
| Vehicle # | 1 | Sex FEMALE |
| Location | RIGHT FRONT S | EAT Age 99 |
| Position | FORWARD OF C | ENTER POSITION Height 999 mm 39.3 inches |
| Туре | HYBRID III DUM | MY Weight 999.0 kg 2202 pounds |
| Size | 5 PERCENTILE | |
| Cal | libration Method | HYBRID III |
| Occupa | nt Manufacturer | MFG: FIRST TECHNOLOGY SAFETY SYSTEMS, S/N: 369 |
| Occup | ant Modification | NO COMMENTS |
| Occu | pant Description | NO COMMENTS |
| Occupa | ant Commentary | CLIP3M & CSI CALCULATED USING CHEST X & Z DATA CHANNELS ONLY. |
| Head to - | | Head |
| Windshie | elder Header 268 | |
| | WindShield 618 | |
| | Seatback 999 | |
| | Side Header 252 | |
| | Side Window 344 | |
| Neck to Se | | mm 0.0 inches |
| | First Contact R | |
| S | Second Contact Re | egion (Head) |
| | | |
| 0 | | <u>Chest</u> |
| Chest to - | Deeb 200 | |
| | | nm 15.1 inches Arm to Door 155 mm 6.1 inches |
| Steering V | | nm 0.0 inches Hip to Door 172 mm 6.8 inches nm 0.0 inches |
| | Severity Index 26 | |
| | rauma Index | Thorax Peak Acceleration (g's) 34 |
| | | Belt Peak Load 9999 Newtons 2247.9 pound Force |
| | • | Belt Peak Load 9999 Newtons 2247.9 pound Force |
| First Co | | est/Abdomen) AIR BAG |
| | | est/Abdomen) NONE |
| | ondot nogion (on | |
| Knoret | Deeb 404 | Legs |
| Knees to | | nm <u>5.3</u> inches Knees to Seatback 9999 mm 0.0 inches |
| | = | 806 Newtons -406.0 pounds Force |
| Right Femi | | 05 Newtons -158.5 pounds Force |
| | First Contact F | |
| | Second Contact F | |

1999 SATURN SL1 RIGHT FRONT SEAT OCCUPANT

| Test # | 3199 | | |
|--|---|---|--|
| Vehicle # | 1 | | Sex FEMALE |
| Location | RIGHT FROM | T SEAT | Age 99 |
| Position | FORWARD O | F CENTER POSITION | Height 999 mm 39.3 inches |
| Туре | HYBRID III D | UMMY | Weight 999.0 kg 2202 pounds |
| Size | 5 PERCENTI | LE | |
| Cal | libration Metho | d HYBRID III | |
| Occupa | Int Manufacture | er MFG: FIRST TECHNOLO | GY SAFETY SYSTEMS, S/N: 369 |
| Occup | ant Modificatio | n NO COMMENTS | |
| Occu | upant Description | n NO COMMENTS | |
| • • • • | | | |
| Occup | ant Commenta | ITY CLIP3M & CSI CALCUL | ATED USING CHEST X & Z DATA CHANNELS ONLY. |
| Occup | ant Commenta | Iry CLIP3M & CSI CALCUL | ATED USING CHEST X & Z DATA CHANNELS ONLY. |
| Occup | ant Commenta | | |
| Occup | | ITY CLIP3M & CSI CALCULA Restraints NT BELT | |
| · | int # 1 3 POI | Restraint | |
| Restra | int # 1 3 POI | Restraint | |
| Restra Mounte Deploy | int # 1 3 POI | Restraints | |
| Restra Mounto Deploy Restra | int # 1 3 POI ed /ment NOT / int Commenta | Restraints | |
| Restra Mounto Deploy Restra | int # 1 3 POI ed /ment NOT / int Commental int # 2 FRON | Restraints | |
| Restra Mounte Deploy Restra Restra | int # 1 3 POI ed /ment NOT / int Commental int # 2 FRON ed | Restraints | |

Vehicle 1 1999 SATURN SL1

| Test # 3199 |
|---|
| VIN 1G8ZG5289XZ208090 NHTSA Test Vehicle Number 1 |
| Year 1999 Vehicle Modification Indicator PRODUCTION VEHICLE |
| Make SATURN Post-test Steering Column Shear Capsule Seperation NOT APPLICABLE |
| Model SL1 Steering Column Collapse Mechanism UNKNOWN |
| Body FOUR DOOR SEDAN |
| Engine 4 CYLINDER TRANSVERSE FRONT |
| Displacement 1.9 Liter Transmission MANUAL - FRONT WHEEL DRIVE |
| Vehicle Modification(s) Description MODEL IS SL1 |
| Vehicle Commentary NO COMMENTS |
| Vehicle Length 4700 mm 185.0 inches CG behind Front Axle 1126 mm 44.3 inches |
| Vehicle Width 1688 mm 66.5 inches Center of Damage to CG Axis 1584 mm 62.4 inches |
| Vehicle Wheelbase 2600 mm 102.4 inches Total Length of Indentation 1525 mm 60.0 inches |
| Vehicle Test Weight 1186 KG 2614 pounds Maximum Static Crush Depth 488 mm 19.2 inches |
| Pre-Impact Speed 50 kph 31.2 mph |
| Vehicle Damage Index 12FDEW3 Principal Direction of Force 0 |
| |
| Demoge Brefile Distance Measurements Cruch from Dre & Dest Test Demoge Measurements |
| Damage Profile Distance Measurements Crush from Pre & Post Test Damage Measurements |
| (Measured Left-to-Right, Rear-to-Front) <u>Pre-Test</u> <u>Post-Test</u> <u>Crush Depth</u> |
| DPD 1 245 mm 9.6 inches Left Bumper Corner 179.3 inches 173.2 inches 6.1 inches |
| DPD 2 355 mm 14.0 inches 4555 mm 4400 mm 155 mm |
| DPD 3 439 mm 17.3 inches Centerline 185.0 inches 165.8 inches 19.2 inches |
| DPD 4 430 mm 16.9 inches 4700 mm 4212 mm 488 mm |
| DPD 5 399 mm 15.7 inches mm 15.7 inches mm 11.0 inches Right Bumper Corner 179.3 inches 167.4 inches 11.9 inches |
| DPD 6 303 mm 11.9 inches Kight Bumper Comer 179.3 inches 167.4 inches 11.9 inches 4555 mm 4252 mm 303 mm |
| |
| Bumper Engagement Sill Engagement A-pillar Engagement |
| (Inline Impact Only) (Side Impact Only) (Side Impact Only) |
| 999.0 NOT APPLICABLE 999.0 |
| |
| Moving Test Cart Moving Test Cart/Vehicle Vehicle Orientation on Cart |
| Angle Crabbed Angle Moving Test Cart |
| NOT APPLICABLE 0.0 NOT APPLICABLE |
| Magnitude of the Tilt Angle Magniture of the Crabbed Angle Magnitude of the Angle |
| Measured between surface of a Measure Clockwise from Measured between the Vehicle Orientation |
| Rollover Test Cart and the Ground Longitudinal Vector to Velocity Vector of Vehicle and Direction of Test Cart Motion |

Vehicle 1 1999 SATURN SL1

| Test # | 3199 | | | | |
|-----------------|-------------------------------------|--------------------------------------|----------------------------|------------------------------|-------------|
| VIN | 1G8ZG5289XZ208090 | NH NH | ITSA Test Vehicle Nu | umber 1 | |
| Year | 1999 | Veh | icle Modification Indi | cator PRODUCTIO | N VEHICLE |
| Make | SATURN F | Post-test Steering Column | Shear Capsule Sep | eration NOT APPLIC | ABLE |
| Model | SL1 | Steering Col | umn Collapse Mecha | anism UNKNOWN | |
| Body | FOUR DOOR SEDAN | | | | |
| Engine | 4 CYLINDER TRANSV | ERSE FRONT | | | |
| Displacement | 1.9 Liter Trai | nsmission MANUAL - FR | ONT WHEEL DRIVE | | |
| Vehicle Modific | cation(s) Description | NODEL IS SL1 | | | |
| Vehicle Comm | entary NO COMMENT | <u>S</u> | | | |
| Vehicle Len | igth 4700 mm | 185.0 inches | CG behind Front | t Axle 1126 mm | 44.3 inches |
| Vehicle V | Width 1688 mm | 66.5 inches Cen | ter of Damage to CO | G Axis 1584 mm | 62.4 inches |
| Vehicle Whee | elbase 2600 mm | 102.4 inches Tot | tal Length of Indenta | ation 1525 mm | 60.0 inches |
| Vehicle Test W | /eight 1186 KG | 2614 pounds Max | imum Static Crush D | Depth 488 mm | 19.2 inches |
| | | | Pre-Impact S | peed 50 kph | 31.2 mph |
| Vel | hicle Damage Index 12 | PER STERNS | Principal Direction | of Force 0 | |
| | | | | | |
| | <u>Pre</u> | e & Post Test Dama | age Measurem | <u>ents</u> | |
| (Measureme | ents are taken in a longitudinaldir | ection. Except for Engine Block, all | measurements are take from | n the Rear Vehicle Surface f | orward.) |
| L | eft Side | Cente | rline | Righ | t Side |
| Pre-Test | Post-Test | Pre-Test | Post-Test | Pre-Test | Post-Test |
| mm inche | s mm inches | mm inches | mm inches | mm inches | mm inches |
| | | Length of Veh | icle at Centerline | | |
| | | 4700 185.0 | 4212 165.8 | | |
| | | Engin | e Block | | |
| | | 410 16.1 | 410 16.1 | | |
| 4555 179.3 | 4400 173.2 | Front Bu | mper Corner | 4555 179.3 | 4252 167.4 |
| | | Front | of Engine | | |
| | | 3994 157.2 | 3773 148.5 | | |
| 3565 140.4 | 3503 137.9 | Fire | ewall | 3555 140.0 | 3541 139.4 |
| | | 3610 142.1 | 3545 139.6 | | |
| 3184 125.4 | 3186 125.4 | Upper Leadin | g Edge of Door | 3178 125.1 | 3174 125.0 |
| 3171 124.8 | 3169 124.8 | Lower Leadin | g Edge of Door | 3161 124.4 | 3156 124.3 |
| 3180 125.2 | 3163 124.5 | Bottom o | f 'A' Post | 3180 125.2 | 3150 124.0 |
| 2225 87.6 | 2228 87.7 | Upper Trailin | g Edge of Door | 2221 87.4 | 2219 87.4 |
| 2246 88.4 | 2244 88.3 | Lower Trailin | g Edge of Door | 2235 88.0 | 2232 87.9 |
| | | | g Column | | |
| | | 2760 108.7 | 2765 108.9 | | |
| | | Center of Seering Colu | | contal) | |
| | | 280 11.0 | 298 11.7 | | |
| | | Center of Steering Colu | | ertical) | |
| | | 460 18.1 | 440 17.3 | | |

1999 SATURN SL1

NHTSA Crash Test - #3199 - Front Impact

Pre/Post Depths - Vehicle Width - Closing Speed - Trapezoidal Average

| Test Vehicle Weight = | 2614 pounds |
|-------------------------|-------------|
| Vehicle Closing Speed = | 31.2 mph |
| Test Crush Length = | 66.5 inches |

Pre/Post Collision Crush Depths (inches)

| | Left Side Crush | Centerline Crush | Right Side Crush | (Dece Side) |
|---------------|-----------------|------------------|------------------|--------------|
| (Driver Side) | 6.1 | 19.2 | 11.9 | (Pass. Side) |

| | | CRASH 3 Stiffness Coefficents | | | SMAC Stiffness |
|----------------------------------|---------|-------------------------------|-------|--------|----------------|
| | | <u>A</u> | В | G | <u> </u> |
| Minimum Crush = 6.1 inches | | | | | 824.6 |
| Using a Rated No Damage Speed of | 2.5mph | 370.8 | 697.7 | 98.5 | |
| Using a Rated No Damage Speed of | 5.0mph | 677.0 | 581.4 | 394.2 | |
| Using a Rated No Damage Speed of | 7.5mph | 918.6 | 475.7 | 886.9 | |
| Using a Rated No Damage Speed of | 10.0mph | 1095.6 | 380.6 | 1576.7 | |
| Average Crush = 14.1 inches | | | | | 154.3 |
| Using a Rated No Damage Speed of | 2.5mph | 160.4 | 130.6 | 98.5 | |
| Using a Rated No Damage Speed of | 5.0mph | 292.9 | 108.8 | 394.2 | |
| Using a Rated No Damage Speed of | 7.5mph | 397.4 | 89.0 | 886.9 | |
| Using a Rated No Damage Speed of | 10.0mph | 474.0 | 71.2 | 1576.7 | |
| Maximum Crush = 19.2 inches | | | | | 83.2 |
| Using a Rated No Damage Speed of | 2.5mph | 117.8 | 70.4 | 98.5 | |
| Using a Rated No Damage Speed of | 5.0mph | 215.1 | 58.7 | 394.2 | |
| Using a Rated No Damage Speed of | 7.5mph | 291.8 | 48.0 | 886.9 | |
| Using a Rated No Damage Speed of | 10.0mph | 348.1 | 38.4 | 1576.7 | |

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation

vehicles may, however, have a higher rating

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific

A = Maximum force per inch of damage without permanent damage, Ib/in

B = Crush resistance per inch of damage width (Crash), lb/in^2

G = Energy dissipated without permanent damage, Ib

Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats KE Speed (mph) = SQRT(30 * CF * max crush in feet)

| Crush | Maximum Crush | Calculated KE Speed | Calculated Error | Calculated Error |
|--------|---------------|---------------------|------------------|------------------|
| Factor | (inches) | (mph) | (mph) | (%) |
| 21 | 19.2 | 31.7 | 0.6 | 1.8 |

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.3

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

1999 SATURN SL1

NHTSA Crash Test - #3199 - Front Impact

Pre/Post Depths - Indention Length - Closing Speed - Trapezoidal Average

| Test Vehicle Weight = | 2614 pounds |
|-------------------------|-------------|
| Vehicle Closing Speed = | 31.2 mph |
| Test Crush Length = | 60.0 inches |

Pre/Post Collision Crush Depths (inches)

| | Left Side Crush | Centerline Crush | Right Side Crush | (Dece Side) |
|---------------|-----------------|------------------|------------------|--------------|
| (Driver Side) | 6.1 | 19.2 | 11.9 | (Pass. Side) |

| | | CRASH 3 Stiffness Coefficents | | | SMAC Stiffness |
|----------------------------------|---------|-------------------------------|-------|--------|----------------|
| | | <u>A</u> | В | G | <u> </u> |
| Minimum Crush = 6.1 inches | | | | | 912.7 |
| Using a Rated No Damage Speed of | 2.5mph | 410.5 | 772.3 | 109.1 | |
| Using a Rated No Damage Speed of | 5.0mph | 749.4 | 643.6 | 436.3 | |
| Using a Rated No Damage Speed of | 7.5mph | 1016.8 | 526.6 | 981.7 | |
| Using a Rated No Damage Speed of | 10.0mph | 1212.7 | 421.3 | 1745.2 | |
| Average Crush = 14.1 inches | | | | | 170.8 |
| Using a Rated No Damage Speed of | 2.5mph | 177.6 | 144.5 | 109.1 | |
| Using a Rated No Damage Speed of | 5.0mph | 324.2 | 120.5 | 436.3 | |
| Using a Rated No Damage Speed of | 7.5mph | 439.9 | 98.6 | 981.7 | |
| Using a Rated No Damage Speed of | 10.0mph | 524.6 | 78.9 | 1745.2 | |
| Maximum Crush = 19.2 inches | | | | | 92.1 |
| Using a Rated No Damage Speed of | 2.5mph | 130.4 | 78.0 | 109.1 | |
| Using a Rated No Damage Speed of | 5.0mph | 238.1 | 65.0 | 436.3 | |
| Using a Rated No Damage Speed of | 7.5mph | 323.0 | 53.2 | 981.7 | |
| Using a Rated No Damage Speed of | 10.0mph | 385.3 | 42.5 | 1745.2 | |

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation

vehicles may, however, have a higher rating

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific

A = Maximum force per inch of damage without permanent damage, Ib/in

B = Crush resistance per inch of damage width (Crash), lb/in^2

G = Energy dissipated without permanent damage, Ib

Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats KE Speed (mph) = SQRT(30 * CF * max crush in feet)

| Crush | Maximum Crush | Calculated KE Speed | Calculated Error | Calculated Error |
|--------|---------------|---------------------|------------------|------------------|
| Factor | (inches) | (mph) | (mph) | (%) |
| 21 | 19.2 | 31.7 | 0.6 | 1.8 |

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.3

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

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Registered Owner: 4N6XPRT SYSTEMS

Available Test Results Front Impact Test Summary

Report Filter Settings

Year Range: 1996 - 2002 Make: SATURN Model: SL

| Test Number | Vehicle n Info | No Damage A Speed | Average Crush | • | • | ehicle iffness | | | Crush |
|----------------|---------------------------------|-------------------------|------------------|-------|-------|-------------------|-------|-------|--------|
| | | (mph) | (inch) | (mph) | A | B | G | Kv | Factor |
| 3127 | 1999 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 18.8 | 29.9 | 218.8 | 57.9 | 413.5 | 83.5 | 19.0 |
| 2765 | 1998 SATURN SL2 FOUR DOOR SEDAN | 5.0 | 22.3 | 35.2 | 219.9 | 59.5 | 406.0 | 80.9 | 22.2 |
| 3250 | 2000 SATURN SL2 FOUR DOOR SEDAN | 5.0 | 20.8 | 35.2 | 241.1 | 69.9 | 415.9 | 95.0 | 23.8 |
| 2468 | 1997 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 15.3 | 29.4 | 263.8 | 84.2 | 413.3 | 122.2 | 22.6 |
| 3113 | 1999 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 14.3 | 30.0 | 274.7 | 95.8 | 393.9 | 137.9 | 25.1 |
| 3199 | 1999 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 14.9 | 31.2 | 276.5 | 97.0 | 394.2 | 137.5 | 26.1 |
| 3109 | 1999 SATURN SC1 TWO DOOR COUPE | 5.0 | 15.7 | 29.3 | 296.8 | 92.2 | 477.8 | 134.0 | 22.0 |
| 3195 | 1999 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 11.5 | 35.0 | 410.1 | 213.2 | 394.3 | 290.3 | 42.5 |
| 3191 | 1999 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 11.0 | 35.0 | 431.5 | 235.9 | 394.6 | 321.1 | 44.6 |
| 3082 | 1999 SATURN SC1 TWO DOOR COUPE | 5.0 | 6.1 | 22.1 | 464.2 | 259.6 | 415.0 | 433.4 | 32.0 |
| | | Average (A | AVG) | | 309.7 | 126.5 | 411.9 | 183.6 | 28.0 |
| | | Minimum | (MIN) | | 218.8 | 57.9 | 393.9 | 80.9 | 19.0 |
| | | Maximum (| MAX) | | 464.2 | 259.6 | 477.8 | 433.4 | 44.6 |
| | Standard Devia | ation (STDev-sa | mple) | | 90.9 | 77.7 | 25.1 | 120.9 | 8.9 |
| | | Number of Tes | ts (n) | 10 | | | | | |

Available Test Results Front Impact Test Summary

Report Filter Settings

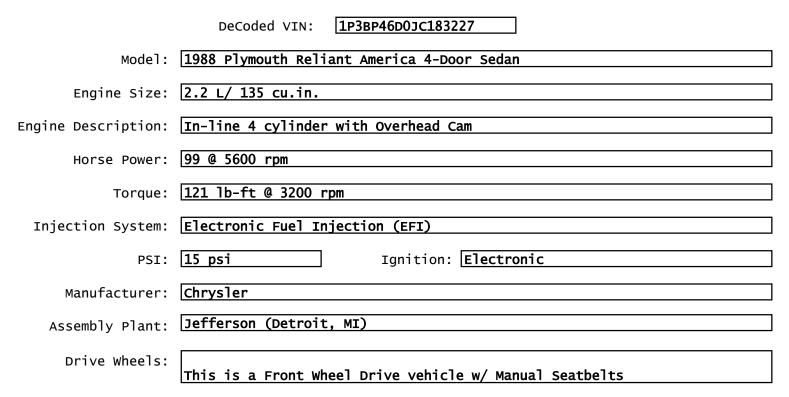
Year Range: 1996 - 2002 Make: SATURN Model: SL

| Test Numbei | Vehicle Info | No Damage Speed (mph) | Max Crush (inch) | | V 6 S t A | | | | Crush Factor |
|----------------|---------------------------------|--------------------------------|------------------------|------|------------------|------|-------|-------|-----------------|
| 2002 | | | | | | | | | |
| 3082 | 1999 SATURN SC1 TWO DOOR COUPE | 5.0 | 27.0 | 22.1 | 105.1 | 13.3 | 415.0 | 22.2 | 7.2 |
| 3127 | 1999 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 20.7 | 29.9 | 199.2 | 48.0 | 413.5 | 69.2 | 17.3 |
| 3195 | 1999 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 23.1 | 35.0 | 204.6 | 53.1 | 394.3 | 72.3 | 21.2 |
| 2765 | 1998 SATURN SL2 FOUR DOOR SEDAN | 5.0 | 23.6 | 35.2 | 207.4 | 53.0 | 406.0 | 72.0 | 20.9 |
| 3199 | 1999 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 19.2 | 31.2 | 215.0 | 58.6 | 394.2 | 83.1 | 20.3 |
| 3250 | 2000 SATURN SL2 FOUR DOOR SEDAN | 5.0 | 23.3 | 35.2 | 215.4 | 55.8 | 415.9 | 75.8 | 21.2 |
| 3113 | 1999 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 17.4 | 30.0 | 226.0 | 64.8 | 393.9 | 93.3 | 20.7 |
| 2468 | 1997 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 17.1 | 29.4 | 236.0 | 67.4 | 413.3 | 97.8 | 20.2 |
| 3109 | 1999 SATURN SC1 TWO DOOR COUPE | 5.0 | 18.9 | 29.3 | 246.6 | 63.6 | 477.8 | 92.5 | 18.2 |
| 3191 | 1999 SATURN SL1 FOUR DOOR SEDAN | 5.0 | 18.6 | 35.0 | 254.1 | 81.8 | 394.6 | 111.4 | 26.3 |
| | | Average (| AVG) | | 210.9 | 55.9 | 411.9 | 79.0 | 19.4 |
| | | Minimum | (MIN) | | 105.1 | 13.3 | 393.9 | 22.2 | 7.2 |
| | | Maximum | (MAX) | | 254.1 | 81.8 | 477.8 | 111.4 | 26.3 |
| | Standard Deviation | n (STDev-sa | mple) | | 41.4 | 17.8 | 25.1 | 24.1 | 4.9 |
| | Nu | mber of Tes | sts (n) | 10 | | | | | |

Expert VIN DeCoder®

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Version Number 3.1.0.3



- The First through Third characters (1P3) indicate a Plymouth Passenger Car made in the U.S.A.
- The Fourth character (B) indicates Manual Seatbelts
- The Fifth and Sixth characters (P4) indicate a Reliant America
- The Seventh character (6) indicates a 4-Door Sedan
- The Eighth character (D) indicates the OEM engine: 2.2 L/ 135 cu.in., L4, OHC
- The Ninth character (the check digit) is entered as 0. The VIN appears Valid, the calculated value is 0.
- The Tenth character (J) indicates the model year 1988
- The Eleventh character (C) indicates the vehicle was made in the assembly plant in Jefferson (Detroit, MI)
- The Twelfth through Seventeenth characters (183227) indicate the Serial Number and are unique to this vehicle.

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PROVIDED BY: 4N6XPRT Systems 8387 University Avenue La Mesa CA 91941

7/24/2012

1988 PLYMOUTH RELIANT 4 DOOR SEDAN

| Curb Weight: Curb Weight Distribution - Front: | 2323 1bs. | | 054 kg. 37 % |
|--|--|--|--|
| Gross Vehicle Weight Rating: | 1bs. | | kg. |
| Number of Tires on Vehicle: Drive Wheels: | 4 FRONT | | |
| Horizontal Dimensions Total Length Wheelbase: | Inches 176 100 | Feet 14.67 8.33 | Meters 4.47 2.54 |
| Front Bumper to Front Axle: Front Bumper to Front of Front Well: Front Bumper to Front of Hood: Front Bumper to Base of Windshield: Front Bumper to Top of Windshield: | 38 21 5 50 71 | 3.17 1.75 0.42 4.17 5.92 | 0.97 0.53 0.13 1.27 1.80 |
| Rear Bumper to Rear Axle: Rear Bumper to Rear of Rear Well: Rear Bumper to Rear of Trunk: Rear Bumper to Base of Rear Window: | 38 27 5 35 | 3.17 2.25 0.42 2.92 | 0.97 0.69 0.13 0.89 |
| Width Dimensions Maximum Width: Front Track: Rear Track: | 68 58 57 | 5.67 4.83 4.75 | 1.73 1.47 1.45 |
| Vertical Dimensions Height: Ground to - | 52 | 4.33 | 1.32 |
| Front Bumper (Top) Headlight - center Hood - top front: Base of Windshield Rear Bumper - top: Trunk - top rear: Base of Rear Window: | 18 27 32 36 21 34 39 | 1.50 2.25 2.67 3.00 1.75 2.83 3.25 | 0.46 0.69 0.81 0.91 0.53 0.86 0.99 |

1988 PLYMOUTH RELIANT 4 DOOR SEDAN

| Interior Dimensions Front Seat Shoulder Width Front Seat to Headliner Front Leg Room - seatback to floor (max) | Inches 55 39 43 | Feet 4.58 3.25 3.58 | Meters 1.40 0.99 1.09 |
|--|---|------------------------------|---|
| Rear Seat Shoulder Width Rear Seat to Headliner Front Leg Room - seatback to floor (min) | 59 38 36 | 4.92 3.17 3.00 | 1.50 0.97 0.91 |
| Seatbelts: 3pt - front and rear Airbags: NO AIRBAGS | | | |
| Steering Data Turning Circle (Diameter) Steering Ratio: 21.26:1 Wheel Radius: Tire Size (OEM): P175=75R13 | <u>444</u> <u>11</u> | 37.00 0.92 | 0.28 |
| Acceleration & Braking Information Brake Type: ALL DRUM - POWER ABS System: ABS UNKNOWN | | | |
| Braking, 60 mph to 0 (Hard pedal, no skid, d = 180.0 ft t = 4.1 sec Acceleration: | dry pavement): a = -21.5 ft/se | c² G-for | ce = -0.67 |
| 0 to 30mpht = 5.7 sec0 to 60mpht = 15.7 sec45 to 65mpht = 10.4 sec | a = 7.7 ft/se a = 5.6 ft/se a = 2.8 ft/se | c² G-for | ce = 0.17 |
| Transmission Type: 4spd MANUAL | | | |
| Notes: Federal Bumper Standard Requirements: This vehicles Rated Bumper Strength: | 2.5 mph 5 mph | | |

N.S.D.C = 1981 - 1989

1988 PLYMOUTH RELIANT 4 DOOR SEDAN

| Other Information | | |
|--|------|---------------------------------------|
| Tip-Over Stability Ratio = | 1.41 | Stable |
| NHTSA Star Rating (calculated) | [| **** |
| Center of Gravity (No Load): | | |
| Inches behind front axle | = | 37.00 |
| Inches in front of rear axle | = | 63.00 |
| Inches from side of vehicle | = | 34.00 |
| Inches from ground | = | 20.41 |
| Inches from front corner | = | 82.35 |
| Inches from rear corner | = | 106.57 |
| Inches from front bumper | = | 75.00 |
| Inches from rear bumper | = | 101.00 |
| Moments of Inertia Approximations (No Load): | | |
| Yaw Moment of Inertia | = | 1186.69 lb*ft*sec ² |
| Pitch Moment of Inertia | = | 1150.77 lb*ft*sec ² |
| Roll Moment of Inertia | = | 268.14 lb*ft*sec ² |
| Front Profile Information | | |
| Angle Front Bumper to Hood Front | = | 70.3 deg |
| Angle Front of Hood to Windshield Base | = | 5.1 deg |
| Angle Front of Hood to Windshield Top | = | 15.3 deg |
| Angle of Windshield | = | 33.7 deg |
| Angle of Steering Tires at Max Turn | = | 25.8 deg |

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

| $V(mph) = \sqrt{(30 * CF * MID)}$ | | |
|---|---|-------|
| KE Equivalent Speed (Front/Rear/Side) | = | 21 CF |
| Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY | = | 27 CF |
| (Tested for Rear/Side Impact only) | | |

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

NHTSA Crash Test #567

1983 PLYMOUTH RELIANT

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS 8387 UNIVERSITY AVENUE LA MESA CA 91941-3842 11R-030201SC02301

Copyright 2011 - All Rights Reserved 4N6XPRT Systems | 8387 University Avenue | La Mesa, CA 91942 | USA (800) 266-9778 | (619) 464-3478 | FAX: (619) 464-2206 | Email: 4n6@4n6xprt.com

Sister/Clone database reader

You entered: 1988 PLYMOUTH RELIANT

The Sister/Clone Vehicle Year/Model Interchange list indicates the following are Similar Models

| Year Range | Make | Model | Body Styles | Wheelbase |
|---------------------------------|-----------------------------|---------------------------------|-------------|-----------|
| 1981 - 1989 Remarks: NEW K- | DODGE CAR CHASSIS. SW c | ARIES liscontinued after 88. | 2D, 4D, SW | 99.6 |
| 1981 - 1989 Remarks: SW disc | PLYMOUTH ontinued after 88. | RELIANT | 2D, 4D, SW | 99.6 |

The data contained in the database has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. 4N6XPRT Systems® has made no changes to this data, and has only provided for distribution of this data free of charge. 4N6XPRT Systems® makes no warranties, either expressed or implied, with respect to this data, its quality, performance, merchantability, or fitness for any particular purpose. The entire risk as to its quality and performance is with the user. In no event will 4N6XPRT Systems® be liable for direct, indirect, incidental, or consequential damages resulting from any data presented here, even if 4N6XPRT Systems® has been advised of the possibility of such damages. The user must agree to assume full responsibility for any decisions which are based, in whole or in part, upon information obtained by using this data. As previously stated, the data has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. Mr. Anderson does not in any way guarantee the accuracy of the data. Some of the listed similarities are based on his own estimates or memory. Most of the data are pulled from specification tables which may contain inaccuracies of their own. Use common sense - if something seems wrong, check it (and if it is wrong, let him know!).

If you have suggestions, corrections, etc., you should contact Greg Anderson at Scalia Safety Engineering, 521 East Washington Avenue, Suite 200, Madison, WI 53703-2914, (608) 256-0820, FAX (608) 256-0212, E-mail: greganderson@cs.com.

Test Information

| - · · · [| | | | | | | |
|----------------------|-------------|-----------------|------------------------|----------------|-----------|--------------|----------|
| Test # 567 | | NHISA Test R | eference Guide Version | # 1 | | | |
| Test Date 1983-04-2 | 7 | | Contract | # DTNH2282C | 01140 | | |
| Contract/Study Title | FY-83 VEHIC | LE IMPACT TEST | | | | | |
| Test Objective(s) | FY-83 VEH.B | ARRIER TESTS TO | REQUIREMENTS OF | MVSS NOS.208 | 8/212/219 | /301-7 | |
| Test Type | NEW CAR AS | SESSMENT TEST | | Configuration | VEHICLI | E INTO BARRI | R |
| Impact Angle | 0 | | Side Impact Po | int 0 | mm | 0.0 |] inches |
| | | | Offset Distar | ce 0 | mm | 0.0 |] inches |
| | | | Closing Spe | ed 56.0 |] Km/Hr | 34.80 |] MPH |
| Test Performer | CALSPAN | | | | | | |
| Test Reference # | CD0307 | | | | | | |
| Test Track Surface | CONCRETE | | Conditio | on DRY | | | |
| Ambient Temperature | 22 C | 71.6 F | Total Number of Curv | es 71 | | | |
| Data Recorder Type | FM TAPE REC | ORDER | | Data Link | UMBILI | CAL CABLE | |
| Test Commentary | NO COMMEN | NTS | | | | | |

Fixed Barrier Information

| Barrier Type | RIGID | Pole Barrier Diameter 0 | mm | 0 | inches |
|--------------------|-------------------|--------------------------------|----|---|--------|
| Barrier Shape | LOAD CELL BARRIER | |] | | |
| Barrier Commentary | NO COMMENTS | | | | |

1983 PLYMOUTH RELIANT LEFT FRONT SEAT OCCUPANT

| Test # | 567 | |
|------------|------------------------------------|--|
| Vehicle # | 1 | Sex MALE |
| Location | LEFT FRONT SE | EAT Age 0 |
| Position | CENTER POSITI | ION Height 0 mm 0.0 inches |
| Туре | PART 572 DUMN | MY Weight 0.0 kg 0 pounds |
| Size | 50 PERCENTILE | <u> </u> |
| Cal | ibration Method | OTHER |
| Occupa | nt Manufacturer | HUMANOID 819 |
| Occup | ant Modification | |
| Occu | pant Description | NO COMMENTS |
| Occupa | ant Commentary | NO COMMENTS |
| Head to - | | Head |
| windshie | elder Header 419 WindShield 572 | |
| | Seatback 0 | |
| | Side Header 157 | |
| c | Side Window 241 | |
| Neck to Se | | mm 0.0 inches |
| NECK ID DE | First Contact Re | |
| c | Second Contact Re | |
| | | |
| | | Chest |
| Chest to - | | onest |
| | Dash 589 n | mm [23.2] inches Arm to Door [140] mm [5.5] inches |
| Steering | | mm 17.0 inches Hip to Door 203 mm 8.0 inches |
| - | | mm 0.0 inches |
| | Severity Index 41 | |
| | rauma Index | Thorax Peak Acceleration (g's) 55.05 |
| | Lap E | Belt Peak Load 0 Newtons 0.0 pound Force |
| | • | Belt Peak Load 0 Newtons 0.0 pound Force |
| First Co | ontact Region (Che | nest/Abdomen) NONE |
| | • • | nest/Abdomen) UNKNOWN |
| | Ū (| |
| Knees to | Dash 218 n | Legs mm 8.6 inches Knees to Seatback0 mm 0.0 inches |
| | ur Peak Load 0 | Newtons 0.0 pounds Force |
| | ur Peak Load 0 | Newtons 0.0 pounds Force |
| | First Contact R | |
| | Second Contact R | |
| | Cooling Sonialor N | |

1983 PLYMOUTH RELIANT LEFT FRONT SEAT OCCUPANT

| Test # | 567 | | | | | | | | |
|-----------|------------|----------|--------------|----------|------|----|-----|----------|--|
| Vehicle # | 1 | | | Sex | MALE | | | | |
| Location | LEFT FF | RONT SE | AT | Age | 0 |] | | | |
| Position | CENTER | R POSITI | ON |] Height | 0 | mm | 0.0 | inches | |
| Туре | PART 57 | 72 DUMN | IY |] Weight | 0.0 | kg | 0 |] pounds | |
| Size | 50 PER | CENTILE | |] | | | | | |
| Cali | ibration M | lethod | OTHER | | | | | | |
| Occupai | nt Manufa | acturer | HUMANOID 819 | | | | | | |
| Occupa | ant Modifi | ication | | | | | | | |
| Occu | pant Des | cription | NO COMMENTS | | | | | | |
| Occupa | ant Comm | nentary | NO COMMENTS | | | | | | |
| | | | | | | | | | |
| | | | Restraint | <u>s</u> | | | | | |
| Restrai | nt # 1 🖪 | | BELT | | | | | | |
| Mounte | ed [| | | | | | | | |
| Deploy | ment 📘 | NOT APP | LICABLE | | | | | | |
| Restrai | nt Comm | entary | | | | | | | |
| Restrai | nt # 2 🔽 | DASHPAN | IEL | | | | | | |
| Mounte | = | | | | | | | | |

Deployment NOT APPLICABLE

Restraint Commentary

1983 PLYMOUTH RELIANT RIGHT FRONT SEAT OCCUPANT

| Test # | 567 | | |
|------------|----------------------------------|---|--|
| Vehicle # | 1 | Sex MALE | |
| Location | RIGHT FRONT S | SEAT Age 0 | |
| Position | CENTER POSITI | ION Height 0 mm 0.0 inches | |
| Туре | PART 572 DUMM | MY Weight 0.0 kg 0 pounds | |
| Size | 50 PERCENTILE | <u> </u> | |
| Cal | ibration Method | OTHER | |
| Occupa | nt Manufacturer | HUMANOID 162 | |
| Occup | ant Modification | | |
| Occu | pant Description | NO COMMENTS | |
| Occup | ant Commentary | NO COMMENTS | |
| Head to - | | <u>Head</u> | |
| Windshie | elder Header | | |
| | WindShield 556 | | |
| | Seatback 0 | mm 0.0 inches HIC Upper Time Interval (ms) 117.08 | |
| | Side Header 157 | | |
| | Side Window 241 | | |
| Neck to Se | | mm 0.0 inches | |
| | First Contact Re | | |
| | Second Contact Re | .egion (Head) | |
| | | | |
| | | <u>Chest</u> | |
| Chest to - | | | |
| | | mm 23.0 inches Arm to Door 152 mm 6.0 inches | |
| Steering | | mm 0.0 inches Hip to Door 198 mm 7.8 inches | |
| | | mm [0.0] inches | |
| | Severity Index 26 rauma Index | 66 Pelvic Peak Lateral Acceleration (g's) Thorax Peak Acceleration (g's) 38.77 | |
| | | Belt Peak Load 0 Newtons 0.0 pound Force | |
| | • | Belt Peak Load 0 Newtons 0.0 pound Force | |
| First C | | nest/Abdomen) | |
| | • • | nest/Abdomen) UNKNOWN | |
| | ondot Region (on | | |
| | | | |
| Knees to | | mm 8.0 inches Knees to Seatback mm 0.0 inches | |
| | ur Peak Load | | |
| Right Fem | ur Peak Load 0 | | |
| | First Contact R | | |
| | Second Contact R | Kegion (Legs) | |

1983 PLYMOUTH RELIANT RIGHT FRONT SEAT OCCUPANT

| Test # | 567 | | | |
|-----------|--------------------|--------------|-------------------|----------------------|
| Vehicle # | 1 | | Sex MALE | |
| Location | RIGHT FRONT | SEAT | Age 0 | I |
| Position | CENTER POSI | TION | Height 0 | mm 0.0 inches |
| Туре | PART 572 DUM | IMY | Weight 0.0 | kg 0 pounds |
| Size | 50 PERCENTIL | E | | |
| Cal | libration Method | OTHER | | |
| Occupa | nt Manufacturer | HUMANOID 162 | | |
| Occup | ant Modification | | | |
| Occu | pant Description | NO COMMENTS | | |
| Occup | ant Commentary | NO COMMENTS | | |
| | | | | |
| | | Restraint | | |
| Restra | int # 1 3 POIN | T BELT | | |
| Mounte | ed 📃 | | | |
| Deploy | ment NOT AF | PLICABLE | | |
| Restra | int Commentary | | | |
| Restra | int # 2 DASHP | ANEL | | |

Deployment NOT APPLICABLE Restraint Commentary

Mounted

Vehicle 1 1983 PLYMOUTH RELIANT

| Test # | 567 | | | | | | | | | | | | |
|-----------------|-------------------|-------|----------|----------|---------------|----------|-----------------------|------------|------------|----------------|--------------------|---------------------|------------|
| VIN | | | | | | | NHTSA Te | est Vehic | le Numbe | er 1 | | | |
| Year | 1983 |] | | | | ١ | /ehicle Mo | dification | Indicator | PROD | OUCTION | VEHIC | LE |
| Make | PLYMO | DUTH | | Post-tes | t Steering | ງ Colur | mn Shear | Capsule | Seperatio | on UNKN | OWN | | |
| Model | RELIAN | T | | | Ste | ering | Column Co | ollapse M | lechanisn | n OTHE | R | | |
| Body | STATIC | ON WA | GON | | | | | | | | | | |
| Engine | 4 CYLI | NDER | TRANS | /ERSE I | FRONT | | | | | | | | |
| Displacement | 2.2 | Lite | r Tra | ansmissi | on AUT | OMAT | IC - FRON | IT WHEE | L DRIVE | | | | |
| Vehicle Modific | () | | • • | | | | | | | | | | |
| Vehicle Comm | entary | NO CO | OMMEN | TS | _ | | | | | | | | |
| Vehicle Ler | ngth | 4458 | mm | 175.5 | inches | | CG | behind I | Front Axle | e 1074 | mm | 42.3 | inches |
| Vehicle \ | Width | 1727 | mm | 68.0 | inches | C | Center of D | Damage t | o CG Axi | s 864 | mm | 34.0 | inches |
| Vehicle Whee | elbase | 2540 | mm | 100.0 | inches | | Total Leng | gth of Inc | lentation | 1588 | | 62.5 | inches |
| Vehicle Test W | Veight | 1329 | KG | 2929 | pounds | Ν | Maximum S | | • | | | 26.1 | inches |
| | | | | | | | | Pre-Impa | • | | kph | 34.8 | mph |
| Ve | hicle Dai | mage | Index 1 | 2FDEW | 3 | | Princi | ipal Direc | tion of Fo | rce 0 | | | |
| | | | | | | | | | | | | | |
| Damage Pr | ofile Di | stanc | e Meas | ureme | nts | C | rush fror | n Pre & | Post Te | st Dam | ade Me | asuren | nents |
| | | | ght, Rea | | | <u> </u> | | Pre-Tes | | Post-Te | | Crush | |
| DPD 1 | | mm | 23.4 | inches | | Rumr | ber Corner | | inches | 0.0 | inches | | inches |
| | | mm | 25.6 | inches | | Dump | | 0.0 | mm | 0.0 |] mm | 0.0 | |
| DPD 3 | | mm | 26.0 | inches | | | | | | | - | | _ |
| DPD 4 | | mm | 26.4 | inches | | C | Centerline | 0.0 | inches | 0.0 | inches | - | _ inches |
| DPD 5 | | mm | 26.5 | inches | | | | 0 | mm | 0 |] mm | 0 | mm |
| DPD 6 | | mm | 24.1 | inches | Piaht | Bump | er Corner | 0.0 | inches | 0.0 |] inches | 0.0 | inches |
| | 512 | | 2 | | - | | | 0 | mm | 0 |] mm | 0 | mm |
| | | | | | | | | | | | | | |
| Bumper E | Ingagen | nent | | | Sil | Enga | gement | | | ŀ | ∖- pillar E | ingagem | ent |
| (Inline Im | npact On | ıly) | | _ | (Si | ide Im | pact Only) | | | | (Side In | npact Or | ıly) |
| (| 0.0 | | | | NO | T APP | PLICABLE | | | | | 0.0 | |
| Moving | Toot Co | - rt | | | Movin | | t Cart/Vah | iala | | Vol | aiolo Oriv | ontation | on Cort |
| - | g Test Ca nglo | a11 | | | | - | t Cart/Veh d Angle | | | ver | | entation Test Ca | |
| | ngle APPLICA | RIE | | | | 0 | | | | | - | PLICABL | |
| | of the Tilt A | | | | Magniti | | Crabbed Ang | le | | r | | e of the Angl | |
| Measured be | | - | | | - | | ockwise from | | | Measured | - | he Vehicle C | |
| Rollover Test | | | d | Lo | | | elocity Vector | of Vehicle | | | | f Test Cart l | |
| | | | | 20 | J | | | | | | | | |

Vehicle 1 1983 PLYMOUTH RELIANT

| Test # | 567 | | | | | | | | |
|-----------------|--|--------------------------------|----------------------|-----------------------|--------------------------|-------------|--|--|--|
| VIN | | | NHTSA Test | t Vehicle Num | per 1 | | | | |
| Year | 1983 Vehicle Modification Indicator PRODUCTION VEHICLE | | | | | | | | |
| Make | PLYMOUTH | Post-test Steering C | olumn Shear Ca | apsule Sepera | tion UNKNOWN | | | | |
| Model | RELIANT | Steeri | ng Column Colla | apse Mechanis | sm OTHER | | | | |
| Body | STATION WAGON | | | | | | | | |
| Engine | 4 CYLINDER TRANS | VERSE FRONT | | | | | | | |
| Displacement | 2.2 Liter Tr | ansmission AUTON | IATIC - FRONT | WHEEL DRIV | E | | | | |
| Vehicle Modific | ation(s) Description | | | | | | | | |
| Vehicle Comm | entary NO COMMEN | TS | | | | | | | |
| Vehicle Len | gth 4458 mm | 175.5 inches | CG b | ehind Front A | kle 1074 mm | 42.3 inches | | | |
| Vehicle V | Vidth 1727 mm | 68.0 inches | Center of Dar | mage to CG A | xis 864 mm | 34.0 inches | | | |
| Vehicle Whee | lbase 2540 mm | 100.0 inches | Total Length | h of Indentatio | n 1588 mm | 62.5 inches | | | |
| Vehicle Test W | /eight 1329 KG | 2929 pounds | Maximum Sta | atic Crush Dep | th 663 mm | 26.1 inches | | | |
| | | | Pr | re-Impact Spee | ed 56 kph | 34.8 mph | | | |
| Vel | nicle Damage Index 1 | 2FDEW3 | Principa | al Direction of F | orce 0 | | | | |
| | | | | | | | | | |
| | <u>P</u> | <u>re & Post Test I</u> | <u> Damage Me</u> | easuremen | ts | | | | |
| (Measureme | ents are taken in a longitudinalo | lirection. Except for Engine B | lock, all measuremer | nts are take from the | e Rear Vehicle Surface f | orward.) | | | |
| L | eft Side | | Centerline | | Righ | t Side | | | |
| Pre-Test | Post-Test | Pre-Tes | | t-Test | Pre-Test | Post-Test | | | |
| mm inche | s mm inches | mm ir | ches mm | inches | mm inches | mm inches | | | |
| | | Length | of Vehicle at Ce | enterline | | | | | |
| | | 0 0. | | 0.0 | | | | | |
| | | | Engine Block | | | | | | |
| | | 0 0. | 0 0 | 0.0 | | | | | |
| 0.0 | 0.0 | Fre | ont Bumper Cor | mer | 0.0 | 0 0.0 | | | |
| | | | Front of Engine | 9 | | | | | |
| | | 0 0. | 0 0 | 0.0 | | | | | |
| 0.0 | 0.0 | | Firewall | | 0.0 | 0 0.0 | | | |
| | | 0 0. | 0 0 | 0.0 | | | | | |
| 0 0.0 | 0 0.0 | Upper | Leading Edge o | of Door | 0.0 | 0.0 | | | |
| 0.0 | 0 0.0 | Lowerl | _eading Edge o | of Door | 0.0 | 0.0 | | | |
| 0 0.0 | 0 0.0 | Bo | ttom of 'A' Post | | 0.0 | 0.0 | | | |
| 0.0 | 0.0 | Upper | Trailing Edge o | of Door | 0.0 | 0 0.0 | | | |
| 0.0 | 0 0.0 | Lower | Trailing Edge o | of Door | 0.0 | 0.0 | | | |
| | | | Steering Columr | | | | | | |
| | | 0 0. | | 0.0 | | | | | |
| | | Center of Seerin | <u> </u> | | tal) | | | | |
| | | 0 0. | | 0.0 | | | | | |
| | | Center of Steerin | <u> </u> | | al) | | | | |
| | | 0 0. | 0 0 | 0.0 | | | | | |

Registered Owner: 4N6XPRT SYSTEMS

Serial Number: 11R-030201SC02301

1983 PLYMOUTH RELIANT

NHTSA Crash Test - #567 - Front Impact

Damage Profile Distances - Vehicle Width - Closing Speed - Trapezoidal Average

| Test Vehicle Weight = | 2929 pounds |
|-------------------------|-------------|
| Vehicle Closing Speed = | 34.8 MPH |
| Test Crush Length = | 68.0 inches |

Damage Profile Distance Collision Crush Depths (inches)

| | DPD1 | DPD2 | DPD3 | DPD4 | DPD5 | DPD6 | |
|---------------|------|------|------|------|------|------|-------------|
| (Driver Side) | 23.4 | 25.6 | 26.0 | 26.4 | 26.5 | 24.1 | (Pass Side) |

| | | CRASH | CRASH 3 Stiffness Coefficents | | | |
|----------------------------------|---------|-------|--------------------------------------|--------|----------|--|
| | | A | B | G | <u> </u> | |
| Minimum Crush = 23.4 inches | | | | | 76.4 | |
| Using a Rated No Damage Speed of | 2.5mph | 119.2 | 65.8 | 107.9 | | |
| Using a Rated No Damage Speed of | 5.0mph | 219.9 | 56.0 | 431.7 | | |
| Using a Rated No Damage Speed of | 7.5mph | 302.2 | 47.0 | 971.4 | | |
| Using a Rated No Damage Speed of | 10.0mph | 366.0 | 38.8 | 1726.9 | | |
| Average Crush = 25.6 inches | | | | | 63.8 | |
| Using a Rated No Damage Speed of | 2.5mph | 108.9 | 55.0 | 107.9 | | |
| Using a Rated No Damage Speed of | 5.0mph | 201.0 | 46.8 | 431.7 | | |
| Using a Rated No Damage Speed of | 7.5mph | 276.2 | 39.3 | 971.4 | | |
| Using a Rated No Damage Speed of | 10.0mph | 334.5 | 32.4 | 1196.0 | | |
| Maximum Crush = 26.5 inches | | | | | 59.6 | |
| Using a Rated No Damage Speed of | 2.5mph | 105.2 | 51.3 | 107.9 | | |
| Using a Rated No Damage Speed of | 5.0mph | 194.2 | 43.7 | 431.7 | | |
| Using a Rated No Damage Speed of | 7.5mph | 266.8 | 36.6 | 971.4 | | |
| Using a Rated No Damage Speed of | 10.0mph | 323.2 | 30.2 | 1726.9 | | |

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation

vehicles may, however, have a higher rating

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific

A = Maximum force per inch of damage without permanent damage, Ib/in

B = Crush resistance per inch of damage width (Crash), lb/in^2

G = Energy dissipated without permanent damage, Ib

Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats KE Speed (mph) = SQRT(30 * CF * max crush in feet)

| Crush | Maximum Crush | Calculated KE Speed | Calculated Error | Calculated Error |
|--------|---------------|---------------------|------------------|------------------|
| Factor | (inches) | (mph) | (mph) | (%) |
| 21 | 26.5 | 37.3 | 2.5 | 6.7 |

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.3

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

1983 PLYMOUTH RELIANT

NHTSA Crash Test - #567 - Front Impact

Damage Profile Distances - Indention Length - Closing Speed - Trapezoidal Average

| Test Vehicle Weight = | 2929 pounds |
|-------------------------|-------------|
| Vehicle Closing Speed = | 34.8 MPH |
| Test Crush Length = | 62.5 inches |

Damage Profile Distance Collision Crush Depths (inches)

| | DPD1 | DPD2 | DPD3 | DPD4 | DPD5 | DPD6 | |
|---------------|------|------|------|------|------|------|-------------|
| (Driver Side) | 23.4 | 25.6 | 26.0 | 26.4 | 26.5 | 24.1 | (Pass Side) |

| | | CRASH | 3 Stiffness Coe | CRASH 3 Stiffness Coefficents | | | |
|----------------------------------|---------|-------|-----------------|--------------------------------------|----------|--|--|
| | | A | В | G | <u> </u> | | |
| Minimum Crush = 23.4 inches | | | | | 83.1 | | |
| Using a Rated No Damage Speed of | 2.5mph | 129.6 | 71.6 | 117.4 | | | |
| Using a Rated No Damage Speed of | 5.0mph | 239.1 | 60.9 | 469.5 | | | |
| Using a Rated No Damage Speed of | 7.5mph | 328.6 | 51.1 | 1056.4 | | | |
| Using a Rated No Damage Speed of | 10.0mph | 398.0 | 42.2 | 1878.1 | | | |
| Average Crush = 25.6 inches | | | | | 69.4 | | |
| Using a Rated No Damage Speed of | 2.5mph | 118.5 | 59.8 | 117.4 | | | |
| Using a Rated No Damage Speed of | 5.0mph | 218.6 | 50.9 | 469.5 | | | |
| Using a Rated No Damage Speed of | 7.5mph | 300.4 | 42.7 | 1056.4 | | | |
| Using a Rated No Damage Speed of | 10.0mph | 363.8 | 35.2 | 1300.7 | | | |
| Maximum Crush = 26.5 inches | | | | | 64.8 | | |
| Using a Rated No Damage Speed of | 2.5mph | 114.4 | 55.8 | 117.4 | | | |
| Using a Rated No Damage Speed of | 5.0mph | 211.2 | 47.5 | 469.5 | | | |
| Using a Rated No Damage Speed of | 7.5mph | 290.2 | 39.9 | 1056.4 | | | |
| Using a Rated No Damage Speed of | 10.0mph | 351.5 | 32.9 | 1878.1 | | | |

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation

vehicles may, however, have a higher rating

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific

A = Maximum force per inch of damage without permanent damage, Ib/in

B = Crush resistance per inch of damage width (Crash), lb/in^2

G = Energy dissipated without permanent damage, Ib

Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats KE Speed (mph) = SQRT(30 * CF * max crush in feet)

| Crush | Maximum Crush | Calculated KE Speed | Calculated Error | Calculated Error |
|--------|---------------|---------------------|------------------|------------------|
| Factor | (inches) | (mph) | (mph) | (%) |
| 21 | 26.5 | 37.3 | 2.5 | 6.7 |

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.3

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

Available Test Results Front Impact Test Summary

Report Filter Settings

Year Range: 1981 - 1989 Make: PLYMOUTH Model: RELIANT

| Test Number | Vehicle Info | No Damage Speed (mph) | Average Crush (inch) | 0 | | ehicle iffness B | | | Crush Factor |
|----------------|---------------------------------------|--------------------------------|----------------------------|------|-------|------------------------|-------|------|-----------------|
| 957 | 1985 PLYMOUTH RELIANT FOUR DOOR SEDAN | 5.0 | 30.7 | 34.5 | 170.7 | 32.8 | 444.1 | 44.9 | 15.5 |
| 502 | 1982 PLYMOUTH RELIANT TWO DOOR SEDAN | 5.0 | 17.5 | 29.5 | 199.5 | 55.9 | 356.0 | 81.0 | 19.9 |
| 567 | 1983 PLYMOUTH RELIANT STATION WAGON | 5.0 | 25.6 | 34.8 | 200.6 | 46.6 | 431.7 | 63.6 | 18.9 |
| 593 | 1983 PLYMOUTH RELIANT STATION WAGON | 5.0 | 24.9 | 35.1 | 206.0 | 49.9 | 425.1 | 67.9 | 19.8 |
| 794 | 1985 PLYMOUTH RELIANT FOUR DOOR SEDAN | 5.0 | 25.1 | 35.0 | 213.5 | 51.0 | 447.0 | 69.4 | 19.5 |
| 941 | 1981 DODGE ARIES FOUR DOOR SEDAN | 5.0 | 20.5 | 30.3 | 216.9 | 53.6 | 439.0 | 76.8 | 17.9 |
| | | Average (| AVG) | | 201.2 | 48.3 | 423.8 | 67.3 | 18.6 |
| | | Minimum | (MIN) | | 170.7 | 32.8 | 356.0 | 44.9 | 15.5 |
| | | Maximum | (MAX) | | 216.9 | 55.9 | 447.0 | 81.0 | 19.9 |
| | Standard Deviation | n (STDev-sa | mple) | | 16.5 | 8.2 | 34.2 | 12.6 | 1.7 |
| | Nu | mber of Tes | sts (n) | 6 | | | | | |

Available Test Results Front Impact Test Summary

Report Filter Settings

Year Range: 1981 - 1989 Make: PLYMOUTH Model: RELIANT

| Test Number | Vehicle Info | No Damage Speed (mph) | Max Crush (inch) | 0 | | ehicle iffness B | | | Crush Factor |
|----------------|---------------------------------------|--------------------------------|------------------------|------|-------|------------------------|-------|------|-----------------|
| 057 | | | | | | | | | |
| 957 | 1985 PLYMOUTH RELIANT FOUR DOOR SEDAN | 5.0 | 33.9 | 34.5 | 154.5 | 26.9 | 444.1 | 36.8 | 14.0 |
| 593 | 1983 PLYMOUTH RELIANT STATION WAGON | 5.0 | 26.7 | 35.1 | 191.8 | 43.3 | 425.1 | 58.8 | 18.5 |
| 502 | 1982 PLYMOUTH RELIANT TWO DOOR SEDAN | 5.0 | 18.0 | 29.5 | 194.0 | 52.9 | 356.0 | 76.6 | 19.4 |
| 567 | 1983 PLYMOUTH RELIANT STATION WAGON | 5.0 | 26.5 | 34.8 | 194.2 | 43.7 | 431.7 | 59.6 | 18.3 |
| 405 | 1981 PLYMOUTH RELIANT TWO DOOR SEDAN | 5.0 | 25.8 | 35.3 | 199.8 | 46.9 | 425.1 | 63.7 | 19.3 |
| 794 | 1985 PLYMOUTH RELIANT FOUR DOOR SEDAN | 5.0 | 26.6 | 35.0 | 201.7 | 45.5 | 447.0 | 62.0 | 18.4 |
| 941 | 1981 DODGE ARIES FOUR DOOR SEDAN | 5.0 | 21.1 | 30.3 | 210.7 | 50.6 | 439.0 | 72.5 | 17.4 |
| 207 | 1981 PLYMOUTH RELIANT TWO DOOR SEDAN | 5.0 | 23.6 | 34.9 | 221.3 | 56.1 | 436.7 | 76.4 | 20.6 |
| | | Average (| AVG) | | 196.0 | 45.7 | 425.6 | 63.3 | 18.2 |
| | | Minimum | (MIN) | | 154.5 | 26.9 | 356.0 | 36.8 | 14.0 |
| | | Maximum (| MAX) | | 221.3 | 56.1 | 447.0 | 76.6 | 20.6 |
| | Standard Deviation | n (STDev-sa | mple) | | 19.5 | 8.9 | 29.2 | 12.9 | 2.0 |
| | Nu | mber of Tes | sts (n) | 8 | | | | | |

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Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the side of the Nissan Stanza was used, with the Stiffness Values from the range of tests for the Plymouth Reliant as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on AVERAGE crush

Bumper Line Crush Damage to Stanza

| Curb Weight (poun | · · · · · · · · · · · · · · · · · · · | = | PDOF | .ever Arm Distar | ce (inches) | : | 0.00 |
|---|---------------------------------------|------------------------|-----------|------------------------|--------------|----------------|-----------------------|
| Occupant + Cargo Weight (pour Total Weight (poun | | 0 23 | Yaw N | Ioment of Inerti | a (lb-ft-sec | ²) | 1186.69 |
| | , <u> </u> | | "Known" (| Stifness Values | | | |
| Angle Coll Force to Normal (degre | , | .0 | KIIOWII S | Stilless values | А | | В |
| No Damage Speed (m | | .0 | | Average | 201.2 | | 48.3 |
| Energy Crush Depth (inch | | | | Minimum | 170.7 | | 32.8 |
| Damage Length (incl | nes): 57. | .0 | | Maximum | 216.9 | | 55.9 |
| Crush Profile Measureme | nts: | 4 | St | d. Devation | 16.5 | | 8.2 |
| | Unequal | | Zone | Area | Zone | | Area |
| | Spacing | Zone Area | Depth(x) | Depth(x) | Depth(| - | Pepth(y) |
| C1 (inches) 0.00 | (inches) | (inches ²) | (inches) | (inches ²) | (inche | | inches ²) |
| C2 (inches) 4.50 | 31.00 | 69.75 | 1.50 | | - | 0.67 | 1441.50 |
| C3 (inches) 10.00 | 22.00 | 159.50 | 3.80 | | | 1.39 | 5485.33 |
| C4 (inches) 8.00 | 4.00 | 36.00 | 4.52 | 2 162.67 | | 9.93 | 357.33 |
| C5 (inches) | | | | | | | |
| C6 (inches) | | | | | | | |
| C7 (inches) | | | | | | | |
| C8 (inches) | | | | | | | |
| C9 (inches) | | | | | | | |
| C10 (inches) | | | | | | | |
| Average Crush (inches): | 4.65 | | | | | | |
| | | | Average | | KE | | Closing |
| Results | | | Force | Damage | | Delta V | Speed |
| | А | В | (pounds) | Energy (ft*lbs) | (mph) | (mph) | (MPH) |
| Minimum | 170.7 | 32.8 | 9215.05 | 8269.83 | 10.3 | 12.5 | 22.9 |
| Avg - 2 Std. Deviations | 168.2 | 31.9 | 9024.44 | 8145.52 | 10.3 | 12.4 | 22.7 |
| Avg - 1 Std. Deviations | 184.7 | 40.1 | 10582.21 | 9021.08 | 10.8 | 13.3 | 24.2 |
| Average | 201.2 | 48.3 | 12139.99 | 9952.57 | 11.3 | 14.1 | 25.7 |
| Avg + 1 Std. Deviations | 217.7 | 56.5 | 13697.76 | 10915.63 | 11.9 | 14.9 | 27.1 |
| Avg + 2 Std. Deviations | 234.2 | 64.7 | 15255.54 | 11898.26 | 12.4 | 15.6 | 28.5 |
| Maximum | 216.9 | 55.9 | 13595.39 | 10860.90 | 11.8 | 14.8 | 27.1 |
| Damage Centroid Depth (x) (| inches) | 3.29 | | | k² [| 2368.6 | 8 |
| Damage Centroid Depth (y) (| inches) | 27.46 | | Eff. Mass Ratio (| gamma) [| 1.0 | 0 |
| Area of Damage (in | ches²): | 265.25 | | | | | |

1988 PLYMOUTH RELIANT - Front Impact

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| | ····· | | PDOF | | | |
|--|---------------------------------------|------------------------|---------------------|---------------------------|-----------------------------|---------------------|
| Curb Weight (po Occupant + Cargo Weight (pc | · · · · · · · · · · · · · · · · · · · | 0 | | _ever Arm Distan | ice (inches): | 0.00 |
| Total Weight (po | | | Yaw N | Noment of Inert | a (lb-ft-sec ²) | 1687.27 |
| ngle Coll Force to Normal (deg | grees): 0 | 0.0 | | | | |
| No Damage Speed | (mph): 2 | 2.0 | | | | |
| Energy Crush Depth (ir | nches): 11. ! | 55 | | | | |
| Damage Length (ii | nches): 96 | 5.0 | | | | |
| Crush Profile Measurer | nents: | 6 | | | | |
| | Unequal | | Zone | Area | Zone | Area |
| | Spacing | Zone Area | 1 / | Depth(x) | Depth(y) | Depth(y) |
| C1 (inches) 1.00 | (inches) | (inches ²) | | (inches²) | (inches) | (inches²) |
| C2 (inches) 17.00 | 22.00 | 198.00 |) 5.69 | | 14.26 | 2823.33 |
| C3 (inches) 27.00 | 7.00 | 154.00 |) 11.19 | 9 1723.17 | 10.77 | 1657.83 |
| C4 (inches) 5.00 | 41.00 | 656.00 | 9.2 | 6 6074.83 | 97.80 | 64158.17 |
| · · · · | 11.50 | 57.50 | 2.5 | 143.75 | 40.25 | 2314.38 |
| · · · · | 14.50 | 43.50 | 1.72 | 2 74.92 | 63.64 | 2768.29 |
| C6 (inches) 1.00 | - - - | | | | | |
| C7 (inches) | | | | | | |
| C8 (inches) | | | | |] | |
| C9 (inches) |] | | | |] [| |
| C10 (inches) |] | | | | J L | |
| Average Crush (inches): | 11.55 | | | | | |
| Results | | | Average | _ | KE | |
| Results | А | В | Force (pounds) | Damage Energy (ft*lbs) | • | lta V nph) bsub1 |
| N 41 | 35.7 | 13.5 | (pounds) 9215.05 | 13982.32 | (inpit) (ii 12.2 | 10.4 13.4 |
| Minimum | | | | | | |
| Avg - 2 Std. Deviations | 35.2 | 13.2 | 9024.44 | 13709.57 | | 10.3 13.2 |
| Avg - 1 Std. Deviations | 38.5 | 15.8 | 10582.21 | 15935.58 | 13.0 | 11.0 14.4 |
| Average | 41.5 | 18.3 | 12139.99 | 18155.56 | 13.9 | 11.6 15.5 |
| Avg + 1 Std. Deviations | 44.3 | 20.9 | 13697.76 | 20370.64 | 14.7 | 12.3 16.6 |
| Avg + 2 Std. Deviations | 46.9 | 23.5 | 15255.54 | 22581.63 | 15.5 | 12.9 17.6 |
| Maximum | 44.1 | 20.7 | 13595.39 | 20225.20 | 14.7 | 12.2 16.5 |
| Damage Centroid Depth (x | (inches) | 8.24 | | | k ² | 2785.17 |
| Damage Centroid Depth (y | /) (inches) | 66.48 | | Eff. Mass Ratio (| gamma) | 1.00 |
| Area of Damage | (inches ²): | 1109.00 | | | | |

1992 NISSAN STANZA XE - Side Impact

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To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the side of the Nissan Stanza was used, with the Stiffness Values from the range of tests for the Plymouth Reliant as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on MAXIMUM crush

Bumper Line Crush Damage to Stanza

| Curb Weight (pour | | | PDOF | _ever Arm Dista | nce (inches | s): | 0.00 |
|---|---------------------|-------------------------------------|----------------------|------------------------------------|----------------|------------------|-----------------------|
| Occupant + Cargo Weight (pour Total Weight (pour | | 0 23 | Yaw N | Noment of Iner | tia (lb-ft-seo | c ²) | 1186.69 |
| Angle Coll Force to Normal (degree | 2es)· 0 | .0 | "Known" S | Stifness Values | ; | | |
| No Damage Speed (m | | .0 | | F | А | | В |
| Energy Crush Depth (incl | = ,' | | | Average | 196.0 | | 45.7 |
| | | | | Minimum | 154.5 | 5 | 26.9 |
| Damage Length (inc | hes): 57 . | .0 | | Maximum | 221.3 | 3 | 56.1 |
| Crush Profile Measureme | ents: | 4 | St | td. Devation | 19.5 | 5 | 8.9 |
| | Unequal | | Zone | Area | Zon | | Area |
| | Spacing (inches) | Zone Area (inches ²) | Depth(x) (inches) | Depth(x) (inches ²) | Depth (inch | | Depth(y) (inches²) |
| C1 (inches) 0.00 | (incries) 31.00 | (incries) 69.75 | (incries) 1.50 | | | 20.67 | 1441.50 |
| C2 (inches) 4.50 | 22.00 | 159.50 | 3.80 | | | 4.39 | 5485.33 |
| C3 (inches) 10.00 | 4.00 | 36.00 | 4.52 | | | 9.93 | 357.33 |
| C4 (inches) 8.00 | | 50.00 |] [] | | | | |
| C5 (inches) | | | I [I [| | | L | |
| C6 (inches) | | | L | | |] [] [| |
| C7 (inches) | | | | | | | |
| C8 (inches) | | | | | | | |
| C9 (inches) | | | | | | | |
| C10 (inches) | | | | | | | |
| Average Crush (inches): | 4.65 | | | | | | |
| | | | Average | | KE | | Closing |
| Results | | | Force | Damage | Speed | Delta V | • |
| _ | A | B | (pounds) | Energy (ft*lbs) | (mph) | (mph) | (MPH) |
| Minimum | 154.5 | 26.9 | 7970.86 | 7480.04 | 9.8 | 11.8 | 21.5 |
| Avg - 2 Std. Deviations | 157.0 | 27.9 | 8174.74 | 7598.82 | 9.9 | 11.9 | 21.7 |
| Avg - 1 Std. Deviations | 176.5 | 36.8 | 9910.85 | 8589.73 | 10.5 | 12.9 | 23.6 |
| Average | 196.0 | 45.7 | 11646.96 | 9654.34 | 11.2 | 13.8 | 25.3 |
| Avg + 1 Std. Deviations | 215.5 | 54.6 | 13383.08 | 10756.61 | 11.8 | 14.7 | 26.9 |
| Avg + 2 Std. Deviations | 235.0 | 63.5 | 15119.19 | 11880.71 | 12.4 | 15.5 | 28.4 |
| Maximum | 221.3 | 56.1 | 13747.31 | 11047.21 | 11.9 | 14.9 | 27.2 |
| Damage Centroid Depth (x) (| (inches) | 3.29 | | | k² | 2368 | .68 |
| Damage Centroid Depth (y) (| (inches) | 27.46 | | Eff. Mass Ratio | (gamma) | 1 | .00 |
| Area of Damage (in | ches²): | 265.25 | | | | | |

| Curb Weight (po | ounds): 280 | 09 | PDOF | | _ | |
|-------------------------------|-------------------------|------------------------|----------|-------------------|-----------------------------|------------------------|
| Occupant + Cargo Weight (pe | | 0 | | Lever Arm Distan | | 0.00 |
| Total Weight (po | ounds): 280 | 09 | Yaw N | Noment of Inert | a (lb-ft-sec ²) | 1687.27 |
| ngle Coll Force to Normal (de | grees): 0 | 0.0 | | | | |
| No Damage Speed | (mph): 2 | 2.0 | | | | |
| Energy Crush Depth (i | nches): 11. | 55 | | | | |
| Damage Length (i | nches): 96 | 6.0 | | | | |
| Crush Profile Measure | ments: | 6 | | | | |
| Clush i folile measure | Unequal | <u> </u> | Zone | Area | Zone | Area |
| | Spacing | Zone Area | | Depth(x) | Depth(y) | Depth(y) |
| C1 (inches) 1.00 | (inches) | (inches ²) | (inches) | (inches²) | (inches) | (inches ²) |
| | _ 22.00 | 198.00 | 5.69 | 9 1125.67 | 14.26 | 2823.33 |
| C2 (inches) 17.00 | _ 7.00 | 154.00 | 11.19 | 9 1723.17 | 10.77 | 1657.83 |
| C3 (inches) 27.00 | 41.00 | 656.00 | 9.20 | 6 6074.83 | 97.80 | 64158.17 |
| C4 (inches) 5.00 | 11.50 | 57.50 | 2.50 | 0 143.75 | 40.25 | 2314.38 |
| C5 (inches) 5.00 | 14.50 | 43.50 | 1.72 | 2 74.92 | 63.64 | 2768.29 |
| C6 (inches) 1.00 | | | | | | |
| C7 (inches) | | | | | | |
| C8 (inches) | | | | | | |
| C9 (inches) | | | | | | |
| C10 (inches) | _ L | | | | | |
| Average Crush (inches): | 11.55 | | | | | |
| Poculto | | | Average | | KE | |
| Results | | _ | Force | Damage | Speed Delta | |
| | A | B | (pounds) | Energy (ft*lbs) | (mph) (mp | |
| Minimum | 32.9 | 11.5 | 7970.86 | 12199.84 | | 9.7 12.3 |
| Avg - 2 Std. Deviations | 33.4 | 11.9 | 8174.74 | 12492.29 | 11.6 | 9.8 12.5 |
| Avg - 1 Std. Deviations | 37.1 | 14.7 | 9910.85 | 14977.04 | 12.6 1 | 0.7 13.9 |
| Average | 40.5 | 17.5 | 11646.96 | 17453.53 | 13.7 1 | 1.4 15.2 |
| Avg + 1 Std. Deviations | 43.7 | 20.4 | 13383.08 | 19923.52 | 14.6 1 | 2.2 16.4 |
| Avg + 2 Std. Deviations | 46.7 | 23.2 | 15119.19 | 22388.25 | 15.5 1 | 2.9 17.5 |
| Maximum | 44.4 | 21.0 | 13747.31 | 20441.03 | 14.8 1 | 2.3 16.6 |
| Damage Centroid Depth (| x) (inches) | 8.24 | | | k ² 27 | 85.17 |
| Damage Centroid Depth (| y) (inches) | 66.48 | | Eff. Mass Ratio (| gamma) | 1.00 |
| Area of Damage | (inches ²): | 1109.00 | | | | |

1992 NISSAN STANZA XE - Side Impact

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To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the side of the Nissan Stanza was used, with the Stiffness Values from the range of tests for the Plymouth Reliant as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on AVERAGE crush

Bumper Line Crush AVERAGED with Sill Line Crush Damage to Stanza

| Curb Weight (pour | | 23 | PDOF | .ever Arm Distar | ice (inches |): | 0.00 |
|---|----------------------|------------------------|------------------|------------------------|--------------|------------------|------------------------|
| Occupant + Cargo Weight (pour Total Weight (pour | | 0 23 | Yaw N | Ioment of Inert | a (lb-ft-sec | 2 ²) | 1186.69 |
| | , | | "Known" | Stifness Values | | | |
| Angle Coll Force to Normal (degree | | .0 | KIIOWII S | Stilless values | А | | В |
| No Damage Speed (m | - /· | .0 | | Average | 201.2 | 2 | 48.3 |
| Energy Crush Depth (incl | | | | Minimum | 170.7 | <u>,</u> | 32.8 |
| Damage Length (inc | hes): 57 | .0 | | Maximum | 216.9 | <u>ب</u> | 55.9 |
| Crush Profile Measureme | ents: | 4 | St | d. Devation | 16.5 | ; | 8.2 |
| | Unequal | | Zone | Area | Zon | | Area |
| | Spacing | Zone Area | Depth(x) | Depth(x) | Depth | • | Depth(y) |
| C1 (inches) 0.00 | (inches) | (inches ²) | (inches) | (inches ²) | (inche | | (inches ²) |
| C2 (inches) 4.50 | 31.00 | 69.75 | 1.50 | | - | 0.67 | 1441.50 |
| C3 (inches) 10.00 | 22.00 | 159.50 | 3.80 | | - | 4.39 | 5485.33 |
| C4 (inches) 8.00 | 4.00 | 36.00 | 4.52 | 2 162.67 | | 9.93 | 357.33 |
| C5 (inches) | | | | | | | |
| C6 (inches) | | | | | | | |
| C7 (inches) | | | | | | | |
| C8 (inches) | | | | | | | |
| C9 (inches) | | | | | | | |
| C10 (inches) | | | | | | | |
| | 4.65 | | | | | | |
| Average Crush (inches): | 4.05 | | A | | | | Classin r |
| Results | | | Average Force | Damage | KE Speed | Delta V | Closing Speed |
| | А | В | (pounds) | Energy (ft*lbs) | (mph) | (mph) | (MPH) |
| Minimum | 170.7 | 32.8 | 9215.05 | 8269.83 | 10.3 | 11.9 | 21.7 |
| Avg - 2 Std. Deviations | 168.2 | 31.9 | 9024.44 | 8145.52 | 10.3 | 11.8 | 21.5 |
| Avg - 1 Std. Deviations | 184.7 | 40.1 | 10582.21 | 9021.08 | 10.8 | 12.6 | 23.0 |
| Average | 201.2 | 48.3 | 12139.99 | 9952.57 | 11.3 | 13.3 | 24.3 |
| Avg + 1 Std. Deviations | 217.7 | 56.5 | 13697.76 | 10915.63 | 11.9 | 14.0 | 25.7 |
| Avg + 2 Std. Deviations | 234.2 | 64.7 | 15255.54 | 11898.26 | 12.4 | 14.7 | 26.9 |
| Maximum | 216.9 | 55.9 | 13595.39 | 10860.90 | 11.8 | 14.0 | 25.6 |
| Damage Centroid Depth (x) (| (inches) | 3.29 | | | k² | 2368.6 | 8 |
| Damage Centroid Depth (y) (| (inches) | 27.46 | | Eff. Mass Ratio (| gamma) | 1.0 | 0 |
| Area of Damage (in | ches ²): | 265.25 | | | | | |

| Curb Weight (po | · · · · · · · · · · · · · · · · · · · | | PDOF | .ever Arm Distan | ce (inches): | 0.00 | | |
|--|--|--|---------------------------------------|---|--|--|--|--|
| Occupant + Cargo Weight (po Total Weight (po | | 0)9 | Yaw N | Yaw Moment of Inertia (lb-ft-sec ²) 1687. | | | | |
| Total Weight (po Ingle Coll Force to Normal (deg No Damage Speed Energy Crush Depth (ir Damage Length (ir Crush Profile Measurer C1 (inches) <u>1.00</u> C2 (inches) <u>13.00</u> C3 (inches) <u>22.50</u> | grees): 0 (mph): 2 nches): 9.8 nches): 96 ments: 96 Unequal Spacing (inches) 22.00 7.00 | .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 | Zone Depth(x) (inches) 29.09 | Area Depth(x) (inches ²) 5 671.00 9 1129.04 | Zone Depth(y) (inches) 14.14 10.81 | Area Depth(y) (inches ²) 2178.00 1343.42 | | |
| C4 (inches) 5.00 | 41.00 | 563.75 | 7.80 | | 98.15 | 55332.92 | | |
| C5 (inches) 5.00 | | 57.50 | 2.50 | | 40.25 | 2314.38 | | |
| C6 (inches) 1.00 | <u>14.50</u> | 43.50 | | 2 74.92 | 63.64 | 2768.29 | | |
| C7 (inches) | | | | | | | | |
| C8 (inches) | | | | | | | | |
| C9 (inches) | | | | | | | | |
| C10 (inches) |] | | | | | | | |
| Average Crush (inches): | 9.82 | | | | | | | |
| Results | | | Average Force | Damage | KE Speed Delta | | | |
| | A | B | (pounds) | Energy (ft*lbs) | (mph) (mp | | | |
| Minimum | 38.3 | 15.6 | 9215.05 | 11755.83 | | 9.8 14.4 | | |
| Avg - 2 Std. Deviations | 37.9 | 15.3 | 9024.44 | 11528.89 | | 9.7 14.2 | | |
| Avg - 1 Std. Deviations | 41.4 | 18.2 | 10582.21 | 13380.62 | | 0.4 15.5 | | |
| Average | 44.6 | 21.2 | 12139.99 | 15226.41 | | 1.0 16.7 | | |
| Avg + 1 Std. Deviations | 47.7 | 24.2 | 13697.76 | 17067.36 | 13.5 1 | 1.6 17.9 | | |
| Avg + 2 Std. Deviations | 50.6 | 27.2 | 15255.54 | 18904.27 | 14.2 12 | 2.2 18.9 | | |
| Maximum | 47.5 | 24.0 | 13595.39 | 16946.51 | 13.5 1 | 1.6 17.8 | | |
| Damage Centroid Depth (x | :) (inches) | 6.81 | | | k ² 278 | 85.17 | | |
| Damage Centroid Depth (y | ı) (inches) | 67.80 | | Eff. Mass Ratio (g | gamma) | 1.00 | | |
| Area of Damage | (inches²): | 943.00 | | | | | | |

1992 NISSAN STANZA XE - Side Impact

4N6XPRT Systems

Expert System Software for Litigation

8387 University Avenue La Mesa, CA 91942 Phone: (619) 464-3478 Fax: (619) 464-2206 Toll Free: 1- 800-266-9778

Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the side of the Nissan Stanza was used, with the Stiffness Values from the range of tests for the Plymouth Reliant as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on MAXIMUM crush

Bumper Line Crush AVERAGED with Sill Line Crush Damage to Stanza

| Curb Weight (pour | | = | PDOF | _ever Arm Dista | nce (inches | s): | 0.00 | | |
|--|--------------------------|-------------------------------------|--------------------------|--|----------------|------------------|--|--|--|
| Occupant + Cargo Weight (pou Total Weight (pour | | 0 23 | Yaw N | Yaw Moment of Inertia (lb-ft-sec ²) 1186.69 | | | | | |
| Angle Coll Force to Normal (degree | | .0 | "Known" | Stifness Values | | | | | |
| 5 | | | | | А | | В | | |
| No Damage Speed (m | | .0 | | Average | 196.0 | | 45.7 | | |
| Energy Crush Depth (inc | | _ | | Minimum | 154.5 | 5 | 26.9 | | |
| Damage Length (inc | hes): 57 | .0 | | Maximum | 221.3 | 3 | 56.1 | | |
| Crush Profile Measureme | ents: | 4 | St | td. Devation | 19.5 | 5 | 8.9 | | |
| | Unequal | | Zone | Area | Zon | | Area | | |
| | Spacing | Zone Area (inches ²) | Depth(x) | Depth(x) | Depth | - | Depth(y) | | |
| C1 (inches) 0.00 | (inches) 31.00 | (incries) 69.75 | (inches) 1.5 0 | (inches ²) | (inch | es) 20.67 | (inches ²) 1441.50 | | |
| C2 (inches) 4.50 | 22.00 | 159.50 | 3.80 | | | 4.39 | 5485.33 | | |
| C3 (inches) 10.00 | 4.00 | 36.00 | 4.52 | | | 9.93 | 357.33 | | |
| C4 (inches) 8.00 | 4.00 | 30.00 | 4.54 | | | <u> </u> | | | |
| C5 (inches) | | | | | | | | | |
| C6 (inches) | | | | _] [¬] [| J L 7 r | | | | |
| C7 (inches) | | | | | | | | | |
| C8 (inches) | | | | | | | | | |
| C9 (inches) | | | | | | | | | |
| C10 (inches) | | | | | | | | | |
| Average Crush (inches): | 4.65 | | | | | | | | |
| Results | | | Average | | KE | | Closing | | |
| Results | А | В | Force (pounds) | Damage Energy (ft*lbs) | Speed (mph) | Delta V (mph) | Speed (MPH) | | |
| Minimum | 154.5 | 26.9 | 7970.86 | 7480.04 | (inpii) 9.8 | (inpi) 11.2 | | | |
| | 157.0 | 27.9 | 8174.74 | 7480.04 | 9.9 | 11.3 | | | |
| Avg - 2 Std. Deviations | 137.0 | 36.8 | 9910.85 | 8589.73 | 10.5 | 11.3 | | | |
| Avg - 1 Std. Deviations | 196.0 | 45.7 | 11646.96 | 9654.34 | 11.2 | 13.1 | | | |
| Average | 215.5 | 54.6 | 13383.08 | 10756.61 | | 13.9 | | | |
| Avg + 1 Std. Deviations | 235.0 | 63.5 | 15119.19 | 11880.71 | 12.4 | 13.5 | | | |
| Avg + 2 Std. Deviations Maximum | 233.0 | 56.1 | 13747.31 | 11047.21 | 11.9 | 14.7 | | | |
| Damage Centroid Depth (x) (| | 3.29 | 19777, 3 1 | | k ² | 2368. | | | |
| Damage Centroid Depth (x) (| | 27.46 | | Eff. Mass Ratio (| | | 00 | | |
| Area of Damage (in | | 265.25 | | LII. 191835 Natio 1 | yannina) | 1 , | | | |
| Aica OI Dalliaye (III | | | | | | | | | |

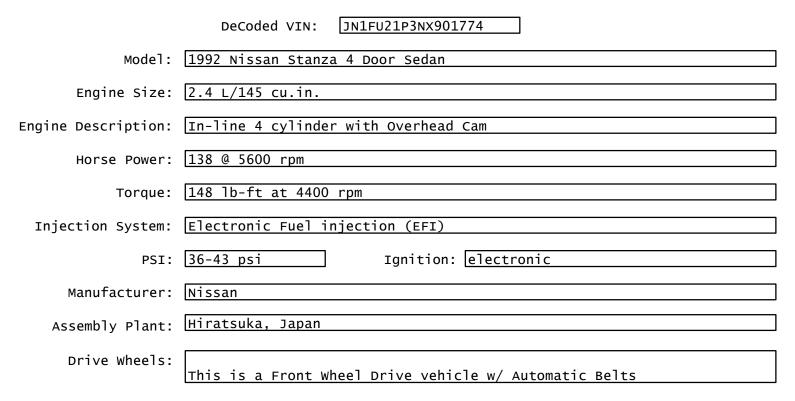
| Curb Weight (pc | · | | PDOF | .ever Arm Distan | ce (inches): | 0.00 |
|--|--|---|------------------|------------------------|-----------------------------|------------------------|
| Dccupant + Cargo Weight (po Total Weight (po | · · · · · · · · · · · · · · · · · · · | 0)9 | Yaw M | 1oment of Inerti | a (lb-ft-sec ²) | 1687.27 |
| ngle Coll Force to Normal (de No Damage Speed Energy Crush Depth (i Damage Length (i Crush Profile Measure | grees): 0 (mph): 2 nches): 9.8 nches): 96 | .0 .0 32 | Zone Depth(x) | Area Depth(x) | Zone Depth(y) | Area Depth(y) |
| C1 (inches) 1.00 | (inches) 22.00 | (inches ²) 154.00 | (inches) | (inches ²) | (inches) | (inches ²) |
| C2 (inches) 13.00 | | 124.25 | 9.09 | | 10.81 | 1343.42 |
| C3 (inches) 22.50 | | 563.75 | 7.80 | | 98.15 | 55332.92 |
| C4 (inches) 5.00 | | 57.50 | 2.50 | | 40.25 | 2314.38 |
| C5 (inches) 5.00 | | | | | | |
| C6 (inches) 1.00 | <u>14.50</u> | 43.50 |] [1.72 | 2 74.92 | 63.64 | 2768.29 |
| C7 (inches) |] [] | | | | | |
| C8 (inches) |] | | | | | |
| C9 (inches) | | | | | | |
| C10 (inches) | ┐└───┘ | | | | | |
| Average Crush (inches): | 9.82 | | | | | |
| Poculto | | | Average | | KE | |
| Results | • | P | Force | Damage | Speed Delt | |
| | A | B | · | Energy (ft*lbs) | (mph) (mj | |
| Minimum | 35.4 | 13.3 | 7970.86 | 10272.35 | 10.5 | 9.3 13.3 |
| Avg - 2 Std. Deviations | 35.9 | 13.7 | 8174.74 | 10515.79 | 10.6 | 9.3 13.4 |
| Avg - 1 Std. Deviations | 39.9 | 17.0 | 9910.85 | 12583.38 | 11.6 | 10.1 15.0 |
| Average | 43.6 | 20.3 | 11646.96 | 14642.80 | 12.5 | 10.8 16.4 |
| Avg + 1 Std. Deviations | 47.1 | 23.6 | 13383.08 | 16695.82 | 13.4 | 11.5 17.6 |
| Avg + 2 Std. Deviations | 50.3 | 27.0 | 15119.19 | 18743.63 | 14.1 | 12.2 18.9 |
| Maximum | 47.8 | 24.3 | 13747.31 | 17125.85 | 13.5 | 11.7 17.9 |
| Damage Centroid Depth (» | <) (inches) | 6.81 | | | k ² 2 | 785.17 |
| Damage Centroid Depth (| /) (inches) | 67.80 | I | Eff. Mass Ratio (| gamma) | 1.00 |
| Area of Damage | (inches ²): | 943.00 | | | | |

1992 NISSAN STANZA XE - Side Impact

Expert VIN DeCoder®

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Version Number 3.1.0.3



The First through Third characters (JN1) indicate a Nissan Car made in Japan The Fourth character (F) indicates the OEM engine: 2.4 L/145 cu.in., L4, OHC The Fifth and Sixth characters (U2) indicate a Stanza The Seventh character (1) indicates a 4 Door Sedan The Eighth character (P) indicates Automatic Belts The Ninth character (the check digit) is entered as 3. The VIN appears Valid, the calculated value is 3. The Tenth character (N) indicates the model year 1992 The Eleventh character (X) indicates the vehicle was made in the assembly plant in Hiratsuka, Japan

The Twelfth through Seventeenth characters (901774) indicate the Serial Number and are unique to this vehicle.

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PROVIDED BY: 4N6XPRT Systems 8387 University Avenue La Mesa CA 91941

7/24/2012

1992 NISSAN STANZA SE 4 DOOR SEDAN

| Curb Weight: Curb Weight Distribution - Front: | 2800 lbs. | Rear: | 270 kg. 35 % |
|--|--|--|--|
| Gross Vehicle Weight Rating: | 1bs. | | kg. |
| Number of Tires on Vehicle: Drive Wheels: | 4 FRONT | | |
| Horizontal Dimensions Total Length Wheelbase: | Inches 180 100 | Feet 15.00 8.33 | Meters 4.57 2.54 |
| Front Bumper to Front Axle: Front Bumper to Front of Front Well: Front Bumper to Front of Hood: Front Bumper to Base of Windshield: Front Bumper to Top of Windshield: | 38 21 4 51 76 | 3.17 1.75 0.33 4.25 6.33 | 0.97 0.53 0.10 1.30 1.93 |
| Rear Bumper to Rear Axle: Rear Bumper to Rear of Rear Well: Rear Bumper to Rear of Trunk: Rear Bumper to Base of Rear Window: | 42 29 7 28 | 3.50 2.42 0.58 2.33 | 1.07 0.74 0.18 0.71 |
| Width Dimensions Maximum Width: Front Track: Rear Track: | 67 58 57 | 5.58 4.83 4.75 | 1.70 1.47 1.45 |
| Vertical Dimensions Height: Ground to - | 54 | 4.50 | 1.37 |
| Front Bumper (Top) Headlight - center Hood - top front: Base of Windshield Rear Bumper - top: Trunk - top rear: Base of Rear Window: | 21 26 29 36 23 36 38 | 1.75 2.17 2.42 3.00 1.92 3.00 3.17 | 0.53 0.66 0.74 0.91 0.58 0.91 0.97 |

Expert AutoStats®

1992 NISSAN STANZA SE 4 DOOR SEDAN

| Interior Dimensions Front Seat Shoulder width Front Seat to Headliner Front Leg Room - seatback to floor (max) | Inches 55 39 43 | Feet 4.58 3.25 3.58 | Meters 1.40 0.99 1.09 |
|---|--------------------------|--|--------------------------------|
| Rear Seat Shoulder Width Rear Seat to Headliner Front Leg Room - seatback to floor (min) | 54 37 34 | 4.50 3.08 2.83 | 1.37 0.94 0.86 |
| Seatbelts: 3pt front, 2pt rear Airbags: NO AIRBAGS | | | |
| Steering Data Turning Circle (Diameter) Steering Ratio: <u>16.74:1</u> Wheel Radius: Tire Size (OEM): <u>195-65R14</u> | 468 12 | 39.00 1.00 | <u>11.89</u> 0.30 |
| Acceleration & Braking Information Brake Type: FRONT DISC - REAR DRUM ABS System: ALL WHEEL ABS - OPTIONAL Braking, 60 mph to 0 (Hard pedal, no skid, dry d = ft t = ft t = sec a = | | sec² G-for | ce = |
| Acceleration: $t = $ sec $a = $ 0 to 30mpht = sec $a = $ 0 to 60mpht = sec $a = $ 45 to 65mpht = sec $a = $ Transmission Type: | = ft/s | sec ² G-for sec ² G-for sec ² G-for | ce = |
| Notes: Federal Bumper Standard Requirements: This vehicles Rated Bumper Strength: | 2.5 mp 5 mp | | |

N.S.D.C = 1992 - 1992

1992 NISSAN STANZA SE 4 DOOR SEDAN

| Other Information | | |
|--|------|---------------------------------------|
| Tip-Over Stability Ratio = | 1.36 | Stable |
| NHTSA Star Rating (calculated) | | *** |
| Center of Gravity (No Load): | | |
| Inches behind front axle | = | 35.00 |
| Inches in front of rear axle | = | 65.00 |
| Inches from side of vehicle | = | 33.50 |
| Inches from ground | = | 21.20 |
| Inches from front corner | = | 80.32 |
| Inches from rear corner | = | 112.12 |
| Inches from front bumper | = | 73.00 |
| Inches from rear bumper | = | 107.00 |
| Moments of Inertia Approximations (No Load): | | |
| Yaw Moment of Inertia | = | 1678.00 lb*ft*sec ² |
| Pitch Moment of Inertia | = | 1623.00 lb*ft*sec ² |
| Roll Moment of Inertia | = | 354.00 1b*ft*sec ² |
| Front Profile Information | | |
| Angle Front Bumper to Hood Front | = | 63.4 deg |
| Angle Front of Hood to Windshield Base | = | 8.5 deg |
| Angle Front of Hood to Windshield Top | = | 17.7 deg |
| Angle of Windshield | = | 32.6 deg |
| Angle of Steering Tires at Max Turn | = | 24.5 deg |

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

| $V(mph) = \sqrt{(30 * CF * MID)}$ | | | |
|---|---|----|----|
| KE Equivalent Speed (Front/Rear/Side) | = | 21 | CF |
| Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY (Tested for Rear/Side Impact only) | = | 27 | CF |

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

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E-Mail: 4n6@4n6xprt.com

The NHTSA Crash Test database contains NO SIDE Impact tests for the Nissan Stanza.

To create a SIMILAR class of vehicle, we first looked at the published wheelbase for the Stanza, which is 100 inches..

We then looked at the NHTSA database for FOUR DOOR SEDANS that have SIDE IMPACT TESTS and had a wheelbase of 99-101 inches (+/- ~1 inch of the published wheelbase).

The Test Summary Reports based on the Average and Maximum crush depths follow.

| 🛱 4N6XPRT Stif | Calcs - Selected Vehicl | e: 1992 NISSAN ST | ANZA | | | | | | | |
|--|-------------------------|-------------------|--------------------|--------------------|------------|--------------|---------|------|----------------|----------------|
| File Print Repo | orts Settings Help | Reg To: 4N6XPRT | SYSTEMS | | | | | | | |
| Basic Vehicle Se | arch NHTSA Test Sel | ection Advanced | Vehicle Search For | ce Balance | | | | | | 3.1.0.10 |
| Available Tes | st Test Information | Occupant Infor | mation Vehicle Ir | nformation Stiffne | ss Calcs | | | | | |
| Available Tests in the NHTSA database for a 1987 - 1992 NISSAN STANZA | | | | | | | | | | |
| | | | Sister Clone | e Searched Yea | | | | | | |
| Print | | | | | Frontal Te | st(s) | | | | |
| Test No. | A Year | Make | Model | Impact Speed | Max Crush | Crush Factor | VDI | PDOF | Test Config | VIN |
| 1379 | 1990 | NISSAN | STANZA | 35.0 | 22.2 | 22.0 | 9999999 | 0 | VEHICLE INTO B | JN1FU21PXLT201 |
| 1384 | 1990 | NISSAN | STANZA | 29.6 | 17.6 | 19.9 | 12FDEW2 | 0 | VEHICLE INTO B | JN1FU21P7LT200 |
| 1592 | 1991 | NISSAN | STANZA | 35.1 | 24.4 | 20.2 | 9999999 | 0 | VEHICLE INTO B | JN1FU21P6MX853 |
| | | | | | | | | | | |

Rear Test(s)

No Rear Tests: 1987 - 1992

Side Test(s)

No Side Tests: 1987 - 1992

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4N6XPRT StifCalcs®

Available Test Results Side Impact Test Summary

Report Filter Settings

Bodystyle: FOUR DOOR SEDAN

Wheelbase Range: 99-101

| Test Number | Vehicle Info | No Damage Average Speed Crush | | lndention KEES Stiffness | | | | | Crush | |
|----------------|--------------------------------------|-------------------------------------|--------|------------------------------|-------|-------|------|-------|--------|--|
| | | (mph) | (inch) | (mph) | A | B | G | Kv | Factor | |
| 855 | 1983 MAZDA 626 FOUR DOOR SEDAN | 2.0 | 18.2 | 24.0 | 82.8 | 49.9 | 68.7 | 59.4 | 12.6 | |
| 2706 | 1997 NISSAN SENTRA FOUR DOOR SEDAN | 2.0 | 6.1 | 20.5 | 95.4 | 145.3 | 31.3 | 178.5 | 27.7 | |
| 2237 | 1995 SUBARU IMPREZA FOUR DOOR SEDAN | 2.0 | 10.1 | 23.6 | 95.7 | 102.0 | 44.9 | 121.7 | 22.0 | |
| 2768 | 1998 NISSAN SENTRA FOUR DOOR SEDAN | 2.0 | 9.4 | 27.2 | 102.7 | 137.8 | 38.3 | 160.5 | 31.5 | |
| 4199 | 2002 NISSAN SENTRA FOUR DOOR SEDAN | 2.0 | 8.2 | 27.4 | 113.9 | 177.5 | 36.5 | 206.5 | 36.9 | |
| 3059 | 1999 HYUNDAI ELANTRA FOUR DOOR SEDAN | 2.0 | 6.4 | 23.2 | 114.2 | 189.6 | 34.4 | 227.2 | 33.7 | |
| 3478 | 2000 KIA SEPHIA FOUR DOOR SEDAN | 2.0 | 8.6 | 27.4 | 116.5 | 172.9 | 39.2 | 201.2 | 35.1 | |
| 2812 | 1998 KIA SEPHIA FOUR DOOR SEDAN | 2.0 | 5.7 | 23.3 | 122.7 | 228.2 | 33.0 | 273.0 | 37.9 | |
| 2535 | 1997 HYUNDAI ELANTRA FOUR DOOR SEDAN | 2.0 | 5.9 | 23.3 | 126.9 | 231.1 | 34.9 | 276.4 | 37.2 | |
| 2795 | 1998 HYUNDAI ELANTRA FOUR DOOR SEDAN | 2.0 | 6.2 | 26.8 | 129.2 | 258.7 | 32.3 | 302.0 | 46.5 | |
| 2365 | 1996 NISSAN SENTRA FOUR DOOR SEDAN | 2.0 | 7.3 | 24.1 | 132.9 | 200.4 | 44.1 | 238.3 | 31.7 | |
| 2147 | 1994 SUBARU IMPREZA FOUR DOOR SEDAN | 2.0 | 11.1 | 23.6 | 136.6 | 132.7 | 70.3 | 158.5 | 20.0 | |
| 3559 | 2001 KIA SPECTRA FOUR DOOR SEDAN | 2.0 | 6.1 | 23.1 | 148.7 | 258.2 | 42.8 | 309.5 | 35.1 | |
| 4227 | 2002 TOYOTA PRIUS FOUR DOOR SEDAN | 2.0 | 6.1 | 26.7 | 158.7 | 321.1 | 39.2 | 375.3 | 46.7 | |
| 5679 | 2007 TOYOTA YARIS FOUR DOOR SEDAN | 2.0 | 5.6 | 27.7 | 160.1 | 369.7 | 34.7 | 429.4 | 55.2 | |
| 6583 | 2009 TOYOTA YARIS FOUR DOOR SEDAN | 2.0 | 4.8 | 27.6 | 183.4 | 486.8 | 34.5 | 565.7 | 63.2 | |
| 6440 | 2005 SUBARU FORESTER FOUR DOOR SEDAN | 2.0 | 7.1 | 20.0 | 219.7 | 277.9 | 86.8 | 343.0 | 22.5 | |
| 5485 | 2005 SUBARU FORESTER FOUR DOOR SEDAN | 2.0 | 5.4 | 22.4 | 285.2 | 537.4 | 75.7 | 648.0 | 37.1 | |
| | | | | | | | | | | |
| | | Average (| (AVG) | | 140.3 | 237.6 | 45.6 | 281.9 | 35.1 | |
| | | (MIN) | | 82.8 | 49.9 | 31.3 | 59.4 | 12.6 | | |
| | I | Maximum | (MAX) | | 285.2 | 537.4 | 86.8 | 648.0 | 63.2 | |
| | Standard Deviation | (STDev-sa | ample) | | 49.3 | 126.9 | 17.1 | 150.1 | 12.4 | |
| | Nun | sts (n) | 18 | | | | | | | |

Registrered Owner: 4N6XPRT SYSTEMS

Year Range: 1965 - 2011

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Serial Number: 11R-030201SC01301

4N6XPRT StifCalcs®

Available Test Results Side Impact Test Summary

Report Filter Settings

Bodystyle: FOUR DOOR SEDAN

Wheelbase Range: 99-101

| Test Numbe | Vehicle r Info | No Damage Speed | Max Crush | | | lention iffness | Valu | e s | Crush |
|---------------|--------------------------------------|-----------------------|--------------|-------|-------|--------------------|------|-------|--------|
| | | (mph) | (inch) | (mph) | Α | В | G | Kv | Factor |
| 2706 | 1997 NISSAN SENTRA FOUR DOOR SEDAN | 2.0 | 14.8 | 20.5 | 39.0 | 24.3 | 31.3 | 29.8 | 11.3 |
| 3059 | 1999 HYUNDAI ELANTRA FOUR DOOR SEDAN | 2.0 | 13.7 | 23.2 | 52.9 | 40.8 | 34.4 | 48.8 | 15.6 |
| 2795 | 1998 HYUNDAI ELANTRA FOUR DOOR SEDAN | 2.0 | 14.6 | 26.8 | 55.0 | 46.9 | 32.3 | 54.8 | 19.8 |
| 2768 | 1998 NISSAN SENTRA FOUR DOOR SEDAN | 2.0 | 16.4 | 27.2 | 58.9 | 45.3 | 38.3 | 52.7 | 18.1 |
| 2812 | 1998 KIA SEPHIA FOUR DOOR SEDAN | 2.0 | 11.8 | 23.3 | 59.7 | 54.0 | 33.0 | 64.6 | 18.5 |
| 2535 | 1997 HYUNDAI ELANTRA FOUR DOOR SEDAN | 2.0 | 12.2 | 23.3 | 60.7 | 52.9 | 34.9 | 63.3 | 17.8 |
| 4199 | 2002 NISSAN SENTRA FOUR DOOR SEDAN | 2.0 | 14.3 | 27.4 | 64.8 | 57.5 | 36.5 | 66.9 | 21.0 |
| 3478 | 2000 KIA SEPHIA FOUR DOOR SEDAN | 2.0 | 14.9 | 27.4 | 67.0 | 57.2 | 39.2 | 66.6 | 20.2 |
| 855 | 1983 MAZDA 626 FOUR DOOR SEDAN | 2.0 | 22.3 | 24.0 | 67.7 | 33.3 | 68.7 | 39.7 | 10.3 |
| 3559 | 2001 KIA SPECTRA FOUR DOOR SEDAN | 2.0 | 11.7 | 23.1 | 77.0 | 69.1 | 42.8 | 82.9 | 18.2 |
| 4227 | 2002 TOYOTA PRIUS FOUR DOOR SEDAN | 2.0 | 12.2 | 26.7 | 79.6 | 80.7 | 39.2 | 94.3 | 23.4 |
| 2365 | 1996 NISSAN SENTRA FOUR DOOR SEDAN | 2.0 | 12.1 | 24.1 | 80.7 | 73.9 | 44.1 | 87.8 | 19.3 |
| 2237 | 1995 SUBARU IMPREZA FOUR DOOR SEDAN | 2.0 | 12.0 | 23.6 | 80.8 | 72.7 | 44.9 | 86.8 | 18.6 |
| 5679 | 2007 TOYOTA YARIS FOUR DOOR SEDAN | 2.0 | 9.6 | 27.7 | 92.8 | 124.3 | 34.7 | 144.4 | 32.0 |
| 6583 | 2009 TOYOTA YARIS FOUR DOOR SEDAN | 2.0 | 9.5 | 27.6 | 92.9 | 124.9 | 34.5 | 145.2 | 32.0 |
| 6440 | 2005 SUBARU FORESTER FOUR DOOR SEDAN | 2.0 | 15.0 | 20.0 | 104.2 | 62.6 | 86.8 | 77.2 | 10.7 |
| 2147 | 1994 SUBARU IMPREZA FOUR DOOR SEDAN | 2.0 | 14.5 | 23.6 | 104.6 | 77.8 | 70.3 | 92.9 | 15.3 |
| 5485 | 2005 SUBARU FORESTER FOUR DOOR SEDAN | 2.0 | 7.4 | 22.4 | 209.5 | 290.1 | 75.7 | 349.8 | 27.2 |
| | | | | | | | | | |
| | | Average (| AVG) | | 80.4 | 77.1 | 45.6 | 91.6 | 19.4 |
| | Minimum (MIN) | | | | 39.0 | 24.3 | 31.3 | 29.8 | 10.3 |
| | 1 | Maximum | (MAX) | | 209.5 | 290.1 | 86.8 | 349.8 | 32.0 |
| | Standard Deviation | (STDev-sa | imple) | | 36.9 | 59.4 | 17.1 | 71.4 | 6.2 |
| | Number of Tests (n) | | | | | | | | |

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To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the front of the Plymouth Reliant was used, with the Stiffness Values from the range of tests for the Nissan Stanza CLASS as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on AVERAGE crush

Bumper Line Crush Damage to Stanza

| 1992 MISSAN STAN | | | | | | | | | |
|---|----------|-----------|-------------------|--|----------------|------------------|----------------|--|--|
| Curb Weight (pour | | 00 | PDOF | ever Arm Distanc | e (inches): | : | 0.00 | | |
| Occupant + Cargo Weight (pour Total Weight (pour | | 0 | Yaw N | Yaw Moment of Inertia (lb-ft-sec ²) 1678.00 | | | | | |
| . . | | _ | | | | | | | |
| Angle Coll Force to Normal (degree | / | .0 | "Known" S | Stifness Values | А | I | 3 | | |
| No Damage Speed (m | iph): 2 | .0 | | Average | 140.3 | | 237.6 | | |
| Energy Crush Depth (incl | | Minimum | 82.8 | | 49.9 | | | | |
| Damage Length (inc | hes): 96 | .0 | | Maximum 285.2 537.4 | | | | | |
| Crush Profile Measureme | ents: | 6 | St | td. Devation | 49.3 | | 126.9 | | |
| | Zone | Area | Zone | | Area | | | | |
| | Spacing | Zone Area | Depth(x) | Depth(x) | Depth(y | y) De | epth(y) | | |
| C1 (inches) 1.00 | (inches) | (inches²) | (inches) | (inches²) | (inches | s) (i | nches²) | | |
| C2 (inches) 17.00 | 22.00 | 198.00 | 5.69 | 1125.67 | 14 | .26 | 2823.33 | | |
| C3 (inches) 27.00 | 7.00 | 154.00 | 11.19 | 1723.17 | 10 |).77 | 1657.83 | | |
| C4 (inches) 5.00 | 41.00 | 656.00 | 9.26 | 6074.83 | 97 | .80 | 64158.17 | | |
| | 11.50 | 57.50 | 2.50 | 143.75 | 40 | .25 | 2314.38 | | |
| | 14.50 | 36.25 | 1.67 | 60.42 | 62 | 2.83 | 2277.71 | | |
| | | | | | | | | | |
| C7 (inches) | | | | | | | | | |
| C8 (inches) | | | | | | | | | |
| C9 (inches) | | | | | | | | | |
| C10 (inches) | | | | | | | | | |
| Average Crush (inches): | 11.48 | | | | | | | | |
| Results | | | Average | Damage | KE | Dalka V | Closing | | |
| | А | В | Force (pounds) | Damage Energy (ft*lbs) | Speed (mph) | Delta V (mph) | Speed (MPH) | | |
| Minimum | 82.8 | 49.9 | 31463.06 | 46108.21 | 22.2 | 18.1 | 39.9 | | |
| Avg - 2 Std. Deviations | 41.7 | -16.2 | N/A | N/A | N/A | N/A | N/A | | |
| Avg - 1 Std. Deviations | 91.0 | 110.7 | 65349.86 | 92858.42 | 31.5 | 25.5 | 56.3 | | |
| Average | 140.3 | 237.6 | 137622.30 | 193943.78 | 45.6 | 36.6 | 80.8 | | |
| Avg + 1 Std. Deviations | 189.6 | 364.5 | 209894.74 | 295060.08 | 56.2 | 45.1 | 99.4 | | |
| Avg + 2 Std. Deviations | 238.9 | 491.4 | 282167.18 | 396183.36 | 65.2 | 52.2 | 115.0 | | |
| Maximum | 285.2 | 537.4 | 309729.83 | 435565.15 | 68.3 | 54.6 | 120.5 | | |
| Damage Centroid Depth (x) (| inches) | 8.28 | | | k² | 2778.77 | · _ | | |
| Damage Centroid Depth (y) (| inches) | 66.47 | | Eff. Mass Ratio (g | amma) | 1.00 | | | |
| Area of Damage (in | ches²): | 1101.75 | | | | | | | |

1992 NISSAN STANZA SE - Side Impact

| | | - | • | | | | |
|--------------------------------|-----------------------|-----------|-------------------|---------------------------|----------------|------------------|---------|
| Curb Weight (pou | | | PDOF | Lever Arm Distan | ice (inches) |): | 0.00 |
| Occupant + Cargo Weight (pou | - | 0 | | Aoment of Inerti | | | 1186.69 |
| Total Weight (pou | inds): 232 | 23 | | | | , <u> </u> | |
| ngle Coll Force to Normal (deg | rees): | 0.0 | | | | | |
| No Damage Speed (r | mph): 5 | 5.0 | | | | | |
| Energy Crush Depth (in | ches): 4. | 65 | | | | | |
| Damage Length (in | ches): 57 | 7.0 | | | | | |
| Crush Profile Measurem | ients: | 4 | | | | | |
| | Unequal | | Zone | Area | Zone | 9 | Area |
| | Spacing | Zone Area | Depth(x) | Depth(x) | Depth | (y) De | epth(y) |
| C1 (inches) 0.00 | (inches) | (inches²) | (inches) | (inches ²) | (inche | es) (ii | nches²) |
| C2 (inches) 4.50 | 31.00 | 69.75 | 5 1.50 | 0 104.63 | 2 | 0.67 | 1441.50 |
| C3 (inches) 10.00 | 22.00 | 159.50 | 3.80 | 0 605.92 | 34 | 4.39 | 5485.33 |
| | 4.00 | 36.00 |) 4.52 | 2 162.67 | | 9.93 | 357.33 |
| , , <u> </u> | | | | | | | |
| C5 (inches) | | | | | | | |
| C6 (inches) | | | | | | | |
| C7 (inches) | | | | | | | |
| C8 (inches) | | | | | | | |
| C9 (inches) | | | | | | | |
| C10 (inches) | , | | | | _ | | |
| Average Crush (inches): | 4.65 | | | | | | |
| Results | | | Average | Damage | KE | Data | |
| | А | В | Force (pounds) | Damage Energy (ft*lbs) | Speed (mph) | Delta V (mph) | bsub1 |
| Minimum | 361.4 | 159.7 | 31463.06 | 21550.35 | 16.7 | 21.8 | 38.9 |
| Avg - 2 Std. Deviations | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Avg - 1 Std. Deviations | 553.1 | 374.2 | 65349.86 | 41394.87 | 23.1 | 30.8 | 59.5 |
| Average | 837.7 | 858.3 | 137622.30 | 82915.76 | 32.7 | 44.2 | 90.2 |
| Avg + 1 Std. Deviations | 1053.4 | 1357.3 | 209894.74 | 123991.93 | 40.0 | 54.3 | 113.4 |
| Avg + 2 Std. Deviations | 1234.4 | 1863.7 | 282167.18 | 164843.87 | 46.1 | 62.9 | 132.9 |
| Maximum | 1297.2 | 2058.2 | 309729.83 | 180383.52 | 48.3 | 65.9 | 139.6 |
| – Damage Centroid Depth (x) | (inches) | 3.29 | | | k² | 2368.68 | |
| Damage Centroid Depth (y) | (inches) | 27.46 | | Eff. Mass Ratio (| gamma) | 1.00 | |
| Area of Damage (i | nches ²): | 265.25 | | | | | |

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To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the front of the Plymouth Reliant was used, with the Stiffness Values from the range of tests for the Nissan Stanza CLASS as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on AVERAGE crush

Bumper Line Crush AVERAGED with Sill Line Crush Damage to Stanza

| 1992 MISSAN STAN | NZA SE - S | nue mp | | | | | | | |
|--|-----------------------------------|-----------|-----------|--|------------|---------|----------|--|--|
| Curb Weight (pou | | | PDOF | _ever Arm Distan | ce (inches |): | 0.00 | | |
| Occupant + Cargo Weight (po Total Weight (pou | | 0 | Yaw N | Yaw Moment of Inertia (lb-ft-sec ²) 1678.00 | | | | | |
| | , <u> </u> | _ | | | | | | | |
| Angle Coll Force to Normal (deg | | .0 | Known | Stifness Values | А | | В | | |
| | No Damage Speed (mph): 2.0 | | | | | | 237.6 | | |
| | Energy Crush Depth (inches): 9.75 | | | | | | 49.9 | | |
| Damage Length (ir | nches): 96 | .0 | | Maximum 285.2 537.4 | | | | | |
| Crush Profile Measuren | Crush Profile Measurements: 6 | | | | 49.3 | | 126.9 | | |
| | Unequal | | Zone | Area | Zone | e | Area | | |
| | Spacing | Zone Area | Depth(x) | Depth(x) | Depth | • | epth(y) | | |
| C1 (inches) 1.00 | (inches) | (inches²) | (inches) | (inches²) | (inche | | nches²) | | |
| C2 (inches) 13.00 | 22.00 | 154.00 | 4.30 | | | 4.14 | 2178.00 | | |
| C3 (inches) 22.50 | 7.00 | 124.25 | 9.09 | | | 0.81 | 1343.42 | | |
| C4 (inches) 5.00 | 41.00 | 563.75 | 7.80 | | | | 55332.92 | | |
| C5 (inches) 5.00 | 11.50 | 57.50 | 2.50 | | | 0.25 | 2314.38 | | |
| C6 (inches) 0.00 | 14.50 | 36.25 | 1.6 | 7 60.42 | 6 | 2.83 | 2277.71 | | |
| C7 (inches) | | | | | | | | | |
| C8 (inches) | | | | | | | | | |
| C9 (inches) | | | | | | | | | |
| C10 (inches) | | | | | | | | | |
| Average Crush (inches): | 9.75 | | | | | | | | |
| Doculto | | | Average | | KE | | Closing | | |
| Results | | _ | Force | Damage | Speed | Delta V | Speed | | |
| | A | B | (pounds) | Energy (ft*lbs) | (mph) | (mph) | (MPH) | | |
| Minimum | 82.8 | 49.9 | 27321.36 | 33632.74 | 19.0 | 16.5 | 36.4 | | |
| Avg - 2 Std. Deviations | 41.7 | -16.2 | N/A | N/A | N/A | N/A | N/A | | |
| Avg - 1 Std. Deviations | 91.0 | 110.7 | 56161.76 | 66464.54 | 26.7 | 23.2 | 51.1 | | |
| Average | 140.3 | 237.6 | 117901.50 | 138054.56 | 38.5 | 33.3 | 73.4 | | |
| Avg + 1 Std. Deviations | 189.6 | 364.5 | 179641.24 | 209675.53 | 47.4 | 41.0 | 90.4 | | |
| Avg + 2 Std. Deviations | 238.9 | 491.4 | 241380.98 | 281303.47 | 54.9 | 47.4 | 104.6 | | |
| Maximum | 285.2 | 537.4 | 265125.63 | 309600.23 | 57.6 | 49.7 | 109.7 | | |
| Damage Centroid Depth (x) |) (inches) | 6.84 | | | k² | 2778.77 | 1 | | |
| Damage Centroid Depth (y) |) (inches) | 67.80 | | Eff. Mass Ratio (g | jamma) | 1.00 |) | | |
| Area of Damage (| inches²): | 935.75 | | | | | | | |

1992 NISSAN STANZA SE - Side Impact

| Curb Weight (pounds): 2323 | PDOF | | | |
|---|------------------------------|------------------------|-------------------------|-----------|
| Occupant + Cargo Weight (pounds): | | Lever Arm Distance (| | 0.00 |
| Total Weight (pounds): 2323 | Yaw N | Moment of Inertia (lk | o-ft-sec ²) | 1186.69 |
| Angle Coll Force to Normal (degrees): 0.0 | | | | |
| No Damage Speed (mph): 5.0 | | | | |
| Energy Crush Depth (inches): 3.43 | | | | |
| Damage Length (inches): 57.0 | | | | |
| Crush Profile Measurements: 4 | | | | |
| Unequal | Zone | Area | Zone | Area |
| 1 5 | e Area Depth(x) | Depth(x) | | Depth(y) |
| C1 (inches) 0.00 | ches ²) (inches) | (inches ²) | (inches) | (inches²) |
| C2 (inches) 4.50 | 69.75 1.50 | | 20.67 | 1441.50 |
| C3 (inches) 10.00 | 159.50 3.80 | | 34.39 | 5485.33 |
| C4 (inches) 8.00 4.00 | 36.00 4.52 | 2 162.67 | 9.93 | 357.33 |
| C5 (inches) | | | | |
| C6 (inches) | | | | |
| C7 (inches) | | | | |
| C8 (inches) | | | | |
| C9 (inches) | | | | |
| C10 (inches) | | | | |
| Average Crush (inches): 4.65 | | | | |
| Results | Average | | KE | |
| A B | Force (pounds) | | need Delta V (mph) | bsub1 |
| | 0.6 27321.36 | 22612.20 | 17.1 19.9 | |
| | I/A N/A | N/A | N/A N/A | |
| Avg - 1 Std. Deviations 576.5 40 | | 44261.95 | 23.9 27.9 | 62.0 |
| | 9.3 117901.50 | 90492.88 | 34.2 40.1 | |
| Avg + 1 Std. Deviations 1112.4 151 | | 136658.87 | 42.0 49.4 | |
| Avg + 2 Std. Deviations 1306.7 208 | | 182791.94 | 48.6 57.2 | |
| Maximum 1374.7 231 | | 200528.41 | 50.9 59.9 | |
| Damage Centroid Depth (x) (inches) 3.2 | | _ | k ² 2368. | |
| Damage Centroid Depth (y) (inches) 27.4 | _ | Eff. Mass Ratio (gam | | 00 |
| Area of Damage (inches ²): 265.2 | | | | |

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A FORCE-BALANCE approach for calculating stiffness values for the front of the Plymouth Reliant was used, with the Stiffness Values from the range of tests for the Nissan Stanza CLASS as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on AVERAGE crush

Bumper Line Crush with C2 and C3 measured at Sill Line Crush for Damage to Stanza

| 1992 NISSAN STAN | | | | | | | | | |
|---|------------|------------------------|------------------|--|-------------|---------|------------------|--|--|
| Curb Weight (por | | | PDOF | _ever Arm Distan | ce (inches |): | 0.00 | | |
| Occupant + Cargo Weight (po Total Weight (po | | 0 | Yaw N | Yaw Moment of Inertia (lb-ft-sec ²) 1678.00 | | | | | |
| | , <u> </u> | | | | | | | | |
| Angle Coll Force to Normal (deg | , <u> </u> | .0 | "Known" | "Known" Stifness Values A B | | | | | |
| No Damage Speed (| | .0 | | Average | 140.3 | | 237.6 | | |
| Energy Crush Depth (in | | Minimum | 82.8 | | 49.9 | | | | |
| Damage Length (ir | nches): 96 | .0 | | Maximum | 285.2 | 2 | 537.4 | | |
| Crush Profile Measuren | nents: | 6 | S | td. Devation | 49.3 | | 126.9 | | |
| | Unequal | | Zone | Area | Zone | e | Area | | |
| | Spacing | Zone Area | Depth(x) | Depth(x) | Depth | • | epth(y) | | |
| C1 (inches) 1.00 | (inches) | (inches ²) | (inches) | (inches ²) | (inche | , | nches²) | | |
| C2 (inches) 9.00 | 22.00 | 110.00 | 3.03 | | | 3.93 | 1532.67 | | |
| C3 (inches) 18.00 | 7.00 | 94.50 | | 0 661.50 | | 0.89 | 1029.00 | | |
| C4 (inches) 5.00 | 41.00 | 471.50 | 6.30 | <u> </u> | 9 | 8.64 | 46507.67 | | |
| C5 (inches) 5.00 | 11.50 | 57.50 | 2.50 | 143.75 | 4 | 0.25 | 2314.38 | | |
| C6 (inches) 0.00 | 14.50 | 36.25 | 1.67 | 60.42 | 6 | 2.83 | 2277.71 | | |
| C7 (inches) | | | | | | | | | |
| C8 (inches) | | | | | | | | | |
| C9 (inches) | | | | | | | | | |
| C10 (inches) | | | | | | | | | |
| | 8.02 | | | | | | | | |
| Average Crush (inches): | 8.02 | | A | | | | Cha aire ar | | |
| Results | | | Average Force | Damage | KE Speed | Delta V | Closing Speed | | |
| | А | В | (pounds) | Energy (ft*lbs) | (mph) | (mph) | (MPH) | | |
| Minimum | 82.8 | 49.9 | 23179.66 | 23322.38 | 15.8 | 14.4 | 31.8 | | |
| Avg - 2 Std. Deviations | 41.7 | -16.2 | N/A | N/A | N/A | N/A | N/A | | |
| Avg - 1 Std. Deviations | 91.0 | 110.7 | 46973.66 | 44873.81 | 21.9 | 20.0 | 44.0 | | |
| Average | 140.3 | 237.6 | 98180.70 | 92474.54 | 31.5 | 28.6 | 63.0 | | |
| Avg + 1 Std. Deviations | 189.6 | 364.5 | 149387.74 | 140106.23 | 38.7 | 35.1 | 77.4 | | |
| Avg + 2 Std. Deviations | 238.9 | 491.4 | 200594.78 | 187744.89 | 44.9 | 40.6 | 89.5 | | |
| Maximum | 285.2 | 537.4 | 220521.43 | 206952.50 | 47.1 | 42.6 | 93.9 | | |
| Damage Centroid Depth (x |) (inches) | 5.46 | | | k² | 2778.77 | · _ | | |
| Damage Centroid Depth (y |) (inches) | 69.71 | | Eff. Mass Ratio (| gamma) | 1.00 | | | |
| Area of Damage (| inches²): | 769.75 | | | | | | | |

1992 NISSAN STANZA SE - Side Impact

| Curb Weight (pou Occupant + Cargo Weight (pou Total Weight (pou Angle Coll Force to Normal (degr No Damage Speed (n | 23 0 23 0.0 | | -ever Arm Distan ∕loment of Inertia | | 0.00 1186.69 | |
|--|---|---|--|--------------------|--|------------|
| Energy Crush Depth (inc Damage Length (inc | | 43 7.0 | | | | |
| Crush Profile Measurem C1 (inches) 0.00 C2 (inches) 4.50 C3 (inches) 10.00 C4 (inches) 8.00 C5 (inches) 0 C6 (inches) 0 C7 (inches) 0 C8 (inches) 0 C10 (inches) 0 Average Crush (inches): 0 | ents: Unequal Spacing (inches) 31.00 22.00 4.00 | 4 Zone Area (inches ²) 69.7 159.5 36.0 36.0 10 10 10 10 10 10 10 10 10 10 10 10 10 |) (inches) 5 1.50 0 3.80 | 0 605.92 | Zone Depth(y) (inches) 20.6 34.3 9.9 9.9 | 9 5485.33 |
| Results | 1.05 | | Average Force | Damage | KE Speed De | elta V |
| | A | В | (pounds) | Energy (ft*lbs) | (mph) (r | mph) bsub1 |
| Minimum | 337.0 | 138.9 | 23179.66 | 19496.60 | 15.9 | 17.4 36.3 |
| Avg - 2 Std. Deviations | N/A | N/A | N/A | N/A | N/A | N/A N/A |
| Avg - 1 Std. Deviations | 518.9 | 329.3 | 46973.66 | 37370.94 | 22.0 | 24.1 55.8 |
| Average | 794.8 | 772.7 | 98180.70 | 75735.73 | 31.3 | 34.4 85.5 |
| Avg + 1 Std. Deviations | 1005.0 | 1235.3 | 149387.74 | 114042.06 | 38.4 | 42.3 108.2 |
| Avg + 2 Std. Deviations | 1181.6 | 1707.6 | 200594.78 | 152318.63 | 44.4 | 48.9 127.2 |
| Maximum | 1244.2 | 1893.2 | 220521.43 | 167208.05 | 46.5 | 51.3 133.9 |
| Damage Centroid Depth (x) | (inches) | 3.29 | | | k² | 2368.68 |
| Damage Centroid Depth (y) | (inches) | 27.46 | | Eff. Mass Ratio (g | gamma) | 1.00 |
| Area of Damage (ir | nches²): | 265.25 | | | | |

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A FORCE-BALANCE approach for calculating stiffness values for the front of the Plymouth Reliant was used, with the Stiffness Values from the range of tests for the Nissan Stanza CLASS as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on MAXIMUM crush

Bumper Line Crush Damage to Stanza

| 1992 NISSAN STAN | | nae mih | | | | | | | |
|---------------------------------|---------------------|------------------------|----------------------|------------------------|----------------------|----------------------|-----------------------|--|--|
| Curb Weight (pou | | 00 | PDOF | Lever Arm Distan | ce (inches | 5): | 0.00 | | |
| Occupant + Cargo Weight (por | - | 0 | | Moment of Inerti | - | | 1678.00 | | |
| Total Weight (pou | unds): 280 | 00 | | | | | | | |
| Angle Coll Force to Normal (deg | rees): 0 | .0 | "Known" | Stifness Values | А | | В | | |
| No Damage Speed (| mph): 2 | 2.0 | | Average | 80.4 | | 77.1 | | |
| Energy Crush Depth (in | ches): 11. 4 | 18 | | Minimum | 39.(| ס | 24.3 | | |
| Damage Length (in | ches): 96 | .0 | | Maximum | 209.5 | | 290.1 | | |
| | . [| 6 | S | td. Devation | 36.9 | | 59.4 | | |
| Crush Profile Measurem | Zone | | Zon | | | | | | |
| | Unequal Spacing | Zone Area | | Area Depth(x) | Depth | | Area epth(y) | | |
| | (inches) | (inches ²) | • • • • | (inches ²) | (inch | | inches ²) | | |
| C1 (inches) 1.00 | 22.00 | 198.00 | 5.6 | 9 1125.67 | | 4.26 | 2823.33 | | |
| C2 (inches) 17.00 | 7.00 | 154.00 |) 11.1 | 9 1723.17 | | L0.77 | 1657.83 | | |
| C3 (inches) 27.00 | 41.00 | 656.00 | 9.2 | 6 6074.83 | 9 | 97.80 | 64158.17 | | |
| C4 (inches) 5.00 | 11.50 | 57.50 |) 2.5 | 0 143.75 | 4 | 10.25 | 2314.38 | | |
| C5 (inches) 5.00 | 14.50 | 36.25 | 5 1.6 | 7 60.42 | 6 | 52.83 | 2277.71 | | |
| C6 (inches) 0.00 | | | | | | | | | |
| C7 (inches) | | | | |] [| | | | |
| C8 (inches) | | | | |] | | | | |
| C9 (inches) | | | | | 」 | | | | |
| C10 (inches) | | | | |] | | | | |
| Average Crush (inches): | 11.48 | | | | | | | | |
| Results | | | Average | | KE | | Closing | | |
| Results | А | В | Force (pounds) | Damage | Speed | Delta V | Speed (MPH) | | |
| Minimum [| 39.0 | 24.3 | (pounds) 15258.26 | Energy (ft*lbs) | (mph) 15.5 | (mph) 13.2 | (IVIP II) | | |
| Minimum L | | | | | | | | | |
| Avg - 2 Std. Deviations | 6.6 | -41.7 | N/A | N/A | N/A | N/A | N/A | | |
| Avg - 1 Std. Deviations | 43.5 | 17.7 | 11838.49 | 17885.03 | 13.8 | 11.8 | 26.1 | | |
| Average | 80.4 | 77.1 | 46331.66 | 66363.42 | 26.7 | 22.4 | 49.3 | | |
| Avg + 1 Std. Deviations | 117.3 | 136.5 | 80824.84 | 115001.91 | 35.1 | 29.4 | 64.7 | | |
| Avg + 2 Std. Deviations | 154.2 | 195.9 | 115318.01 | 163654.87 | 41.9 | 35.0 | 77.1 | | |
| Maximum | 209.5 | 290.1 | 169864.84 | 240505.26 | 50.8 | 42.3 | 93.4 | | |
| Damage Centroid Depth (x) | (inches) | 8.28 | | k ² 2778.77 | | | | | |
| Damage Centroid Depth (y) | (inches) | 66.47 | | Eff. Mass Ratio (| gamma) | 1.00 | <u>ס</u> | | |
| Area of Damage (i | inches²): | 1101.75 | | | | | | | |

1992 NISSAN STANZA SE - Side Impact

| Curb Weight (pounds): 2323 | 1 | PDOF | | <i>(</i> ,) | 、 | |
|--|------------------------|-----------|------------------------|--------------|------------------|-----------------------|
| Occupant + Cargo Weight (pounds): |] | | ever Arm Distan | | | 0.00 |
| Total Weight (pounds): 2323 |] | Yaw N | 1oment of Inerti | a (lb-ft-sec | C ²) | 1186.69 |
| Angle Coll Force to Normal (degrees): 0.0 |] | | | | | |
| No Damage Speed (mph): 5.0 |] | | | | | |
| Energy Crush Depth (inches): 3.43 |] | | | | | |
| Damage Length (inches): 57.0 |] | | | | | |
| Crush Profile Measurements: 4 |] | | | | | |
| Unequal | | Zone | Area | Zon | e | Area |
| 1 5 | Zone Area | Depth(x) | Depth(x) | Depth | • | epth(y) |
| C1 (inches) 0.00 (inches) | (inches ²) | (inches) | (inches ²) | (inch | | inches ²) |
| C2 (inches) 4.50 31.00 | 69.75 |]1.50 | | | 0.67 | 1441.50 |
| C3 (inches) 10.00 | 159.50 | 3.80 | | | 4.39 | 5485.33 |
| C4 (inches) 8.00 4.00 | 36.00 | 4.52 | 162.67 | | 9.93 | 357.33 |
| C5 (inches) | | | | | | |
| C6 (inches) | | | | | | |
| C7 (inches) | | | | | | |
| C8 (inches) | | | | | | |
| C9 (inches) | | | | | | |
| C10 (inches) | | | | | | |
| Average Crush (inches): 4.65 | | | | | | |
| Deculte | | Average | | KE | | |
| Results | _ | Force | Damage | Speed | Delta V | |
| A | B | | Energy (ft*lbs) | (mph) | (mph) | bsub1 |
| Minimum 257.4 | 81.0 | 15258.26 | 13529.07 | 13.2 | 15.9 | 27.7 |
| Avg - 2 Std. Deviations N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Avg - 1 Std. Deviations | 57.8 | 11838.49 | 10947.68 | 11.9 | 14.3 | 23.4 |
| Average 514.6 | 323.9 | 46331.66 | 36889.27 | 21.8 | 27.0 | 55.4 |
| Avg + 1 Std. Deviations 711.6 | 619.4 | 80824.84 | 62741.73 | 28.5 | 35.4 | 76.6 |
| Avg + 2 Std. Deviations 870.1 | 926.0 | 115318.01 | 88560.02 | 33.8 | 42.1 | 93.7 |
| Maximum 1078.7 | 1423.2 | 169864.84 | 129351.20 | 40.9 | 51.0 | 116.1 |
| Damage Centroid Depth (x) (inches) | 3.29 | | | k² | 2368.68 | 3 |
| Damage Centroid Depth (y) (inches) | 27.46 | E | Eff. Mass Ratio (| gamma) | 1.00 |) |
| Area of Damage (inches ²): 26 | 65.25 | | | | | |

<u>4N6XPRT Systems</u>

Expert System Software for Litigation

8387 University Avenue La Mesa, CA 91942 Phone: (619) 464-3478 Fax: (619) 464-2206 Toll Free: 1- 800-266-9778

Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the front of the Plymouth Reliant was used, with the Stiffness Values from the range of tests for the Nissan Stanza CLASS as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on MAXIMUM crush

Bumper Line Crush AVERAGED with Sill Line Crush Damage to Stanza

| Curb Weight (pou Occupant + Cargo Weight (pou | | 0 | | ever Arm Distar | | | 0.00 | | |
|--|--------------------|------------------------|---|----------------------------|-----------|-----------|------------------------|--|--|
| Total Weight (pou | nds): 280 | 0 | Yaw Moment of Inertia (lb-ft-sec ²) 1678.00 | | | | | | |
| Angle Coll Force to Normal (degr | ees): 0 | .0 | "Known" S | Stifness Values | ٨ | | P | | |
| No Damage Speed (n | nph): 2 | .0 | | Average | A 80.4 | | B 77.1 | | |
| Energy Crush Depth (inc | :hes): 9.7 | ′5 | | Minimum 39.0 24.3 | | | | | |
| Damage Length (ind | ches): 96 | .0 | | Maximum 209.5 290.1 | | | | | |
| | | 6 | St | d. Devation | 36.9 | 36.9 59.4 | | | |
| Crush Profile Measurem | | 0 | Zone | Area | Zone | | Area | | |
| | Unequal Spacing | Zone Area | Depth(x) | Depth(x) | Depth | | Depth(y) | | |
| | (inches) | (inches ²) | (inches) | (inches ²) | (inche | | (inches ²) | | |
| C1 (inches) 1.00 | 22.00 | 154.00 | 4.36 | 671.00 |] [1 | 4.14 | 2178.00 | | |
| C2 (inches) 13.00 | 7.00 | 124.25 | 9.09 | 1129.04 | | 0.81 | 1343.42 | | |
| C3 (inches) 22.50 | 41.00 | 563.75 | 7.80 | 4398.96 | 9 | 8.15 | 55332.92 | | |
| C4 (inches) 5.00 | 11.50 | 57.50 | 2.50 | 143.75 | 4 | 0.25 | 2314.38 | | |
| C5 (inches) 5.00 | 14.50 | 36.25 | 1.67 | 60.42 | 6 | 2.83 | 2277.71 | | |
| C6 (inches) 0.00 | | | | |] [] | | | | |
| C7 (inches) | | | | | | | | | |
| C8 (inches) | | | | | 」 ヿ | | | | |
| C9 (inches) | | | | |] [| | | | |
| C10 (inches) | | | | | | | | | |
| Average Crush (inches): | 9.75 | | | | | | | | |
| Results | | / | Average | | KE | | Closing | | |
| Results | ٨ | D | Force | Damage | Speed | Delta V | Speed | | |
| Г | A | | (pounds) | Energy (ft*lbs) | (mph) | (mph) | (MPH) | | |
| Minimum _ | 39.0 | 24.3 | 13241.36 | 16257.97 | 13.2 | 11.7 | | | |
| Avg - 2 Std. Deviations | 6.6 | -41.7 | N/A | N/A | N/A | N/A | | | |
| Avg - 1 Std. Deviations | 43.5 | 17.7 | 10369.39 | 13264.39 | 11.9 | 10.6 | | | |
| Average | 80.4 | 77.1 | 39932.36 | 47745.24 | 22.6 | 19.7 | 43.4 | | |
| Avg + 1 Std. Deviations | 117.3 | 136.5 | 69495.34 | 82386.18 | 29.7 | 25.7 | 56.8 | | |
| Avg + 2 Std. Deviations | 154.2 | 195.9 | 99058.31 | 117041.59 | 35.4 | 30.6 | 67.5 | | |
| Maximum | 209.5 | 290.1 | 145786.54 | 171738.36 | 42.9 | 37.0 | 81.7 | | |
| Damage Centroid Depth (x) | (inches) | 6.84 | | | k² | 2778. | 77 | | |
| Damage Centroid Depth (y) | (inches) | 67.80 | I | Eff. Mass Ratio (| gamma) | 1. | 00 | | |
| Area of Damage (ir | nches²): | 935.75 | | | | | | | |

1992 NISSAN STANZA SE - Side Impact

| Curb Weight (pound | (s): 2323 | PDOF | | | |
|-------------------------------------|-----------------------------------|-----------|--------------------|---------------------------|-----------|
| Occupant + Cargo Weight (pound | - , · | | ever Arm Distanc | | 0.00 |
| Total Weight (pound | ls): 2323 | Yaw N | loment of Inertia | (lb-ft-sec ²) | 1186.69 |
| Angle Coll Force to Normal (degrees | s): 0.0 | | | | |
| No Damage Speed (mp | h): 5.0 | | | | |
| Energy Crush Depth (inche | es): 3.43 | | | | |
| Damage Length (inche | es): 57.0 | | | | |
| Crush Profile Measuremen | ts: 4 | | | | |
| | Unequal | Zone | Area | Zone | Area |
| | Spacing Zone Are | | Depth(x) | Depth(y) | Depth(y) |
| C1 (inches) 0.00 | (inches) (inches ² | | (inches²) | (inches) | (inches²) |
| C2 (inches) 4.50 | 31.00 69.7 | | | 20.67 | 1441.50 |
| C3 (inches) 10.00 | 22.00 159.5 | | | 34.39 | 5485.33 |
| C4 (inches) 8.00 | 4.00 36.0 | 0 4.52 | 162.67 | 9.93 | 357.33 |
| C5 (inches) | | | | | |
| C6 (inches) | | | | | |
| C7 (inches) | | | | | |
| C8 (inches) | | | | | |
| C9 (inches) | | | | | |
| C10 (inches) | | | | | |
| Average Crush (inches): | 4.65 | | | | |
| | | Average | | KE | |
| Results | | Force | Damage | Speed Delta | V |
| | A B | (pounds) | Energy (ft*lbs) | (mph) (mph | n) bsub1 |
| Minimum | 234.3 67.1 | 13241.36 | 12007.12 | 12.5 14 | .1 25.2 |
| Avg - 2 Std. Deviations | N/A N/A | N/A | N/A | N/A N | /A N/A |
| Avg - 1 Std. Deviations | 198.5 48.2 | 10369.39 | 9837.37 | 11.3 12 | .8 21.4 |
| Average | 470.9 271.2 | 39932.36 | 32086.64 | 20.4 23 | 50.7 |
| Avg + 1 Std. Deviations | 652.5 520.7 | 69495.34 | 54255.27 | 26.5 31 | .0 70.2 |
| Avg + 2 Std. Deviations | 798.8 780.5 | 99058.31 | 76392.60 | 31.4 36 | .9 86.0 |
| Maximum | 991.5 1202.3 | 145786.54 | 111349.28 | 37.9 44 | .7 106.7 |
| Damage Centroid Depth (x) (in | iches) 3.29 | | | k ² 236 | 8.68 |
| Damage Centroid Depth (y) (in | iches) 27.46 | E | Eff. Mass Ratio (g | amma) | 1.00 |
| Area of Damage (incl | hes ²): 265.25 | | | | |

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E-Mail: 4n6@4n6xprt.com

To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the front of the Plymouth Reliant was used, with the Stiffness Values from the range of tests for the Nissan Stanza CLASS as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on MAXIMUM crush

Bumper Line Crush with C2 and C3 measured at Sill Line Crush for Damage to Stanza

| Curb Weight (poun | ds): 280 | | PDOF | | | |] | | |
|-----------------------------------|------------------|------------------------|-----------|---|-------------|---------|------------------------|--|--|
| Occupant + Cargo Weight (pour | | 0 | | ever Arm Distan | ice (inches | 5): | 0.00 | | |
| Total Weight (poun | | 10 | Yaw N | Yaw Moment of Inertia (lb-ft-sec ²) 1678.00 | | | | | |
| Angle Coll Force to Normal (degre | es): 0 | .0 | "Known" S | Stifness Values | • | | | | |
| No Damage Speed (m | ph): 2 | .0 | | Average | A 80.4 | | B 77.1 | | |
| Energy Crush Depth (inch | nes): 8.0 | 2 | | | | | | | |
| Damage Length (incl | | .0 | | | | | | | |
| | | | | Maximum 209.5 290. | | | | | |
| Crush Profile Measureme | nts: | 6 | St | d. Devation | 36.9 | | 59.4 | | |
| | Unequal | | Zone | Area | Zon | | Area | | |
| | Spacing | Zone Area | Depth(x) | Depth(x) | Depth | - | Depth(y) | | |
| C1 (inches) 1.00 | (inches) | (inches ²) | (inches) | (inches ²) | (inch | | (inches ²) | | |
| C2 (inches) 9.00 | 22.00 | 110.00 | 3.03 | | - | .3.93 | 1532.67 | | |
| C3 (inches) 18.00 | 7.00 | 94.50 | 7.00 | 661.50 | | .0.89 | 1029.00 | | |
| C4 (inches) 5.00 | 41.00 | 471.50 | 6.30 | 2999.83 | 9 | 8.64 | 46507.67 | | |
| | 11.50 | 57.50 | 2.50 | 143.75 | 4 | 0.25 | 2314.38 | | |
| C5 (inches) 5.00 | 14.50 | 36.25 | 1.67 | 60.42 | 6 | 2.83 | 2277.71 | | |
| C6 (inches) 0.00 | | |] | |] [| | | | |
| C7 (inches) | | |] [| |] [| | | | |
| C8 (inches) | | |] [] | | 」 | | | | |
| C9 (inches) | | | 」 」 | | 」 [」 [| | | | |
| C10 (inches) | | | | | | | | | |
| Average Crush (inches): | 8.02 | | | | | | | | |
| Doculto | | | Average | | KE | | Closing | | |
| Results | | _ | Force | Damage | Speed | Delta V | Speed | | |
| _ | A | B | (pounds) | Energy (ft*lbs) | (mph) | (mph) | (MPH) | | |
| Minimum | 39.0 | 24.3 | 11224.46 | 11255.37 | 11.0 | 10.3 | 22.6 | | |
| Avg - 2 Std. Deviations | 6.6 | -41.7 | N/A | N/A | N/A | N/A | N/A | | |
| Avg - 1 Std. Deviations | 43.5 | 17.7 | 8900.29 | 9411.74 | 10.0 | 9.4 | 20.7 | | |
| Average | 80.4 | 77.1 | 33533.06 | 32472.34 | 18.7 | 17.0 | 37.5 | | |
| Avg + 1 Std. Deviations | 117.3 | 136.5 | 58165.84 | 55693.03 | 24.4 | 22.2 | 48.9 | | |
| Avg + 2 Std. Deviations | 154.2 | 195.9 | 82798.61 | 78928.19 | 29.1 | 26.3 | 58.1 | | |
| Maximum | 209.5 | 290.1 | 121708.24 | 115558.58 | 35.2 | 31.8 | 70.2 | | |
| Damage Centroid Depth (x) (i | inches) | 5.46 | | | k² | 2778.7 | 7 | | |
| Damage Centroid Depth (y) (i | inches) | 69.71 | | Eff. Mass Ratio (| gamma) | 1.0 | 00 | | |
| Area of Damage (in | ches²): | 769.75 | | | | | | | |

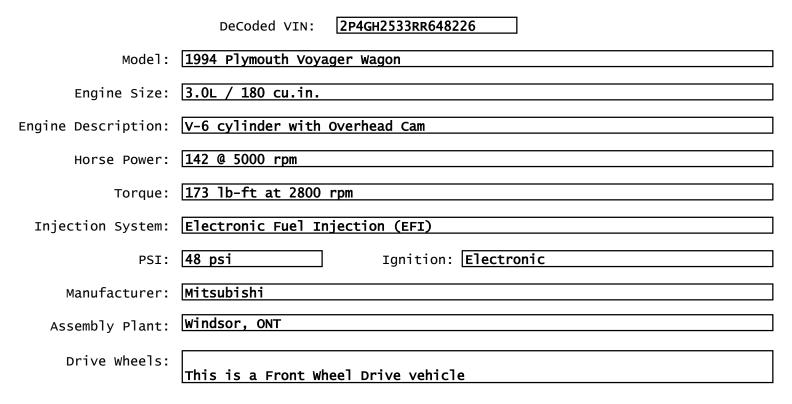
1992 NISSAN STANZA SE - Side Impact

| | | | • | | | | |
|--|------------------|--|------------|--|--------------|---------|----------|
| Curb Weight (pour | PDOF | PDOF Lever Arm Distance (inches): 0.00 | | | | | |
| Occupant + Cargo Weight (pounds): 0 Total Weight (pounds): 2323 | | | Yaw N | Yaw Moment of Inertia (lb-ft-sec ²) 1186.69 | | | |
| Total Weight (pour | ius). 23 | | | | | | |
| Angle Coll Force to Normal (degre | ees): | 0.0 | | | | | |
| No Damage Speed (m | nph): | 5.0 | | | | | |
| Energy Crush Depth (inc | hes): 3 . | .43 | | | | | |
| Damage Length (inc | :hes): 57 | 7.0 | | | | | |
| Crush Profile Measureme | ents: | 4 | | | | | |
| | Unequal | <u> </u> | Zone | Area | Zon | e | Area |
| | Spacing | Zone Are | | Depth(x) | Depth | | Depth(y) |
| C1 (inches) 0.00 | (inches) | (inches ² |) (inches) | (inches ²) | (inch | es) (| inches²) |
| | 31.00 | 69.7 | 5 1.5 | 0 104.63 | 2 | 0.67 | 1441.50 |
| | 22.00 | 159.5 | 0 3.8 | 0 605.92 | 3 | 4.39 | 5485.33 |
| C3 (inches) 10.00 | 4.00 | 36.0 | 0 4.52 | 2 162.67 | | 9.93 | 357.33 |
| C4 (inches) 8.00 | | | | | | | |
| C5 (inches) | | | | | | | |
| C6 (inches) | |] | | | | | |
| C7 (inches) | |] [| | |] | | |
| C8 (inches) | |] | | | 」 ヿ ┌──── | | |
| C9 (inches) | |) [] [| | | 」 」 | | |
| C10 (inches) | |] [| | | | | |
| Average Crush (inches): | 4.65 | | | | | | |
| Results | | | Average | | KE | | |
| Results | ٨ | D | Force | Damage | Speed | Delta V | baub 1 |
| | A | B | (pounds) | Energy (ft*lbs) | (mph) | (mph) | bsub1 |
| Minimum | 209.6 | 53.7 | 11224.46 | 10483.73 | 11.6 | 12.4 | 22.6 |
| Avg - 2 Std. Deviations | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Avg - 1 Std. Deviations | 178.6 | 39.0 | 8900.29 | 8726.01 | 10.6 | 11.3 | 19.2 |
| Average | 423.7 | 219.5 | 33533.06 | 27280.90 | 18.8 | 20.5 | 45.6 |
| Avg + 1 Std. Deviations | 588.4 | 423.5 | 58165.84 | 45764.44 | 24.3 | 26.7 | 63.3 |
| Avg + 2 Std. Deviations | 721.5 | 636.7 | 82798.61 | 64219.83 | 28.8 | 31.8 | 77.7 |
| Maximum | 896.8 | 983.6 | 121708.24 | 93340.73 | 34.7 | 38.4 | 96.5 |
| Damage Centroid Depth (x) | (inches) | 3.29 | | | k² | 2368.6 | 8 |
| Damage Centroid Depth (y) | (inches) | 27.46 | | Eff. Mass Ratio (| gamma) | 1.0 | 0 |
| Area of Damage (in | nches²): | 265.25 | | | | | |

Expert VIN DeCoder®

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Version Number 3.1.0.3



The First through Third characters (2P4) indicate a Plymouth MPV made in Canada

The Fourth character (G) indicates a GVWR of 5001-6000 lbs.

The Fifth through Seventh characters (H25) indicate a Voyager

The Eighth character (3) indicates the OEM engine: 3.0L / 180 cu.in., V6, OHC

The Ninth character (the check digit) is entered as 3. The VIN appears Valid, the calculated value is 3.

The Tenth character (R) indicates the model year 1994

The Eleventh character (R) indicates the vehicle was made in the assembly plant in Windsor, ONT

The Twelfth through Seventeenth characters (648226) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

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PROVIDED BY: 4N6XPRT Systems 8387 University Avenue La Mesa CA 91941

7/24/2012

1994 PLYMOUTH VOYAGER 2WD 3 DOOR MINI VAN

| Curb Weight: Curb Weight Distribution - Front: | 3000 1bs. 59 % | Rear: | 1361 kg. 41 % |
|--|---|--|--|
| Gross Vehicle Weight Rating: | 5100 lbs. | | 2 313 kg. |
| Number of Tires on Vehicle: Drive Wheels: | 4 FRONT | | |
| Horizontal Dimensions Total Length Wheelbase: | Inches 178 112 | Feet 14.83 9.33 | Meters 4.52 2.84 |
| Front Bumper to Front Axle: Front Bumper to Front of Front Well: Front Bumper to Front of Hood: Front Bumper to Base of Windshield: Front Bumper to Top of Windshield: | 31 18 3 41 67 | 2.58 1.50 0.25 3.42 5.58 | 0.79 0.46 0.08 1.04 1.70 |
| Rear Bumper to Rear Axle: Rear Bumper to Rear of Rear Well: Rear Bumper to Rear of Trunk: Rear Bumper to Base of Rear Window: | 35 19 3 4 | 2.92 1.58 0.25 0.33 | 0.89 0.48 0.08 0.10 |
| Width Dimensions Maximum Width: Front Track: Rear Track: | 72 60 62 | 6.00 5.00 5.17 | 1.83 1.52 1.57 |
| Vertical Dimensions Height: Ground to - | 66 | 5.50 | 1.68 |
| Front Bumper (Top) Headlight - center Hood - top front: Base of Windshield Rear Bumper - top: Trunk - top rear: Base of Rear Window: | 23 30 36 46 23 35 43 | 1.92 2.50 3.00 3.83 1.92 2.92 3.58 | 0.58 0.76 0.91 1.17 0.58 0.89 1.09 |

1994 PLYMOUTH VOYAGER 2WD 3 DOOR MINI VAN

| Interior Dimensions Front Seat Shoulder W Front Seat to Headlin Front Leg Room - seat | ner | Inches 58 40 39 | Feet 4.83 3.33 3.25 | Meters 1.47 1.02 0.99 |
|---|---|---|----------------------|----------------------------------|
| Rear Seat Shoulder W Rear Seat to Headling Front Leg Room - sea | er | 61 38 31 | 5.08 3.17 2.58 | 1.55 0.97 0.79 |
| | P & SHOULDER - front, N SIDE AIRBAGS | None or Unknown - | rear | |
| Steering Data Turning Circle (Diamo Steering Ratio: Wheel Radius: Tire Size (OEM): | eter) 17.17:1 195-75R14 | <u>516</u> <u>13</u> | 43.00 | <u>13.11</u> 0.33 |
| Acceleration & Braking Brake Type: FRONT ABS System: ABS UN | DISC - REAR DRUM | | | |
| d = 143.0 ft | (Hard pedal, no skid, t = <u>3.3</u> sec | dry pavement): a = -27.0 ft/s | ec² G | -force = -0.84 |
| Acceleration: O to 30mph O to 60mph 45 to 65mph | t = sec t =sec t =sec | a = ft/s a = ft/s a = ft/s | sec² G | -force = -force = -force = |
| Transmission Type: | AUTOMATIC | | | |
| | ndard Requirements: d Bumper Strength: | No Requiremen 5 mp | | |

N.S.D.C = 1992 - 1995

1994 PLYMOUTH VOYAGER 2WD 3 DOOR MINI VAN

| Other Information | | |
|--|------|---------------------------------------|
| Tip-Over Stability Ratio = | 1.18 | Reasonably Stable |
| NHTSA Star Rating (calculated) | | *** |
| Center of Gravity (No Load): | | |
| Inches behind front axle | = | 45.92 |
| Inches in front of rear axle | = | 66.08 |
| Inches from side of vehicle | = | 36.00 |
| Inches from ground | = | 25.84 |
| Inches from front corner | = | 84.93 |
| Inches from rear corner | = | 107.30 |
| Inches from front bumper | = | 76.92 |
| Inches from rear bumper | = | 101.08 |
| Moments of Inertia Approximations (No Load): | | |
| Yaw Moment of Inertia | = | 1747.00 lb*ft*sec ² |
| Pitch Moment of Inertia | = | 1703.00 lb*ft*sec ² |
| Roll Moment of Inertia | = | 425.00 lb*ft*sec ² |
| Front Profile Information | | |
| Angle Front Bumper to Hood Front | = | 77.0 deg |
| Angle Front of Hood to Windshield Base | = | 14.7 deg |
| Angle Front of Hood to Windshield Top | = | 23.6 deg |
| Angle of Windshield | = | 34.7 deg |
| Angle of Steering Tires at Max Turn | = | 24.9 deg |

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

| $V(mph) = \sqrt{(30 * CF * MID)}$ | | | |
|---|---|----|----|
| KE Equivalent Speed (Front/Rear/Side) | = | 21 | CF |
| Bullet vehicle IMPACT SPEED estimation based on TARGET VEHICLE damage ONLY (Tested for Rear/Side Impact only) | = | 27 | CF |

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

NHTSA Crash Test #1983

1994 DODGE CARAVAN

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS 8387 UNIVERSITY AVENUE LA MESA CA 91941-3842 11R-030201SC01301

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Sister/Clone database reader

You entered: 1994 PLYMOUTH VOYAGER

The Sister/Clone Vehicle Year/Model Interchange list indicates the following are Similar Models

| Year Range | Make | Model | Body Styles | Wheelbase |
|-------------------------|----------|----------------|--------------|--------------|
| 1991 - 1995 Remarks: | PLYMOUTH | VOYAGER | MiniVan, VAN | 112, 127 |
| 1991 - 1992 Remarks: | CHRYSLER | TOWN & COUNTRY | SW, VAN | 121.2, 119.3 |
| 1991 - 1995 Remarks: | DODGE | CARAVAN | VAN | 113.3, 119.3 |
| 1993 - 1995 Remarks: | CHRYSLER | TOWN & COUNTRY | SW, VAN | 121.2, 119.3 |
| 1991 - 1995 Remarks: | DODGE | GRAND CARAVAN | VAN | 121.2 |
| 1991 - 1995 Remarks: | PLYMOUTH | GRAND VOYAGER | VAN | 96.9 |

The data contained in the database has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. 4N6XPRT Systems® has made no changes to this data, and has only provided for distribution of this data free of charge. 4N6XPRT Systems® makes no warranties, either expressed or implied, with respect to this data, its quality, performance, merchantability, or fitness for any particular purpose. The entire risk as to its quality and performance is with the user. In no event will 4N6XPRT Systems® be liable for direct, indirect, incidental, or consequential damages resulting from any data presented here, even if 4N6XPRT Systems® has been advised of the possibility of such damages. The user must agree to assume full responsibility for any decisions which are based, in whole or in part, upon information obtained by using this data. As previously stated, the data has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. Mr. Anderson does not in any way guarantee the accuracy of the data. Some of the listed similarities are based on his own estimates or memory. Most of the data are pulled from specification tables which may contain inaccuracies of their own. Use common sense - if something seems wrong, check it (and if it is wrong, let him know!).

If you have suggestions, corrections, etc., you should contact Greg Anderson at Scalia Safety Engineering, 521 East Washington Avenue, Suite 200, Madison, WI 53703-2914, (608) 256-0820, FAX (608) 256-0212, E-mail: greganderson@cs.com.

Test Information

| | _ | | | | | | | |
|----------------------|-------------|-----------------|-------------|--------------|----------------|---------|-------------|--------|
| Test # 1983 | | NHTSA Test F | Reference G | uide Version | # 2 | | | |
| Test Date 1993-09-29 | 9 | | | Contract | # DTNH22-90- | D-22121 | | |
| Contract/Study Title | 1994 DODG | E CARAVAN INT | o flat fro | ONTAL BAR | RIER | | | |
| Test Objective(s) | OBTAIN 35 | MPH NEW CAR A | ASSESSMEN | NT AND RES | EARCH DATA | | | |
| Test Type | NEW CAR A | SSESSMENT TES | Т | | Configuration | VEHICLE | INTO BARRIE | R |
| Impact Angle | 0 | | Sid | le Impact Po | int 0 | mm | 0.0 | inches |
| | | | | | 0 | mm | 0.0 | inches |
| | | | | Closing Spe | ed 56.5 | Km/Hr | 35.11 | MPH |
| Test Performer | TRC OF OHI | 0 | | | | | | |
| Test Reference # | 930929 | | | | | | | |
| Test Track Surface | CONCRETE | | | Conditic | on DRY | | | |
| Ambient Temperature | 21 C | 69.8 F | Total Nur | mber of Curv | es 83 | | | |
| Data Recorder Type | FM MULTIPI | LEXOR TAPE RECO | ORDER | | Data Link | UMBILI | CAL CABLE | |
| Test Commentary | NO COMME | NTS | | | | | | |

Fixed Barrier Information

| Barrier Type | RIGID | Pole Barrier Diameter 0 | mm | 0 | inches |
|--------------------|-------------------|--------------------------------|----|---|--------|
| Barrier Shape | LOAD CELL BARRIER | |] | | |
| Barrier Commentary | NO COMMENTS | | | | |

1994 DODGE CARAVAN LEFT FRONT SEAT OCCUPANT

| Vehicle # | Test # | 1983 | |
|--|------------|--|--|
| Position CENTER POSITION Height mm 0.0 inches Type HYBRID III DUMMY Weight 0.0 kg 0 pounds Size 50 PERCENTILE Calibration Method HYBRID III Occupant Manufacturer HUMANOID SYSTEMS S/N 142 Occupant Modification Occupant Description NO COMMENTS Occupant Description NO COMMENTS Occupant Commentary HEAD & CHEST CONTACTED AIRBAG Head to - Windshielder Header 439 mm 17.3 inches Head Injury Criteria (HIC) 514 Windshield 603 mm 23.7 inches Head Injury Criteria (HIC) 514 Windshield 603 mm 0.0 inches HIC Lower Time Interval (ms) 56.16 Side Header 251 mm 9.3 inches Side Window 338 mm 13.3 inches Neck to Seatback 0 mm 0.0 inches First Contact Region (Head) Second Contact Region (Head) Chest Chest to - Dash 493 mm 19.4 inches Arm to Door 85 mm 3.3 inches Steering Wheel 274 mm 10.8 inches Steering Wheel 274 mm 10.8 inches Steering Wheel 274 mm 10.8 inches Steering Wheel 253 Percervent (Head) Chest Chest so- Dash 493 mm 19.4 inches Arm to Door 85 mm 3.3 inches Steering Wheel 274 mm 10.8 inches Steering Wheel 274 mm 10.8 inches Steering Wheel 274 mm 10.8 inches Steering Wheel 253 Percervent Index 534 Percervent (Index 535 Percervent (Index 533 Pounde Force Shoulder Beit Peak Load 5130 Newtons 1153.3 pound Force First Contact Region (Chest/Abdomen)AIR BAG Second Contact Region (Legs) DASHPANEL | Vehicle # | 1 | Sex MALE |
| Type HYBRID III DUMMY Weight 0,0 kg 0 pounds Size 50 PERCENTLE Calibration Method Occupant Manufacturer HUMANOID SYSTEMS S/N 142 Occupant Manufacturer Commentary HEAD & CHEST CONTACTED AIRBAG Occupant Commentary HEAD & CHEST CONTACTED AIRBAG Occupant Commentary HEAD & CHEST CONTACTED AIRBAG Mead to - Windshielder Header 439 mm 17.3 inches Head Injury Criteria (HIC) 514 Windshield 603 mm 23.7 inches HIC Lower Time Interval (ms) 56.16 Seatback 0 mm 0.0 inches HIC Upper Time Interval (ms) 92.16 Side Header 251 mm 9.9 inches Side Window 338 mm 13.3 inches Neck to Seatback 0 mm 0.0 inches First Contact Region (Head) AIR BAG Second Contact Region (Head) Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Seatback 0 mm 0.0 inches Chest I o- Dash 493 mm 19.4 inches Arm to Door 85 mm 3.3 inches Steering Wheel 274 mm 10.8 inches Steering Wheel 274 mm 10.8 inches Chest Severity Index 534 Pelvic Peak Lateral Acceleration (g's) 51.3 Lap Belt Peak Load 5130 Newtons 1153.3 pound Force Shoulder Belt Peak Load 5130 Newtons 1153.3 pound Force First Contact Region (Chest/Abdomen)AIR BAG Second Contact Region (Chest/Abdomen)AIR BAG Sec | Location | LEFT FRONT SE | Age 0 |
| Size <u>50 PERCENTILE</u> Calibration Method <u>HYBRID III</u> Occupant Manufacturer Cocupant Modification <u>UNMODIFIED</u> Occupant Description <u>NO COMMENTS</u> Occupant Commentary <u>HEAD & CHEST CONTACTED AIRBAG</u> Head to - Windshielder Header <u>439</u> mm <u>17.3</u> inches Head Injury Criteria (HIC) <u>514</u> Windshield <u>603</u> mm <u>23.7</u> inches HIC Lower Time Interval (ms) <u>56.16</u> Seatback 0 mm <u>0.0</u> inches HIC Lower Time Interval (ms) <u>56.16</u> Side Header <u>251</u> mm <u>9.9</u> inches Side Window <u>338</u> mm <u>13.3</u> inches Neck to Seatback 0 mm <u>0.0</u> inches First Contact Region (Head) <u>AIR BAG</u> Second Contact Region (Head) Chest Contact Region (Head) Seatback 0 mm <u>0.0</u> inches First Contact Region (Head) <u>Chest Arm to Door <u>85</u> mm <u>3.3</u> inches Steering Wheel <u>274</u> mm <u>10.8</u> inches Hip to Door <u>111</u> mm <u>4.4</u> inches Seatback 0 mm <u>0.0</u> inches Chest Seatback 0 mm <u>0.0</u> inches Chest Severity Index <u>534</u> Pelvic Peak Lateral Acceleration (g's) Thoracic Trauma Index Thorax Peak Acceleration (g's) <u>51.3</u> Lap Belt Peak Load <u>5130</u> Newtons <u>1153.3</u> pound Force First Contact Region (Chest/Abdomen)AIR BAG Second Contact Region (Chest/Abd</u> | Position | CENTER POSITI | ION Height 0 mm 0.0 inches |
| Calibration Method HYBRID III Occupant Manufacturer HUMANOID SYSTEMS S/N 142 Occupant Description Occupant Description Occupant Description Occupant Commentary HEAD & CHEST CONTACTED AIRBAG Head to - Windshielder Header 439 mm 17.3 inches Head Injury Criteria (HIC) 514 Windshielde 603 mm 23.7 inches HIC Lower Time Interval (ms) 56.16 Seatback 0 mm 0.0 inches HIC Upper Time Interval (ms) 92.16 Side Header [251 mm 9.9 inches Side Window 338 mm 13.3 inches Neck to Seatback 0 mm 0.0 inches First Contact Region (Head) AIR BAG Second Contact Region (Head) AIR BAG Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Seatback 0 mm 0.0 inches First Contact Region (Head) First Contact Region (Head First Contact Region (Head) First Contact Region (Head First Contact Region (Head First Contact Region (Chest/Abdomen) AIR BAG Second Contact Region (Chest/A | Туре | HYBRID III DUMI | MY Weight 0.0 kg 0 pounds |
| Occupant Manufacturer HUMANOID SYSTEMS S/N 142 Occupant Modification UNMODIFIED Occupant Description NO COMMENTS Occupant Commentary HEAD & CHEST CONTACTED AIRBAG Head to - WindShield 603 mm 23.7 inches WindShield 603 mm 23.7 inches Head Injury Criteria (HIC) 514 WindShield 603 mm 23.7 inches HIC Lower Time Interval (ms) 56.16 Seatback 0 mm 0.0 inches HIC Upper Time Interval (ms) 92.16 Side Header [251 mm 9.9 inches Side Window 338 mm 13.3 inches Neck to Seatback 0 mm 0.0 inches HIC Upper Time Interval (ms) 92.16 Side Window 338 mm 13.3 inches First Contact Region (Head) Chest Chest Second Contact Region (Head) AIR BAG Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Steering Wheel 534 Pelvic Peak Lateral Acceleration (g's) Thorax Peak Acceleration (g's) 51.3 Lap Belt Peak Load 5130 Newtons 1153.3 pound Force Shoulder Belt Peak Load 5130 Newtons 1182.2 pound Force First Contact Region (Chest/Abdomen) AIR BAG Second Contact Region (Chest/Abdomen) NONE Le | Size | 50 PERCENTILE | |
| Occupant Modification UNMODIFIED Occupant Description NO COMMENTS Occupant Commentary HEAD & CHEST CONTACTED AIRBAG Head Head Head Head to - Windshield Fleader 439 Windshield 603 mm Satback mm MindShield 603 Satback mm MindShield 603 Satback mm MindShield 603 Satback mm MindShield 603 Side Window 338 MindShield 603 Side Window 338 MindShield 603 Side Window 338 MindShield 603 First Contact Region (Head) AIR BAG Second Contact Region (Head) Air BAG Steering Wheel 274 mm India inches Arm to Door 85 Steering Wheel 534 Pelvic Peak Lateral Acceleration (g's) Thorack Severity Index < | Cal | ibration Method | HYBRID III |
| Occupant Description NO COMMENTS Occupant Commentary HEAD & CHEST CONTACTED AIRBAG Head Head to - WindShielder Header 439 mm 17.3 inches Head Injury Criteria (HIC) 514 WindShield 603 mm 23.7 inches HIC Lower Time Interval (ms) 56.16 Seatback 0 mm 0.0 inches HIC Upper Time Interval (ms) 92.16 Side Header 251 mm 9.9 inches HIC Upper Time Interval (ms) 92.16 Side Window 338 mm 13.3 inches HIC Upper Time Interval (ms) 92.16 Side Window 338 mm 13.3 inches HIC Upper Time Interval (ms) 92.16 Neck to Seatback 0 mm 0.0 inches HIC Upper Time Interval (ms) 92.16 Chest 0 mm 0.0 inches HIC Upper Time Interval (ms) 92.16 Steering Wheel 274 mm 0.0 inches Steering Wheel 13.3 inches Steering Wheel 274 < | Occupa | nt Manufacturer | HUMANOID SYSTEMS S/N 142 |
| Decupant Commentary HEAD & CHEST CONTACTED AIRBAG Head Head to - Windshielder Header 439 mm 17.3 inches Head Injury Criteria (HIC) 514 WindShield 603 mm 23.7 inches HIC Lower Time Interval (ms) 56.16 Seatback 0 mm 0.0 inches HIC Upper Time Interval (ms) 92.16 Side Header 251 mm 9.9 inches HIC Upper Time Interval (ms) 92.16 Side Window 338 mm 13.3 inches Hick Dask 92.16 16 Neck to Seatback 0 mm 0.0 inches 10.0 10.0 10.0 Second Contact Region (Head) AIR BAG Second Contact Region (Head) 10.8 10.0 11.0 10.4 inches Steering Wheel 274 mm 10.8 inches Hip to Door 11.1 mm 4.4 inches Steering Wheel 534 Pelvic Peak Lateral Acceleration (g's) 51.3 Lap Belt Peak Load 5130 Newtons 1153.3 p | Occup | ant Modification | UNMODIFIED |
| Head Head to - WindShield F Header [439] mm [17.3] inches Head Injury Criteria (HIC) [514] WindShield [603] mm [23.7] inches HIC Lower Time Interval (ms) [56.16] Seatback 0 mm 0.0 inches Side Header [251] mm [9.9] inches HIC Upper Time Interval (ms) [92.16] Side Window 338 mm 10.3] inches Neck to Seatback 0 mm 0.0 inches First Contact Region (Head) IAIR BAG Second Contact Region (Head) Ecst Chest Chest Steering Wheel [274] mm 10.8 inches Staback 0 mm 0.0 inches Chest Severity Index [534] Pelvic Peak Lateral Acceleration (g's) Thorac C Trauma Index Thorax Peak Acceleration (g's) Thorac C Trauma Index Thorax Peak Acceleration (g's) Shoulder Belt Peak Load [5130] Newtons [152.3] pound Force First Contact Region (Chest/Abdomen) None Lap Belt Peak Load [8108] Newtons [182.3] pound Force First Contact Region (Chest/Abdomen) None Second Contact Region (Chest/Abdomen) None Second Contact Region (Chest/Abdomen) None | Occu | pant Description | NO COMMENTS |
| Head to - Windshielder Header 439 mm 17.3 inches Head Injury Criteria (HIC) 514 WindShield 603 mm 23.7 inches HIC Lower Time Interval (ms) 56.16 Seatback 0 mm 0.0 inches HIC Upper Time Interval (ms) 92.16 Side Header 251 mm 9.9 inches Side Window 338 mm 13.3 inches Neck to Seatback 0 mm 0.0 inches First Contact Region (Head) AIR BAG Second Contact Region (Head) Chest Chest to - Dash 493 mm 19.4 inches Arm to Door 85 mm 3.3 inches Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Seatback 0 mm 0.0 inches Chest Severity Index 534 Pelvic Peak Lateral Acceleration (g's) Thoracic Trauma Index Thorax Peak Acceleration (g's) 51.3 Lap Belt Peak Load 5130 Newtons 1153.3 pound Force Shoulder Belt Peak Load 8108 Newtons 1822.8 pound Force First Contact Region (Chest/Abdomen) AIR BAG Second Contact Region (Chest/Abdomen) NONE Legs Knees to Dash 161 mm 6.3 inches Knees to Seatback 0 mm 0.0 inches Left Femur Peak Load 4055 Newtons 1153.0 pounds Force Right Femur Peak Load 5052 Newtons 1138.0 pounds Force First Contact Region (Legs) DASHPANEL | Occupa | ant Commentary | HEAD & CHEST CONTACTED AIRBAG |
| Side Window 338 mm 13.3 inches Neck to Seatback 0 mm 0.0 inches First Contact Region (Head) AIR BAG | | WindShield 603 | 9 mm 17.3 inches Head Injury Criteria (HIC) 514 3 mm 23.7 inches HIC Lower Time Interval (ms) 56.16 |
| Neck to Seatback 0 mm 0.0 inches First Contact Region (Head) AIR BAG Second Contact Region (Head) Chest Chest to - Dash 493 mm 19.4 inches Arm to Door 85 mm 3.3 inches Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Seatback 0 mm 0.0 inches Chest Severity Index 534 Pelvic Peak Lateral Acceleration (g's) Thoracic Trauma Index Thorax Peak Acceleration (g's) 51.3 Lap Belt Peak Load 5130 Newtons 1153.3 pound Force Shoulder Belt Peak Load 8108 Newtons 1822.8 pound Force First Contact Region (Chest/Abdomen) AIR BAG Second Contact Region (Chest/Abdomen) NONE Knees to Dash 161 mm 6.3 inches Knees to Seatback 0 mm 0.0 inches Left Femur Peak Load 4055 Newtons 911.6 pounds Force Right Femur Peak Load 5062 Newtons 1138.0 pounds Force First Contact Region (Legs) DASHPANEL | | Side Header 251 | 1 mm 9.9 inches |
| First Contact Region (Head) AIR BAG Second Contact Region (Head) | Ş | Side Window 338 | 3 mm 13.3 inches |
| Second Contact Region (Head) Chest Chest Chest Chest Chest Chest Chest Chest Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Steering Wheel 274 mm 10.8 inches Thorax Feak Lateral Acceleration (g's) | Neck to Se | atback 0 r | mm 0.0 inches |
| Chest Chest to - Dash 493 mm 19.4 inches Arm to Door 85 mm 3.3 inches Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Seatback 0 mm 0.0 inches Hip to Door 111 mm 4.4 inches Chest Severity Index 534 Pelvic Peak Lateral Acceleration (g's) | | First Contact Re | legion (Head) |
| Chest to - Dash 493 mm 19.4 inches Steering Wheel 274 mm 10.8 inches Seatback 0 mm 0.0 inches Chest Severity Index 534 Pelvic Peak Lateral Acceleration (g's) Thoracic Trauma Index Thorax Peak Acceleration (g's) 51.3 Lap Belt Peak Load 5130 Newtons 1153.3 pound Force Shoulder Belt Peak Load 8108 Newtons 1822.8 pound Force First Contact Region (Chest/Abdomen) AIR BAG Second Contact Region (Chest/Abdomen) NONE Legs Knees to Dash 161 mm 6.3 inches Knees to Seatback0 mm 0.0 inches Left Femur Peak Load 4055 Newtons 911.6 pounds Force Right Femur Peak Load 5062 Newtons 1-1138.0 pounds Force First Contact Region (Legs) DASHPANEL | 5 | Second Contact Re | egion (Head) |
| Dash 493 mm 19.4 inches Arm to Door 85 mm 3.3 inches Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Seatback 0 mm 0.0 inches 111 mm 4.4 inches Chest Severity Index 534 Pelvic Peak Lateral Acceleration (g's) | | | <u>Chest</u> |
| Steering Wheel 274 mm 10.8 inches Hip to Door 111 mm 4.4 inches Seatback 0 mm 0.0 inches Pelvic Peak Lateral Acceleration (g's) | Chest to - | | |
| Seatback 0 mm 0.0 inches Chest Severity Index 534 Pelvic Peak Lateral Acceleration (g's) | | | |
| Chest Severity Index 534 Pelvic Peak Lateral Acceleration (g's) Thoracic Trauma Index Thorax Peak Acceleration (g's) 51.3 Lap Belt Peak Load 5130 Newtons 1153.3 pound Force Shoulder Belt Peak Load 8108 Newtons 1822.8 pound Force First Contact Region (Chest/Abdomen) AIR BAG Second Contact Region (Chest/Abdomen) NONE Legs Knees to Dash 161 mm 6.3 inches Knees to Seatback mm 0.0 inches Left Femur Peak Load 4055 Newtons 911.6 pounds Force Right Femur Peak Load 5062 Newtons 1138.0 pounds Force First Contact Region (Legs) DASHPANEL | 0 | | |
| Thoracic Trauma Index Thorax Peak Acceleration (g's) 51.3 Lap Belt Peak Load 5130 Newtons 1153.3 pound Force Shoulder Belt Peak Load 8108 Newtons 1822.8 pound Force First Contact Region (Chest/Abdomen) AIR BAG Second Contact Region (Chest/Abdomen) NONE Legs Knees to Dash 161 mm 6.3 inches Knees to Seatback mm 0.0 inches Left Femur Peak Load 4055 Newtons -911.6 pounds Force Right Femur Peak Load 5062 Newtons -1138.0 pounds Force First Contact Region (Legs) DASHPANEL | | | |
| Lap Belt Peak Load 5130 Newtons 1153.3 pound Force Shoulder Belt Peak Load 8108 Newtons 1822.8 pound Force First Contact Region (Chest/Abdomen) AIR BAG Second Contact Region (Chest/Abdomen) NONE Legs Knees to Dash 161 mm 6.3 inches Knees to Seatback 0 mm 0.0 inches Left Femur Peak Load 4055 Newtons -911.6 pounds Force Right Femur Peak Load 5062 Newtons -1138.0 pounds Force First Contact Region (Legs) DASHPANEL | | | |
| Shoulder Belt Peak Load 8108 Newtons 1822.8 pound Force First Contact Region (Chest/Abdomen) AIR BAG Second Contact Region (Chest/Abdomen) NONE Legs Knees to Dash 161 mm 6.3 inches Knees to Seatback mm 0.0 inches Left Femur Peak Load 4055 Newtons -911.6 pounds Force Right Femur Peak Load 5062 Newtons -1138.0 pounds Force First Contact Region (Legs) DASHPANEL | Thoracic I | | |
| First Contact Region (Chest/Abdomen) AIR BAG Second Contact Region (Chest/Abdomen) NONE Legs Knees to Dash 161 mm 6.3 inches Knees to Seatback mm 0.0 inches Left Femur Peak Load -4055 Newtons -911.6 pounds Force Right Femur Peak Load -5062 Newtons -1138.0 pounds Force First Contact Region (Legs) DASHPANEL | | • | |
| Second Contact Region (Chest/Abdomen) NONE Legs Knees to Dash 161 mm 6.3 inches Knees to Seatback mm 0.0 inches Left Femur Peak Load -4055 Newtons -911.6 pounds Force Right Femur Peak Load -5062 Newtons -1138.0 pounds Force First Contact Region (Legs) DASHPANEL | First C | | |
| Legs Knees to Dash 161 mm 6.3 inches Knees to Seatback mm 0.0 inches Left Femur Peak Load -4055 Newtons -911.6 pounds Force Right Femur Peak Load -5062 Newtons -1138.0 pounds Force First Contact Region (Legs) DASHPANEL | | - , | |
| Knees to Dash 161 mm 6.3 inches Knees to Seatback mm 0.0 inches Left Femur Peak Load -4055 Newtons -911.6 pounds Force Right Femur Peak Load -5062 Newtons -1138.0 pounds Force First Contact Region (Legs) DASHPANEL | Second C | Unlact Region (Che | est/Abdomen) |
| | Left Fem | ur Peak Load <mark>-4</mark> 0 ur Peak Load -5 0 | mm 6.3 inches Knees to Seatback 0 mm 0.0 inches 055 Newtons -911.6 pounds Force 062 Newtons -1138.0 pounds Force |
| | | | |

1994 DODGE CARAVAN LEFT FRONT SEAT OCCUPANT

| Test # | 1983 | | | | |
|-----------|------------------|--------------------|-------------|-----------------|--|
| Vehicle # | 1 | | Sex | MALE | |
| Location | LEFT FRONT SE | AT | Age | 0 | |
| Position | CENTER POSIT | ION | Height | 0 mm 0.0 inches | |
| Туре | HYBRID III DUM | MY | Weight | 0.0 kg 0 pounds | |
| Size | 50 PERCENTILE | | | | |
| Cali | ibration Method | HYBRID III | | | |
| Occupa | nt Manufacturer | HUMANOID SYSTEMS S | S/N 142 | | |
| Occupa | ant Modification | UNMODIFIED | | | |
| Occu | pant Description | NO COMMENTS | | | |
| Occupa | ant Commentary | HEAD & CHEST CONTA | CTED AIRBAG | | |
| | | | | | |
| | | Restraints | <u>5</u> | | |
| Restrai | nt # 1 3 POINT | BELT | | | |
| Mounte | ed 🗌 🗌 | | | | |
| Deploy | ment NOT APF | PLICABLE | | | |
| Restrai | nt Commentary | NO COMMENTS | | | |
| Restrai | nt # 2 FRONTA | L AIRBAG | | | |
| Mounte | ed | | | | |
| Deploy | ment DEPLOY | ED PROPERLY | | | |

Restraint Commentary NO COMMENTS

1994 DODGE CARAVAN RIGHT FRONT SEAT OCCUPANT

| Test # | 1983 | | |
|------------|----------------------|--------------------|--|
| Vehicle # | 1 | | Sex MALE |
| Location | RIGHT FRONT S | EAT | Age 0 |
| Position | CENTER POSITI | ON | Height 0 mm 0.0 inches |
| Туре | HYBRID III DUMI | ЛҮ | Weight 0.0 kg 0 pounds |
| Size | 50 PERCENTILE | | |
| Cal | ibration Method | HYBRID III | |
| Occupa | nt Manufacturer | ALDERSON RE | ESEARCH LABS S/N 192 |
| • | ant Modification | UNMODIFIED | |
| | pant Description | NO COMMENT | |
| Occupa | ant Commentary | HEAD AND CHE | IEST CONTACTED AIRBAG |
| Head to - | | | <u>Head</u> |
| Windshie | elder Header 400 | | |
| | WindShield 537 | | |
| | Seatback 0 | mm | inches HIC Upper Time Interval (ms) 84.88 |
| | Side Header 239 | \equiv \equiv | inches |
| | Side Window 319 | | |
| Neck to Se | | | nches |
| | First Contact R | · · = | NR BAG |
| | Second Contact Re | gion (Head) | |
| | | | |
| Chest to - | | <u> </u> | <u>Chest</u> |
| | Dash 523 n | nm 20.6 ind | nches Arm to Door 72 mm 2.8 inches |
| Steering | | | nches Hip to Door 138 mm 5.4 inches |
| - | | | nches hip to bool 130 him 3.4 inches |
| | Severity Index 44 | | Pelvic Peak Lateral Acceleration (g's) |
| | rauma Index | <u> </u> | Thorax Peak Acceleration (g's) 45.4 |
| | | Belt Peak Load | 3683 Newtons 828.0 pound Force |
| | | | 5048 Newtons 1134.8 pound Force |
| First C | ontact Region (Ch | | |
| | ontact Region (Ch | | |
| | 5 (| , <u> </u> | |
| Knees to | Dash 138 n | nm 5.4 ind | Legs hoches Knees to Seatback mm 0.0 inches |
| | | | nches Knees to Seatback[0] mm [0.0] inches wtons -1635.5] pounds Force |
| | | | wtons -1002.7 pounds Force |
| Nynt Felli | First Contact F | | ASHPANEL |
| | Second Contact R | | |
| | | | |

1994 DODGE CARAVAN RIGHT FRONT SEAT OCCUPANT

| Test # 1983 | | | |
|---------------------------------|-------------------|---------------|-------------------------------|
| Vehicle # 1 | | Sex | MALE |
| Location RIGHT FRONT SEA | Т | Age | 0 |
| Position CENTER POSITION | | Height | 0 mm 0.0 inches |
| Type HYBRID III DUMMY | | Weight | 0.0 kg 0 pounds |
| Size 50 PERCENTILE | |] | |
| Calibration Method | YBRID III | | |
| Occupant Manufacturer | LDERSON RESEARCH | LABS S/N 192 | |
| Occupant Modification | NMODIFIED | | |
| Occupant Description | O COMMENTS | | |
| Occupant Commentary | EAD AND CHEST CON | TACTED AIRBAG | |
| | | | |
| | Restraints | 5 | |
| Restraint # 1 3 POINT BEI | | | |
| Mounted | | | |
| Deployment NOT APPLIC | CABLE | | |
| Restraint Commentary | IO COMMENTS | | |
| Restraint # 2 FRONTAL A | IRBAG | | |
| Mounted | | | |
| Deployment DEPLOYED | PROPERLY | | |
| | O COMMENTS | | |

Vehicle 1 1994 DODGE CARAVAN

| Test # | 1983 | | | | | | | | | |
|-----------------|-----------------|----------------|-----------|-----------------|-----------------------|------------|------------|------------------|--------------------|-------------|
| VIN | 2B4GH2 | 5K2RR5269 | 983 | | NHTSA Te | est Vehic | le Numbe | er 1 | | |
| Year | 1994 | | | | Vehicle Mo | dification | Indicato | r PRODUC | TION VEHIC | LE |
| Make | DODGE | | Post-tes | t Steering | Column Shear | Capsule | Seperatio | on UNKNOW | /N | |
| Model | CARAVA | AN . | | Stee | ring Column C | ollapse M | lechanisn | n NOT APP | LICABLE | |
| Body | VAN | | | | | | | | | |
| Engine | 4 CYLIN | DER TRANS | SVERSE I | FRONT | | | | | | |
| Displacement | 2.5 | Liter T | ransmissi | on AUTC | MATIC - FROM | IT WHEE | L DRIVE | | | |
| Vehicle Modifie | cation(s) D | Description | NO CON | IMENTS | | | | | | |
| Vehicle Comm | nentary S | TEERING C | OLUMN | COVER CO | VERED COLL | APSE M | ECHANIS | M & SHEAR | CAPSULE | |
| Vehicle Ler | ngth 4 | 560 mm | 179.5 | inches | CG | i behind l | Front Axle | e 1201 mr | m 47.3 | inches |
| Vehicle \ | Width 1 | 810 mm | 71.3 | inches | Center of E | Damage t | o CG Axi | s 0 mr | m 0.0 | inches |
| Vehicle Whee | elbase 2 | 850 mm | 112.2 | inches | Total Len | gth of Inc | lentation | 1524 mr | m 60.0 | inches |
| Vehicle Test W | Veight 1 | 739 KG | 3833 | pounds | Maximum | Static Cru | sh Depth | n 600 mr | m 23.6 | inches |
| | | | | | | Pre-Impa | ict Speed | d 57 kp | oh 35.1 | mph |
| Ve | hicle Dam | age Index | 12FDEW | 4 | Princ | ipal Direc | tion of Fo | orce 0 | | |
| | | | | | | | | | | |
| Domogo Dr | ofilo Dio | tanaa Maa | ouromo | nto | Cruch from | n Dra 8 | Doot To | st Damage | Moouro | monto |
| Damage Pr | | | | | Clushillor | | | | | |
| | | to-Right, Re | | , | | Pre-Tes | | Post-Test | | Depth |
| DPD 1 | | nm <u>20.7</u> | inches | | Bumper Corner | | inches | | ches 20.7 | inches |
| DPD 2 | | nm <u>23.0</u> | inches | | | 4417 | mm | 3890 mr | m 527 | mm |
| DPD 3 | | nm <u>23.0</u> | inches | | Centerline | 179.5 | inches | 155.3 inc | ches 24.2 | inches |
| DPD 4 | | nm <u>23.0</u> | inches | | | 4560 | mm | 3945 mr | m 615 | mm |
| DPD 5 | | nm <u>23.6</u> | inches | Diaht F | Bumper Corner | 173.8 | inches | 154.3 inc | ches 19.5 | inches |
| DPD 6 | 495 n | nm 19.5 | inches | S ragin - | | 4415 | mm | 3920 mr | | |
| | | | | | | | | | | |
| Bumper E | Engageme | ent | | Sill I | Engagement | | | A-pill | lar Engagen | nent |
| • | npact Only | | | | e Impact Only) | | | - | de Impact O | |
| · | 0.0 |] | Г | | APPLICABLE | | | | 0.0 | |
| | | 1 | L | | | | | | | |
| Moving | g Test Car | t | | Moving | I Test Cart/Veh | icle | | Vehicle | • Orientation | on Cart |
| A | ngle | | | Cr | abbed Angle | | | Мо | oving Test Ca | art |
| NOT A | APPLICAE | BLE | | | 0.0 | | | NOT | | LE |
| Magnitude | of the Tilt An | gle | | Magniture | e of the Crabbed Ang | le | | Mag | gnitude of the Ang | yle |
| Measured b | etween surfac | ce of a | | Meas | sure Clockwise from | | | Measured betw | veen the Vehicle | Orientation |
| Rollover Test | Cart and the | Ground | Lo | ngitudinal Vect | or to Velocity Vector | of Vehicle | | and Direc | ction of Test Cart | t Motion |
| | | | | | | | | | | |

Vehicle 1 1994 DODGE CARAVAN

| Test # | 1983 | | | | | | | | | |
|-----------------|--|--------------------------------|---------------------|---------------------|------------------------|-------------|--|--|--|--|
| VIN | 2B4GH25K2RR526983 | 3 | NHTSA Test | Vehicle Numb | per 1 | | | | | |
| Year | 1994 Vehicle Modification Indicator PRODUCTION VEHICLE | | | | | | | | | |
| Make | DODGE Post-test Steering Column Shear Capsule Seperation UNKNOWN | | | | | | | | | |
| Model | | | | | | | | | | |
| Body | VAN |] | | | | | | | | |
| Engine | 4 CYLINDER TRANSVE | ERSE FRONT | | | | | | | | |
| Displacement | 2.5 Liter Tran | smission AUTOMA | TIC - FRONT V | WHEEL DRIVE | | | | | | |
| Vehicle Modifie | cation(s) Description | O COMMENTS | | | | | | | | |
| Vehicle Comm | entary STEERING COL | UMN COVER COVE | RED COLLAPS | <u>SE MECHANI</u> | SM & SHEAR CA | APSULE | | | | |
| Vehicle Ler | ngth <u>4560</u> mm <u>1</u> | 179.5 inches | CG be | hind Front Ax | de <u>1201</u> mm | 47.3 inches | | | | |
| Vehicle \ | Width 1810 mm 7 | 71.3 inches | Center of Dam | nage to CG A | xis <mark>0</mark> mm | 0.0 inches | | | | |
| Vehicle Whee | elbase 2850 mm 1 | I12.2 inches | Total Length | of Indentation | n <u>1524</u> mm | 60.0 inches | | | | |
| Vehicle Test W | /eight 1739 KG | 3833 pounds | Maximum Stat | | | 23.6 inches | | | | |
| | | | | e-Impact Spee | · | 35.1 mph | | | | |
| Ve | hicle Damage Index 12 | FDEW4 | Principal | Direction of F | orce 0 | | | | | |
| | _ | | | | | | | | | |
| | Pre | e & Post Test Da | amage Mea | asuremen | <u>ts</u> | | | | | |
| (Measureme | ents are taken in a longitudinaldire | ection. Except for Engine Bloc | k, all measurements | s are take from the | Rear Vehicle Surface f | orward.) | | | | |
| L | eft Side | C | enterline | | Righ | t Side | | | | |
| Pre-Test | Post-Test | Pre-Test | Post- | Test | Pre-Test | Post-Test | | | | |
| mm inche | es mm inches | mm inch | nes mm | inches | mm inches | mm inches | | | | |
| | | Length of | Vehicle at Cer | nterline | | | | | | |
| | | 4560 179 | .5 3945 | 155.3 | | | | | | |
| | | E | ngine Block | | | | | | | |
| | | 4800 189 | .0 480 | 18.9 | | | | | | |
| 4417 173.9 | 3890 153.1 | Fron | t Bumper Corn | ier 🛛 | 4415 173.8 | 3920 154.3 | | | | |
| | | Fr | ont of Engine | | | | | | | |
| | | 3910 153 | .9 3595 | 141.5 | | | | | | |
| 3604 141.9 | 3425 134.8 | | Firewall | | 3580 140.9 | 3400 133.9 | | | | |
| | | 3662 144 | .2 3265 | 128.5 | | | | | | |
| 3269 128.7 | 3274 128.9 | Upper Le | ading Edge of | Door | 3272 128.8 | 3277 129.0 | | | | |
| 3202 126.1 | 3198 125.9 | Lower Le | ading Edge of | Door | 3198 125.9 | 3202 126.1 | | | | |
| 3230 127.2 | 3225 127.0 | | om of 'A' Post | | 3232 127.2 | 3230 127.2 | | | | |
| 2184 86.0 | 2190 86.2 | | railing Edge of | = | 2182 85.9 | 2192 86.3 | | | | |
| 2186 86.1 | 2180 85.8 | Lower T | railing Edge of | Door | 2189 86.2 | 2186 86.1 | | | | |
| | | Ste | eering Column | | | | | | | |
| | | 2781 109 | | 109.3 | | | | | | |
| | | Center of Seering | | | al) | | | | | |
| | | 328 12.9 | | 11.9 | | | | | | |
| | | Center of Steering | | <u> </u> | al) | | | | | |
| | | 460 18.1 | 378 | 14.9 | | | | | | |

1994 DODGE CARAVAN

NHTSA Crash Test - #1983 - Front Impact

Pre/Post Depths - Vehicle Width - Closing Speed - Trapezoidal Average

| Test Vehicle Weight = | 3833 pounds |
|-------------------------|-------------|
| Vehicle Closing Speed = | 35.1 mph |
| Test Crush Length = | 71.3 inches |

Pre/Post Collision Crush Depths (inches)

| | Left Side Crush | Centerline Crush | Right Side Crush | (Dece Side) |
|---------------|-----------------|------------------|------------------|--------------|
| (Driver Side) | 20.7 | 24.2 | 19.5 | (Pass. Side) |

| | | CRASH | CRASH 3 Stiffness Coefficents | | | |
|----------------------------------|----------|----------|-------------------------------|--------|----------|--|
| | | <u>A</u> | В | G | <u> </u> | |
| Minimum Crush = 19.5 inches | | | | | 139.8 | |
| Using a Rated No Damage Speed of | 2.5 mph | 180.3 | 120.6 | 134.8 | | |
| Using a Rated No Damage Speed of | 5.0 mph | 332.9 | 102.8 | 539.0 | | |
| Using a Rated No Damage Speed of | 7.5 mph | 457.9 | 86.4 | 1212.8 | | |
| Using a Rated No Damage Speed of | 10.0 mph | 555.2 | 71.5 | 2156.0 | | |
| Average Crush = 22.2 inches | | | | | 107.8 | |
| Using a Rated No Damage Speed of | 2.5 mph | 158.3 | 93.0 | 134.8 | | |
| Using a Rated No Damage Speed of | 5.0 mph | 292.4 | 79.3 | 539.0 | | |
| Using a Rated No Damage Speed of | 7.5 mph | 402.2 | 66.7 | 1212.8 | | |
| Using a Rated No Damage Speed of | 10.0 mph | 487.7 | 55.2 | 2156.0 | | |
| Maximum Crush = 24.2 inches | | | | | 90.8 | |
| Using a Rated No Damage Speed of | 2.5 mph | 145.3 | 78.3 | 134.8 | | |
| Using a Rated No Damage Speed of | 5.0 mph | 268.2 | 66.7 | 539.0 | | |
| Using a Rated No Damage Speed of | 7.5 mph | 368.9 | 56.1 | 1212.8 | | |
| Using a Rated No Damage Speed of | 10.0 mph | 447.4 | 46.4 | 2156.0 | | |

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific

vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, Ib/in

B = Crush resistance per inch of damage width (Crash), lb/in^2

 $\mathsf{G}=\mathsf{Energy}$ dissipated without permanent damage, Ib

Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats Impact Speed (mph) = SQRT(30 * CF * max crush in feet)

| Crush | Maximum Crush | Calculated Impact Speed | Calculated Error | Calculated Error |
|--------|---------------|-------------------------|------------------|------------------|
| Factor | (inches) | (mph) | (mph) | (%) |
| 21 | 24.2 | 35.6 | 0.5 | 1.5 |

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.4

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

1994 DODGE CARAVAN

NHTSA Crash Test - #1983 - Front Impact

Pre/Post Depths - Indention Length - Closing Speed - Trapezoidal Average

| Test Vehicle Weight = | 3833 pounds |
|-------------------------|-------------|
| Vehicle Closing Speed = | 35.1 mph |
| Test Crush Length = | 60.0 inches |

Pre/Post Collision Crush Depths (inches)

| | Left Side Crush | Centerline Crush | Right Side Crush | (Dece Side) |
|---------------|-----------------|------------------|------------------|--------------|
| (Driver Side) | 20.7 | 24.2 | 19.5 | (Pass. Side) |

| | | CRASH | 3 Stiffness Coe | efficents | SMAC Stiffness |
|----------------------------------|----------|----------|-----------------|-----------|----------------|
| | | <u>A</u> | В | G | <u> </u> |
| Minimum Crush = 19.5 inches | | | | | 166.0 |
| Using a Rated No Damage Speed of | 2.5 mph | 214.1 | 143.2 | 160.0 | |
| Using a Rated No Damage Speed of | 5.0 mph | 395.4 | 122.1 | 640.2 | |
| Using a Rated No Damage Speed of | 7.5 mph | 543.8 | 102.7 | 1440.4 | |
| Using a Rated No Damage Speed of | 10.0 mph | 659.4 | 84.9 | 2560.7 | |
| Average Crush = 22.2 inches | | | | | 128.1 |
| Using a Rated No Damage Speed of | 2.5 mph | 188.1 | 110.5 | 160.0 | |
| Using a Rated No Damage Speed of | 5.0 mph | 347.3 | 94.2 | 640.2 | |
| Using a Rated No Damage Speed of | 7.5 mph | 477.7 | 79.2 | 1440.4 | |
| Using a Rated No Damage Speed of | 10.0 mph | 579.2 | 65.5 | 2560.7 | |
| Maximum Crush = 24.2 inches | | | | | 107.8 |
| Using a Rated No Damage Speed of | 2.5 mph | 172.5 | 93.0 | 160.0 | |
| Using a Rated No Damage Speed of | 5.0 mph | 318.6 | 79.3 | 640.2 | |
| Using a Rated No Damage Speed of | 7.5 mph | 438.2 | 66.7 | 1440.4 | |
| Using a Rated No Damage Speed of | 10.0 mph | 531.3 | 55.1 | 2560.7 | |

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation

vehicles may, however, have a higher rating

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific

A = Maximum force per inch of damage without permanent damage, Ib/in

 $B = Crush resistance per inch of damage width (Crash), Ib/in^2$

G = Energy dissipated without permanent damage, lb

Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats Impact Speed (mph) = SQRT(30 * CF * max crush in feet)

| Crush | Maximum Crush | Calculated Impact Speed | Calculated Error | Calculated Error |
|--------|---------------|-------------------------|------------------|------------------|
| Factor | (inches) | (mph) | (mph) | (%) |
| 21 | 24.2 | 35.6 | 0.5 | 1.5 |

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.4

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

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Registered Owner: 4N6XPRT SYSTEMS

Available Test Results Front Impact Test Summary

Report Filter Settings

Year Range: 1991 - 1995 Make: PLYMOUTH Model: VOYAGER

| Test Numbe | Vehicle er Info | No Damage | Average | Closing | V | ehicle | Widtł | ۱ | |
|---------------|-------------------------------|----------------|-----------------|----------------|----------|--------------|-----------|--------------|-----------------|
| | | Speed (mph) | Crush (inch) | Speed (mph) | S t A | iffness B | valu G | l e s Kv | Crush Factor |
| | | (inpii) | (IIICII) | (inpii) | ~ | D | 0 | | i actor |
| 2351 | 1992 PLYMOUTH VOYAGER VAN VAN | 5.0 | 6.8 | 9.8 | 171.3 | 24.3 | 604.1 | 100.9 | 5.7 |
| 2350 | 1992 PLYMOUTH VOYAGER VAN VAN | 5.0 | 4.6 | 9.8 | 250.6 | 52.0 | 604.1 | 215.8 | 8.3 |
| 1669 | 1992 DODGE CARAVAN VAN | 5.0 | 24.0 | 35.0 | 281.7 | 70.2 | 564.7 | 95.6 | 20.4 |
| 1983 | 1994 DODGE CARAVAN VAN | 5.0 | 22.5 | 35.1 | 288.0 | 77.0 | 539.0 | 104.7 | 21.9 |
| 2353 | 1992 PLYMOUTH VOYAGER VAN VAN | 5.0 | 24.7 | 35.0 | 292.9 | 71.0 | 604.1 | 96.7 | 19.8 |
| 1662 | 1992 PLYMOUTH VOYAGER VAN VAN | 5.0 | 18.4 | 29.6 | 304.4 | 81.3 | 570.2 | 117.7 | 19.0 |
| 2352 | 1992 PLYMOUTH VOYAGER VAN VAN | 5.0 | 11.6 | 19.9 | 308.7 | 78.9 | 604.1 | 140.8 | 13.6 |
| 2091 | 1994 DODGE CARAVAN VAN | 5.0 | 17.1 | 29.1 | 334.3 | 94.2 | 593.1 | 137.4 | 19.8 |
| | | Average | (AVG) | | 279.0 | 68.6 | 585.4 | 126.2 | 16.1 |
| | | Minimum | (MIN) | | 171.3 | 24.3 | 539.0 | 95.6 | 5.7 |
| | | Maximum | (MAX) | | 334.3 | 94.2 | 604.1 | 215.8 | 21.9 |
| | Standard Deviatio | n (STDev-sa | ample) | | 49.7 | 21.5 | 24.7 | 40.3 | 6.1 |
| | Nu | mber of Te | sts (n) | 8 | | | | | |

Available Test Results Front Impact Test Summary

Report Filter Settings

Year Range: 1991 - 1995 Make: PLYMOUTH Model: VOYAGER

| Test Number | Vehicle Info | No Damage Speed (mph) | Max Crush (inch) | - | - | ehicle iffness B | | | Crush Factor |
|----------------|-------------------------------|--------------------------------|------------------------|------|-------|------------------------|-------|-------|-----------------|
| 2351 | 1992 PLYMOUTH VOYAGER VAN VAN | 5.0 | 11.1 | 9.8 | 104.9 | 9.1 | 604.1 | 37.8 | 3.5 |
| 2350 | 1992 PLYMOUTH VOYAGER VAN VAN | 5.0 | 8.1 | 9.8 | 142.9 | 16.9 | 604.1 | 70.1 | 4.7 |
| 2352 | 1992 PLYMOUTH VOYAGER VAN VAN | 5.0 | 20.4 | 19.9 | 176.0 | 25.6 | 604.1 | 45.8 | 7.7 |
| 2874 | 1994 DODGE CARAVAN VAN | 5.0 | 18.6 | 25.3 | 259.3 | 56.7 | 592.9 | 88.1 | 13.8 |
| 2353 | 1992 PLYMOUTH VOYAGER VAN VAN | 5.0 | 27.6 | 35.0 | 262.5 | 57.0 | 604.1 | 77.7 | 17.7 |
| 1669 | 1992 DODGE CARAVAN VAN | 5.0 | 25.3 | 35.0 | 267.5 | 63.4 | 564.7 | 86.3 | 19.3 |
| 1983 | 1994 DODGE CARAVAN VAN | 5.0 | 24.2 | 35.1 | 268.1 | 66.7 | 539.0 | 90.7 | 20.4 |
| 1662 | 1992 PLYMOUTH VOYAGER VAN VAN | 5.0 | 20.5 | 29.6 | 273.3 | 65.5 | 570.2 | 94.9 | 17.1 |
| 2091 | 1994 DODGE CARAVAN VAN | 5.0 | 19.9 | 29.1 | 286.8 | 69.3 | 593.1 | 101.1 | 17.0 |
| | | Average (| AVG) | | 226.8 | 47.8 | 586.3 | 76.9 | 13.5 |
| | | Minimum | (MIN) | | 104.9 | 9.1 | 539.0 | 37.8 | 3.5 |
| Maximum (MAX) | | | (MAX) | | 286.8 | 69.3 | 604.1 | 101.1 | 20.4 |
| | Standard Deviatio | n (STDev-sa | mple) | | 67.0 | 23.7 | 23.2 | 22.0 | 6.5 |
| | Nu | mber of Tes | sts (n) | 9 | | | | | |

4N6XPRT Systems

Expert System Software for Litigation

8387 University Avenue La Mesa, CA 91942 Phone: (619) 464-3478 Fax: (619) 464-2206 Toll Free: 1- 800-266-9778

Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the front of the Honda Accord was used, with the Stiffness Values from the range of tests for the Plymouth Voyager as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on AVERAGE crush

| Curb Weight (pour | | | PDOF | ever Arm Distan | ce (inches) | : | 0.00 |
|---|----------------------------------|------------------------|-------------------|---------------------------|----------------|------------------|-----------------------|
| Occupant + Cargo Weight (pour Total Weight (pour | | 0 | Yaw M | loment of Inerti | a (lb-ft-sec | ²) | 1747.00 |
| Angle Coll Force to Normal (degre | ees): 0 | .0 | "Known" S | tifness Values | | | |
| No Damage Speed (m | ph): 5 | .0 | | Average | A 279.0 | | B 68.6 |
| Energy Crush Depth (incl | nes): 3.7 | /3 | | Minimum | 171.3 | | 24.3 |
| Damage Length (incl | hes): 61 | .0 | | Maximum | 334.3 | | 94.2 |
| | | | C+ | d. Devation | 49.7 | | 21.5 |
| Crush Profile Measureme | | 4 | | | | | |
| | Unequal Spacing | Zone Area | Zone Depth(x) | Area Depth(x) | Zone Depth(| | Area Depth(y) |
| | (inches) | (inches ²) | (inches) | (inches ²) | (inche | | inches ²) |
| C1 (inches) 4.00 | 30.00 | 105.00 | 1.76 | 185.00 |] 14 | 4.29 | 1500.00 |
| C2 (inches) 3.00 | 17.00 | 59.50 | 1.76 | 104.83 | 25 | 5.90 | 1541.33 |
| C3 (inches) 4.00 | 14.00 | 63.00 | 2.26 | 142.33 | 35 | 5.26 | 2221.33 |
| C4 (inches) 5.00 | | | | | | | |
| C5 (inches) | | | | | | | |
| C6 (inches) | | | | | | | |
| C7 (inches) | | |] | 7 | | | |
| C8 (inches) | | |] | | , , | | |
| C9 (inches) | | |] |] | | | |
| C10 (inches) | | L | J [| | | | |
| Average Crush (inches): | 3.73 | | | | | | |
| Results | | | Average | _ | KE | | Closing |
| | А | В | Force (pounds) | Damage Energy (ft*lbs) | Speed (mph) | Delta V (mph) | Speed (MPH) |
| Minimum | 171.3 | 24.3 | 7988.78 | 7191.91 | 8.5 | 7.8 | 16.6 |
| Avg - 2 Std. Deviations | 179.6 | 25.6 | 8389.80 | 7529.39 | 8.7 | 8.0 | 16.9 |
| Avg - 1 Std. Deviations | 229.3 | 47.1 | 12351.28 | 8880.70 | 9.4 | 8.8 | 18.6 |
| Average | 279.0 | 68.6 | 16312.75 | 10643.98 | 10.3 | 9.6 | 20.4 |
| Avg + 1 Std. Deviations | 328.7 | 90.1 | 20274.23 | 12524.30 | 11.2 | 10.4 | 22.1 |
| Avg + 2 Std. Deviations | 378.4 | 111.6 | 24235.70 | 14454.03 | 12.0 | 11.1 | 23.6 |
| Maximum | 334.3 | 94.2 | 20911.40 | 12745.65 | 11.3 | 10.5 | 22.3 |
| Damage Centroid Depth (x) (| inches) | 1.90 | | | k² [| 2700.1 | 6 |
| Damage Centroid Depth (y) (| inches) | 23.13 | E | Eff. Mass Ratio (g | jamma) [| 1.0 | 0 |
| Area of Damage (in | ches ²) [.] | 227.50 | | | | | |

1994 PLYMOUTH VOYAGER 2WD - Front Impact

4N6XPRT StifCalcs® licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

| | | • | | | |
|-------------------------------------|---------------------------------------|-----------------------|------------------------|-----------------------------|------------------------|
| Curb Weight (pounds | | PDOF | Lever Arm Distan | ce (inches): | 0.00 |
| Occupant + Cargo Weight (pound | · · · · · · · · · · · · · · · · · · · | Yaw N | Moment of Inerti | a (lb-ft-sec ²) | 1542.04 |
| Total Weight (pounds | S): 2008 | | | · · · · | |
| Angle Coll Force to Normal (degrees | s): 0.0 | | | | |
| No Damage Speed (mpł | h): 5.0 | | | | |
| Energy Crush Depth (inche | s): 3.28 | | | | |
| Damage Length (inche | es): 61.0 | | | | |
| | | | | | |
| Crush Profile Measurement | | 7 | A | 7 | A |
| | Unequal Spacing Zone A | Zone vrea Depth(x) | Area Depth(x) | Zone Depth(y) | Area Depth(y) |
| | (inches) (inche | • | (inches ²) | (inches) | (inches ²) |
| C1 (inches) 5.00 | | 3.00 2.0 | | 7.7 | |
| C2 (inches) 3.00 | | 2.00 1.5 | | 21.0 | |
| C3 (inches) 3.00 | | 0.00 1.5 | | 75.0 | |
| C4 (inches) 3.00 | | | |] [73.0 | |
| C5 (inches) | | | |] [| |
| C6 (inches) | | | | | |
| C7 (inches) | | | | | |
| C8 (inches) | | | | | |
| C9 (inches) | | | | | |
| C10 (inches) | | | | | |
| Average Crush (inches): | 3.28 | | | | |
| | 5.20 | Average | | KE | |
| Results | | Average Force | Damage | | elta V |
| | A B | (pounds) | Energy (ft*lbs) | • | mph) bsub1 |
| Minimum | 162.8 30.2 | 7988.78 | 5792.09 | 8.1 | 8.8 16.3 |
| Avg - 2 Std. Deviations | 168.7 32.4 | 8389.80 | 5952.22 | 8.2 | 8.9 16.9 |
| Avg - 1 Std. Deviations | 221.5 55.9 | 12351.28 | 7492.11 | 9.2 | 9.9 22.2 |
| Average | 267.5 81.5 | 16312.75 | 8976.09 | 10.0 | 10.8 26.8 |
| Avg + 1 Std. Deviations | 308.6 108.6 | 20274.23 | 10421.59 | 10.8 | 11.7 31.0 |
| Avg + 2 Std. Deviations | 346.3 136.7 | 24235.70 | 11838.55 | 11.5 | 12.5 34.7 |
| Maximum | 314.9 113.0 | 20911.40 | 10651.23 | 10.9 | 11.8 31.6 |
| Damage Centroid Depth (x) (ind | ches) 1.68 | | | k² | 2679.96 |
| Damage Centroid Depth (y) (ind | ches) 40.81 | | Eff. Mass Ratio (g | gamma) | 1.00 |
| Area of Damage (inch | nes ²): 200.00 | | | | |

1986 HONDA ACCORD LXI - Front Impact

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Expert System Software for Litigation

8387 University Avenue La Mesa, CA 91942 Phone: (619) 464-3478 Fax: (619) 464-2206 Toll Free: 1- 800-266-9778

Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the front of the Honda Accord was used, with the Stiffness Values from the range of tests for the Plymouth Voyager as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on MAXIMUM crush

| Curb Weight (pound | - | | PDOF | _ever Arm Distar | nce (inches | 5): | 0.00 |
|---|---------------------|-------------------------------------|----------------------|-----------------------|----------------|------------------|-----------------------|
| Occupant + Cargo Weight (pound Total Weight (pound | | 0 | Yaw N | Noment of Inert | ia (lb-ft-seo | c ²) | 1747.00 |
| Angle Coll Force to Normal (degrees | s): 0 . | .0 | "Known" S | Stifness Values | | | |
| No Damage Speed (mpl | n): 5 . | .0 | | | A 226.8 | 5 | B 47.8 |
| Energy Crush Depth (inche | | /3 | | Average | 104.9 | | |
| Damage Length (inche | | | | Minimum | | | 9.1 |
| | | | | Maximum | 286.8 | | 69.3 |
| Crush Profile Measurement | s: | 4 | SI | td. Devation | 67.0 | | 23.7 |
| | Jnequal | 7 | Zone | Area | Zon | | Area |
| | Spacing (inches) | Zone Area (inches ²) | Depth(x) (inches) | Depth(x) (inches²) | Depth (inch | • | Depth(y) (inches²) |
| C1 (inches) 4.00 | 30.00 | 105.00 | | | | .4.29 | 1500.00 |
| C2 (inches) 3.00 | 17.00 | 59.50 | | | | 25.90 | 1541.33 |
| C3 (inches) 4.00 | 14.00 | 63.00 | | | | 5.26 | 2221.33 |
| C4 (inches) 5.00 | | |] [| |] [| | |
| C5 (inches) | | | | | J L 7 [| | |
| C6 (inches) | | |] [| | J [7 [| | |
| C7 (inches) | | | | | | | |
| C8 (inches) | | | | | | | |
| C9 (inches) | | | | | | | |
| C10 (inches) | | | | | | | |
| Average Crush (inches): | 3.73 | | | | | | |
| | | | Average | | KE | | Closing |
| Results | | | Force | Damage | Speed | Delta V | Speed |
| | Α | B | (pounds) | Energy (ft*lbs) | (mph) | (mph) | (MPH) |
| Minimum | 104.9 | 9.1 | 4234.58 | 5389.92 | 7.3 | 6.7 | 14.3 |
| Avg - 2 Std. Deviations | 92.8 | 0.4 | 2875.90 | 56494.81 | 23.8 | 16.8 | 35.7 |
| Avg - 1 Std. Deviations | 159.8 | 24.1 | 7615.28 | 6590.59 | 8.1 | 7.6 | 16.1 |
| Average | 226.8 | 47.8 | 12354.65 | 8756.34 | 9.4 | 8.7 | 18.6 |
| Avg + 1 Std. Deviations | 293.8 | 71.5 | 17094.03 | 11213.38 | 10.6 | 9.8 | 20.8 |
| Avg + 2 Std. Deviations | 360.8 | 95.2 | 21833.40 | 13744.17 | 11.7 | 10.8 | 22.9 |
| Maximum | 286.8 | 69.3 | 16630.28 | 10949.79 | 10.5 | 9.7 | 20.6 |
| Damage Centroid Depth (x) (in | ches) | 1.90 | | | k² | 2700.1 | .6 |
| Damage Centroid Depth (y) (in | ches) | 23.13 | | Eff. Mass Ratio (| gamma) | 1.0 | 0 |
| Area of Damage (inch | nes ²): | 227.50 | | | | | |

1994 PLYMOUTH VOYAGER 2WD - Front Impact

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| | | | • | | | | |
|----------------------------------|--------------------|----------------------|----------|------------------------|---------------|------------------|-----------------------|
| Curb Weight (pou | | | PDOF | Lever Arm Distar | ice (inches | 5): | 0.00 |
| Occupant + Cargo Weight (pou | · · · | 0 | Yaw N | Moment of Inerti | ia (lb-ft-seo | c ²) | 1542.04 |
| Total Weight (pou | nus). 20 | 00 | | | | | |
| Angle Coll Force to Normal (degr | ees): C | 0.0 | | | | | |
| No Damage Speed (n | nph): 5 | 5.0 | | | | | |
| Energy Crush Depth (inc | :hes): 3. : | 28 | | | | | |
| Damage Length (ind | ches): 61 | 1.0 | | | | | |
| Cruch Dusfile Messurers | | 4 | | | | | |
| Crush Profile Measurem | Unequal | 4 | Zone | Area | Zon | ۵ | Area |
| | Spacing | Zone Are | | Depth(x) | Depth | | Pepth(y) |
| | (inches) | (inches ² | | (inches ²) | (inch | • | inches ²) |
| C1 (inches) 5.00 | 17.00 | 68.0 | 0 2.04 | 4 138.83 | | 7.79 | 529.83 |
| C2 (inches) 3.00 | 14.00 | 42.0 | 0 1.5 | 0 63.00 | 2 | 1.00 | 882.00 |
| C3 (inches) 3.00 | 30.00 | 90.0 | 0 1.5 | 0 135.00 | 7 | /5.00 | 6750.00 |
| C4 (inches) 3.00 | | | | |] [| | |
| C5 (inches) | | | | | , , | | |
| C6 (inches) | |) [] | | | 」 ヿ | | |
| C7 (inches) | | | | | 」()(| | |
| C8 (inches) | | 」 」 | | | J [J [| | |
| C9 (inches) | | | | | J [| | |
| C10 (inches) | | | | | | | |
| Average Crush (inches): | 3.28 | | | | | | |
| Deculto | | | Average | | KE | | |
| Results | | _ | Force | Damage | Speed | Delta V | |
| _ | A | B | (pounds) | Energy (ft*lbs) | (mph) | (mph) | bsub1 |
| Minimum _ | 100.8 | 11.6 | 4234.58 | 4236.04 | 6.9 | 7.6 | 10.1 |
| Avg - 2 Std. Deviations | 73.9 | 6.2 | 2875.90 | 3636.30 | 6.4 | 18.9 | 7.4 |
| Avg - 1 Std. Deviations | 157.2 | 28.2 | 7615.28 | 5642.08 | 8.0 | 8.5 | 15.8 |
| Average | 221.6 | 55.9 | 12354.65 | 7493.40 | 9.2 | 9.8 | 22.2 |
| Avg + 1 Std. Deviations | 275.9 | 86.8 | 17094.03 | 9263.83 | 10.2 | 11.0 | 27.7 |
| Avg + 2 Std. Deviations | 323.8 | 119.5 | 21833.40 | 10982.29 | 11.1 | 12.1 | 32.5 |
| Maximum | 270.9 | 83.6 | 16630.28 | 9093.20 | 10.1 | 10.9 | 27.2 |
| Damage Centroid Depth (x) | (inches) | 1.68 | | | k² | 2679.96 | 5 |
| Damage Centroid Depth (y) | (inches) | 40.81 | | Eff. Mass Ratio (| gamma) | 1.00 | ז |
| Area of Damage (ir | nches²): | 200.00 | | | | | |

1986 HONDA ACCORD LXI - Front Impact

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Expert VIN DeCoder®

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Version Number 3.1.0.3

| | DeCoded VIN: 1HGBA7446GA128552 |
|---------------------|---|
| Model: | 1986 Honda Accord LXi 4 Door Sedan |
| Engine Size: | 1.8 L/ 107 cu.in. |
| Engine Description: | In-Line 4 cylinder with Overhead Cam |
| Horse Power: | 98 @ 5500 rpm |
| Torque: | 109 lb-ft at 3500 rpm |
| Injection System: | 2 Bbl Carburetor |
| PSI: | 3 psi Ignition: electronic |
| Manufacturer: | Honda |
| Assembly Plant: | Marysville, Ohio |
| Drive Wheels: | This is a Front Wheel Drive vehicle w/ Manual Seatbelts |

- The First through Third characters (1HG) indicate a Honda Passenger Car made in the U.S.A.
- The Fourth through Sixth characters (BA7) indicate an Accord and the OEM engine: 1.8 L/ 107 cu.in., L4, OHC
- The Seventh character (4) indicates a 4 Door Sedan
- The Eighth character (4) indicates a LXi series and Manual Seatbelts
- The Ninth character (the check digit) is entered as 6. The VIN appears Valid, the calculated value is 6.

The Tenth character (G) indicates the model year 1986

- The Eleventh character (A) indicates the vehicle was made in the assembly plant in Marysville, Ohio
- The Twelfth through Seventeenth characters (128552) indicate the Serial Number and are unique to this vehicle.

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PROVIDED BY: 4N6XPRT Systems 8387 University Avenue La Mesa CA 91942

7/19/2012

| 1986 HONDA ACCORD LXI 4 DOOR SEDAN | | | |
|--|--|--|--|
| Curb Weight: Curb Weight Distribution - Front: | 2668 lbs. | Rear: | <u>1210</u> kg. 37 % |
| Gross Vehicle Weight Rating: | <u>3470</u> 1bs. | | 1574 kg. |
| Number of Tires on Vehicle: Drive Wheels: | 4 FRONT | | |
| Horizontal Dimensions Total Length Wheelbase: | Inches 180 102 | Feet 15.00 8.50 | Meters 4.57 2.59 |
| Front Bumper to Front Axle: Front Bumper to Front of Front Well: Front Bumper to Front of Hood: Front Bumper to Base of Windshield: Front Bumper to Top of Windshield: | 36 17 4 47 76 | 3.00 1.42 0.33 3.92 6.33 | 0.91 0.43 0.10 1.19 1.93 |
| Rear Bumper to Rear Axle: Rear Bumper to Rear of Rear Well: Rear Bumper to Rear of Trunk: Rear Bumper to Base of Rear Window: | 42 29 4 21 | 3.50 2.42 0.33 1.75 | 1.07 0.74 0.10 0.53 |
| Width Dimensions Maximum Width: Front Track: Rear Track: | 67 58 58 | 5.58 4.83 4.83 | 1.70 1.47 1.47 |
| Vertical Dimensions Height: Ground to - | 53 | 4.42 | 1.35 |
| Front Bumper (Top) Headlight - center Hood - top front: Base of Windshield Rear Bumper - top: Trunk - top rear: Base of Rear Window: | 17 24 26 34 23 37 38 | 1.42 2.00 2.17 2.83 1.92 3.08 3.17 | 0.43 0.61 0.66 0.86 0.58 0.94 0.97 |

| 1986 HONDA ACCORD LXI 4 DOOR SEDAN | | | |
|---|----------------------------------|----------------------|-------------------------|
| Interior Dimensions Front Seat Shoulder Width Front Seat to Headliner Front Leg Room - seatback to floor (max) | Inches 39 43 | Feet 3.25 3.58 | Meters 0.99 1.09 |
| Rear Seat Shoulder Width Rear Seat to Headliner Front Leg Room - seatback to floor (min) | 37 32 | 3.08 2.67 | 0.94 0.81 |
| Seatbelts: <u>3pt - front and rear</u> Airbags: <u>NO AIRBAGS</u> | | | |
| Steering Data Turning Circle (Diameter) Steering Ratio: 17.30:1 Wheel Radius: Tire Size (OEM): 195-60R14 | <u>492</u> 11 | 41.00 | 0.28 |
| Acceleration & Braking Information Brake Type: FRONT DISC - REAR DRUM ABS System: ABS UNKNOWN | | | |
| Braking, 60 mph to 0 (Hard pedal, no skid, d d = 134.0 ft t = 3.1 sec a | a = -28.8 ft/s | ec² G-fo | rce = -0.90 |
| 0 to 60mph $t = 9.8$ sec a 45 to 65mph $t = sec$ a | a = ft/s a = ft/s a = ft/s | ec² G-fo | rce = rce = rce = |
| Transmission Type: <u>5spd MANUAL</u> | | | |
| Notes: Federal Bumper Standard Requirements: This vehicles Rated Bumper Strength: | 2.5 mp 5 mp | | |

N.S.D.C = 1986 - 1989

| 1986 | HONDA | ACCORD | LXI | 4 | DOOR | SEDAN | |
|------|-------|--------|-----|---|------|-------|--|
|------|-------|--------|-----|---|------|-------|--|

| Other Information Tip-Over Stability Ratio = NHTSA Star Rating (calculated) | 1.39 | Stable **** |
|---|------|--------------------------------|
| Center of Gravity (No Load): | | |
| Inches behind front axle | = | 37.74 |
| Inches in front of rear axle | = | 64.26 |
| Inches from side of vehicle | = | 33.50 |
| Inches from ground | = | 20.80 |
| Inches from front corner | = | 80.99 |
| Inches from rear corner | = | 111.42 |
| Inches from front bumper | = | 73.74 |
| Inches from rear bumper | = | 106.26 |
| Moments of Inertia Approximations (No Load): | | |
| Yaw Moment of Inertia | = | 1542.04 lb*ft*sec ² |
| Pitch Moment of Inertia | = | 1492.32 lb*ft*sec ² |
| Roll Moment of Inertia | = | 330.24 lb*ft*sec ² |
| Front Profile Information | | |
| Angle Front Bumper to Hood Front | = | 66.0 deg |
| Angle Front of Hood to Windshield Base | = | 10.5 deg |
| Angle Front of Hood to Windshield Top | = | 19.1 deg |
| Angle of Windshield | = | 30.4 deg |
| Angle of Steering Tires at Max Turn | = | 23.8 deg |
| | | |

First Approximation Crush Factors:

Speed Equivalent (mph) of Kinetic Energy (KE) used in causing crush of indentation may be evaluated using the following formula, the appropriated Crush Factor (CF), and Maximum Indentation Depth (MID), in feet:

V(mph) = V(30 * CF * MID)

KE Equivalent Speed (Front/Rear/Side) = 21 CF
Bullet vehicle IMPACT SPEED estimation
based on TARGET VEHICLE damage ONLY = 27 CF
(Tested for Rear/Side Impact only)

These CF values are based upon analysis of NHTSA Barrier Crash data, and from over 1000 vehicle accidents where independant evaluation of speed was possible. (These are NOT 'A', 'B', 'C', or 'G' values)

The rear Impact data with more then 2-3 inches of crush damage should be looked at carefully, since some vehicles have very weak trunk & fender strength. Therefore, on some cars, especially GM, you estimate from the rear crush data may be high by as much as 4-5 mph (on a crush of 18 inches).

Stiffness Values and Test Data

NHTSA Crash Test #1054

1987 HONDA ACCORD

Provided By

4N6XPRT StifCalcs®

Registered to:

4N6XPRT SYSTEMS 8387 UNIVERSITY AVENUE LA MESA CA 91941-3842 11R-030201SC01301

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Sister/Clone database reader

You entered: 1986 HONDA ACCORD

The Sister/Clone Vehicle Year/Model Interchange list indicates the following are Similar Models

| Year Range | Year Range Make | | Body Styles | Wheelbase |
|-----------------|-------------------|--------|----------------|--------------|
| 1986 - 1989 | HONDA | ACCORD | 2D, 3D, 4D, SW | 110.2, 107.9 |
| Remarks: NEW CC | UPE MID-YEAR in 8 | 38 | | |

The data contained in the database has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. 4N6XPRT Systems® has made no changes to this data, and has only provided for distribution of this data free of charge. 4N6XPRT Systems® makes no warranties, either expressed or implied, with respect to this data, its quality, performance, merchantability, or fitness for any particular purpose. The entire risk as to its quality and performance is with the user. In no event will 4N6XPRT Systems® be liable for direct, indirect, incidental, or consequential damages resulting from any data presented here, even if 4N6XPRT Systems® has been advised of the possibility of such damages. The user must agree to assume full responsibility for any decisions which are based, in whole or in part, upon information obtained by using this data. As previously stated, the data has been provided free of charge as a courtesy to the traffic accident reconstruction community by Gregory C. Anderson of Scalia Safety Engineering. Mr. Anderson does not in any way guarantee the accuracy of the data. Some of the listed similarities are based on his own estimates or memory. Most of the data are pulled from specification tables which may contain inaccuracies of their own. Use common sense - if something seems wrong, check it (and if it is wrong, let him know!).

If you have suggestions, corrections, etc., you should contact Greg Anderson at Scalia Safety Engineering, 521 East Washington Avenue, Suite 200, Madison, WI 53703-2914, (608) 256-0820, FAX (608) 256-0212, E-mail: greganderson@cs.com.

Test Information

| | _ | | | | | | | |
|----------------------|------------------|----------------------|-------------|-----------------|---------------|---------|---------------|--------|
| Test # 1054 | | NHTSA Test F | Reference (| Guide Version # | 2 | | | |
| Test Date 1987-07-24 | 4 | | | Contract # | DTNH22-87- | C-01024 | | |
| Contract/Study Title | 1987 HOND | A ACCORD INTO |) FRONTA | L BARRIER | | | | |
| Test Objective(s) | 30 MPH FRC | DNTAL BARRIER | IMPACT 2 | 08,212,219(PAF | RTIAL) & 301- | 75 COMF | LIANCE | |
| Test Type | FMVSS 208 | OCCUPANT CRA | SH PROTI | ECTION | Configuration | VEHICL | E INTO BARRIE | R |
| Impact Angle | 0 | | Si | de Impact Point | 0 | mm | 0.0 | inches |
| | | | | | 0 | mm | 0.0 | inches |
| | | | | Closing Speed | 47.5 | Km/Hr | 29.52 | MPH |
| Test Performer | TRC OF OHI | 0 | | | | | | |
| Test Reference # | 870724 | | | | | | | |
| Test Track Surface | CONCRETE | | | Condition | DRY | | | |
| Ambient Temperature | 32 C | 89.6 F | Total Nu | mber of Curves | 23 | | | |
| Data Recorder Type | FM MULTIPL | EXOR TAPE RECO | ORDER | | Data Link | UMBILI | CAL CABLE | |
| Test Commentary | NO COMME | NTS | | | | | | |

Fixed Barrier Information

| Barrier Type | RIGID | Pole Barrier Diameter 0 |] mm | 0 | inches |
|--------------------|--------------|--------------------------------|------|---|--------|
| Barrier Shape | FLAT BARRIER | |] | | |
| Barrier Commentary | NO COMMENTS | | | | |

1987 HONDA ACCORD LEFT FRONT SEAT OCCUPANT

| Test # | 1054 | | | |
|------------|----------------------|--|---|-----|
| Vehicle # | 1 | | Sex MALE | |
| Location | LEFT FRONT SE | AT | Age 0 | |
| Position | CENTER POSITI | ON | Height 0 mm 0.0 inch | es |
| Туре | PART 572 DUM | ЛҮ | Weight 0.0 kg 0 pou | nds |
| Size | 50 PERCENTILE | | | |
| Cali | ibration Method | PART 572 | | |
| Occupar | nt Manufacturer | MFG: HUMANOID SYSTEMS | <u>S/N 357</u> | |
| Occupa | ant Modification | | | |
| Occu | pant Description | PART 572B DUMMY CALIBRA | ATION | |
| Occupa | ant Commentary | NO COMMENTS | | |
| Head to - | | Head | | |
| Windshie | elder Header | mm _ 15.4 inches | Head Injury Criteria (HIC) 315 | |
| | WindShield 472 | | HIC Lower Time Interval (ms) 65 | |
| | Seatback | mm 0.0 inches | HIC Upper Time Interval (ms) 101 | |
| | Side Header 147 | | | |
| | Side Window 229 | | | |
| Neck to Se | | mm [0.0] inches | | _ |
| _ | First Contact R | | | |
| S | Second Contact Re | egion (Head) | | |
| | | | | |
| | | <u>Chest</u> | | |
| Chest to - | Dech Coo | | | _ |
| | | | m to Door 99 mm 3.9 inches fip to Door 178 mm 7.0 inches | |
| Steering N | | nm [<u>17.9</u>] inches H nm [0.0] inches | lip to Door 178 mm 7.0 inches | 5 |
| | Severity Index 30 | | Peak Lateral Acceleration (g's) | 7 |
| | auma Index | | Thorax Peak Acceleration (g's) 45.6 | - |
| | | Belt Peak Load Newto | | |
| | • | Belt Peak Load Newto | | |
| First Co | | est/Abdomen) NONE | pound roloc | 7 |
| | e (| est/Abdomen) NONE | | 1 |
| | (en | | | _ |
| Knoch t- | Doch 470 | nm C.a. inches Knoos | | |
| Knees to | | | to Seatback 0 mm 0.0 inches | 5 |
| | = | 073 Newtons -1590 | | |
| Right Femt | | 237 Newtons -278.1 | pounds Force | 7 |
| | First Contact F | | | 4 |
| | Second Contact F | | | |

1987 HONDA ACCORD LEFT FRONT SEAT OCCUPANT

| Test # 10 | 054 | | | | | | |
|-------------------|----------------|--------------------|-------------|---------------|-----|--------|--|
| Vehicle # 1 | | | Sex | MALE | | | |
| Location | EFT FRONT S | EAT | Age | 0 | | | |
| Position C | ENTER POSI | ΓΙΟΝ | Height | 0 mm | 0.0 | inches | |
| Туре Р | ART 572 DUN | IMY | Weight | 0.0 kg | 0 | pounds | |
| Size 5 | 0 PERCENTIL | E | | | | | |
| Calibra | ation Method | PART 572 | | | | | |
| Occupant I | Manufacturer | MFG: HUMANOID SYST | EMS S/N 357 | | | | |
| Occupant | t Modification | UNMODIFIED | | | | | |
| Occupa | nt Description | PART 572B DUMMY CA | LIBRATION | | | | |
| Occupant | Commentary | NO COMMENTS | | | | | |
| | | | | | | | |
| | | Restraints | <u>8</u> | | | | |
| Restraint | # 1 PASSIV | E 3 POINT BELT | | | | | |
| Mounted | | | | | | | |
| Deployme | ent NOT AP | PLICABLE | | | | | |
| Restraint | Commentary | NO COMMENTS | | | | | |
| Restraint | # 2 DASHP | ANEL | | | | | |
| Mounted | | | | | | | |
| Deployme | ent NOT AP | PLICABLE | | | | | |

Restraint Commentary **NO COMMENTS**

1987 HONDA ACCORD RIGHT FRONT SEAT OCCUPANT

| Test # 1054 | |
|---|----------|
| Vehicle # 1 Sex MALE | |
| Location RIGHT FRONT SEAT Age 0 | |
| Position CENTER POSITION Height 0 mm 0.0 inches | |
| Type PART 572 DUMMY Weight 0.0 kg 0 pounds | |
| Size 50 PERCENTILE | |
| Calibration Method PART 572 | |
| Occupant Manufacturer MFG: HUMANOID SYSTEMS S/N 358 | |
| Occupant Modification | |
| Occupant Description PART 572B DUMMY CALIBRATION | |
| Occupant Commentary NO COMMENTS | |
| Head to - | |
| Windshielder Header 424 mm 16.7 inches Head Injury Criteria (HIC) 374 | \dashv |
| WindShield 546 mm 21.5 inches HIC Lower Time Interval (ms) 76.75 | \dashv |
| Seatback 0 mm 0.0 inches HIC Upper Time Interval (ms) 112.75 | |
| Side Header 155 mm 6.1 inches Side Window 150 mm 5.9 inches | |
| | |
| Neck to Seatback 0 mm 0.0 inches First Contact Region (Head) NONE Image: Contact Region (Head) Image: Contact Region (Head) | |
| Second Contact Region (Head) | |
| | |
| <u>Chest</u> | |
| Chest to - | |
| Dash 645 mm 25.4 inches Arm to Door 86 mm 3.4 inches | |
| Steering Wheel 0 mm 0.0 inches Hip to Door 216 mm 8.5 inches | |
| Seatback 0 mm 0.0 inches | |
| Chest Severity Index 294 Pelvic Peak Lateral Acceleration (g's) | |
| Thoracic Trauma Index Thorax Peak Acceleration (g's) 38.5 | |
| Lap Belt Peak Load Newtons 0.0 pound Force | |
| Shoulder Belt Peak Load Newtons 0.0 pound Force | |
| First Contact Region (Chest/Abdomen) NONE | |
| Second Contact Region (Chest/Abdomen) NONE | |
| Legs | |
| Knees to Dash 193 mm 7.6 inches Knees to Seatback mm 0.0 inches | |
| Left Femur Peak Load [-1935] Newtons [-435.0] pounds Force | |
| Right Femur Peak Load -2095 Newtons -471.0 pounds Force | |
| First Contact Region (Legs) DASHPANEL | |
| Second Contact Region (Legs) | |

1987 HONDA ACCORD RIGHT FRONT SEAT OCCUPANT

| Test # | 1054 | | | | | | | | |
|-----------|---------------|-----------|--------------------|-------------|------|----|-----|--------|--|
| Vehicle # | 1 | | | Sex | MALE | | | | |
| Location | RIGHT | FRONT | SEAT | Age | 0 |] | | | |
| Position | CENTE | R POSIT | ION |] Height | 0 | mm | 0.0 | inches | |
| Туре | PART 5 | 72 DUM | MY | Weight | 0.0 | kg | 0 | pounds | |
| Size | 50 PER | CENTIL | E |] | | | | | |
| Calib | bration N | Nethod | PART 572 | | | | | | |
| Occupar | nt Manuf | acturer | MFG: HUMANOID SYST | EMS S/N 358 | | | | | |
| Occupa | ant Modi | fication | UNMODIFIED | | | | | | |
| Occup | pant Des | scription | PART 572B DUMMY CA | LIBRATION | | | | | |
| Occupa | ant Comi | mentary | NO COMMENTS | | | | | | |
| | | | | | | | | | |
| | | | Restraints | <u>8</u> | | | | | |
| Restrair | nt # 1 [| PASSIV | E 3 POINT BELT | | | | | | |
| Mounte | d [| | | | | | | | |
| Deployr | ment [| NOT AP | PLICABLE | | | | | | |
| Restrair | nt Comm | nentary | NO COMMENTS | | | | | | |
| Restrair | nt#2 | DASHPA | NEL | | | | | | |
| Mounte | 2 | | | | | | | | |
| Deployr | | | PLICABLE | | | | | | |

Restraint Commentary NO COMMENTS

Vehicle 1 1987 HONDA ACCORD

| Test # | 1054 | | | | | | | | | |
|-----------------|---------------|----------------|-----------|-------------------|----------------------|------------|------------|---------------------------------------|-----------------|-------------|
| VIN | JHMCA | 5366HC095 | 583 | | NHTSA Te | est Vehic | le Numbe | er 1 | | |
| Year | 1987 |] | | | Vehicle Mo | dification | Indicator | PRODUCTIO | N VEHIC | LE |
| Make | HONDA | | Post-tes | st Steering C | Column Shear | Capsule | Seperatio | on UNKNOWN | | |
| Model | ACCOR | D | | Steer | ing Column Co | ollapse M | lechanisn | NOT APPLI | CABLE | |
| Body | THREE | DOOR HAT | СНВАСК | | | | | | | |
| Engine | 4 CYLIN | NDER TRAN | SVERSE | FRONT | | | | | | |
| Displacement | 2 | Liter T | ransmissi | ion MANU | AL - FRONT W | HEEL D | RIVE | |] | |
| Vehicle Modifie | cation(s) | Description | NO COM | MENTS | | | | | | |
| Vehicle Comm | nentary | INSTR PANE | L COVER | R BLOCKED | VIEW OF ST | EERING | COLUMN | I COLLAPSE | | |
| Vehicle Ler | ngth | 4440 mm | 174.8 | inches | CG | i behind I | Front Axle | e 1133 mm | 44.6 | inches |
| Vehicle | Width [| 1689 mm | 66.5 | inches | Center of D | Damage t | o CG Axi | s 0 mm | 0.0 | inches |
| Vehicle Whee | elbase | 2604 mm | 102.5 | inches | Total Leng | gth of Inc | lentation | 1549 mm | 61.0 | inches |
| Vehicle Test V | Veight [· | 1332 KG | 2936 | pounds | Maximum S | Static Cru | sh Depth | 437 mm | 17.2 | inches |
| | | | | | | Pre-Impa | ict Speed | d 48 kph | 29.5 | mph |
| Ve | hicle Dar | nage Index | 12FDEW | 2 | Princi | ipal Direc | tion of Fo | orce 0 | | |
| | | | | | | | | | | |
| Domogo Pr | ofilo Dia | stance Mar | ouromo | nto | Cruch from | n Dra 8 | Doct To | st Damage N | logguror | nonte |
| Damage Pr | | | | | Clushilo | | | | | |
| , | | -to-Right, Re | _ | , | 0 | Pre-Tes | | Post-Test | r | Depth |
| DPD 1 | | mm <u>15.4</u> | | | umper Corner | | inches | 155.6 inche | | _ inches |
| DPD 2 | | mm <u>16.2</u> | inche | | | 4343 | mm | 3952 mm | 391 | mm |
| DPD 3 | | mm <u>16.8</u> | | | Centerline | 174.8 | inches | 157.6 inche | es 17.2 | inches |
| DPD 4 | | mm 16.8 | inche | | | 4440 | mm | 4003 mm | 437 | mm |
| DPD 5 | | mm 16.4 | inche | Pight B | umper Corner | 171.0 | inches | 155.3 inche | es 15.7 | inches |
| DPD 6 | 399 | mm 15.7 | inche | s ragin b | | 4343 | mm | 3945 mm | 398 | |
| | | | | | | 1010 | | | | |
| Bumper E | Engagem | ient | | Sill E | ngagement | | | A-pillar | Engagem | nent |
| | npact On | | | | e Impact Only) | | | - | Impact Or | |
| | 0.0 | Ĵ | Г | | APPLICABLE | | | , , , , , , , , , , , , , , , , , , , | 0.0 | Τ́ |
| | | _ | | | - | | | | | |
| Moving | g Test Ca | ırt | | Moving | Test Cart/Veh | icle | | Vehicle O | rientation | on Cart |
| A | ngle | | | Cra | bbed Angle | | | Movir | ng Test Ca | ırt |
| | APPLICA | | | | 0.0 | | | | PPLICABI | |
| | of the Tilt A | | | - | of the Crabbed Ang | le | | - | ide of the Angl | |
| Measured b | etween surfa | ace of a | | | re Clockwise from | | | Measured betweel | 1 the Vehicle (| Orientation |
| Rollover Test | Cart and the | e Ground | Lo | ongitudinal Vecto | r to Velocity Vector | of Vehicle | | and Direction | of Test Cart | Motion |

Vehicle 1 1987 HONDA ACCORD

| Test # 1054 | | | | | | | | |
|---|--|---|--|--|--|--|--|--|
| VIN JHMCA5366HC095583 | NHTSA Test Vehicle N | umber 1 | | | | | | |
| Year 1987 | 1987 Vehicle Modification Indicator PRODUCTION VEHICLE | | | | | | | |
| Make HONDA Post | -test Steering Column Shear Capsule Sep | eration UNKNOWN | | | | | | |
| Model ACCORD | Steering Column Collapse Mech | anism NOT APPLICABLE | | | | | | |
| Body THREE DOOR HATCHBAC | СК | | | | | | | |
| Engine 4 CYLINDER TRANSVERS | SE FRONT | | | | | | | |
| Displacement 2 Liter Transm | ission MANUAL - FRONT WHEEL DRIVE | <u> </u> | | | | | | |
| Vehicle Modification(s) Description NO C | COMMENTS | | | | | | | |
| Vehicle Commentary INSTR PANEL COV | VER BLOCKED VIEW OF STEERING COL | | | | | | | |
| Vehicle Length 4440 mm 174 | .8 inches CG behind Fron | t Axle 1133 mm 44.6 inches | | | | | | |
| Vehicle Width 1689 mm 66. | inches Center of Damage to Co | G Axis <mark>0 mm 0.0</mark> inches | | | | | | |
| Vehicle Wheelbase 2604 mm 102 | .5 inches Total Length of Indenta | ation 1549 mm 61.0 inches | | | | | | |
| Vehicle Test Weight 1332 KG 293 | 6 pounds Maximum Static Crush I | Depth 437 mm 17.2 inches | | | | | | |
| | Pre-Impact S | speed 48 kph 29.5 mph | | | | | | |
| Vehicle Damage Index 12FD | EW2 Principal Direction | of Force 0 | | | | | | |
| | | | | | | | | |
| <u>Pre &</u> | Post Test Damage Measurem | <u>ents</u> | | | | | | |
| (Measurements are taken in a longitudinal direction | n. Except for Engine Block, all measurements are take from | n the Rear Vehicle Surface forward.) | | | | | | |
| Left Side | Centerline | Right Side | | | | | | |
| Pre-Test Post-Test | Pre-Test Post-Test | Pre-Test Post-Test | | | | | | |
| mm inches mm inches | mm inches mm inches | mm inches mm inches | | | | | | |
| | Length of Vehicle at Centerline | | | | | | | |
| | 4440 174.8 4003 157.6 | | | | | | | |
| | Engine Block | | | | | | | |
| | 417 16.4 417 16.4 | | | | | | | |
| 4343 171.0 3952 155.6 | Front Bumper Corner | 4343 171.0 3945 155.3 | | | | | | |
| | Front of Engine | | | | | | | |
| | 3891 153.2 3787 149.1 | | | | | | | |
| 3358 132.2 3322 130.8 | Firewall | 3353 132.0 3340 131.5 | | | | | | |
| | 3327 131.0 3279 129.1 | | | | | | | |
| 3058 120.4 3043 119.8 | Upper Leading Edge of Door | 3058 120.4 3051 120.1 | | | | | | |
| 3068 120.8 3030 119.3 | Lower Leading Edge of Door | 3053 120.2 3053 120.2 | | | | | | |
| 3035 119.5 3018 118.8 | Bottom of 'A' Post | 3028 119.2 3028 119.2 | | | | | | |
| 1732 68.2 1722 67.8 | Upper Trailing Edge of Door | 1730 68.1 1730 68.1 | | | | | | |
| 1791 70.5 1758 69.2 | Lower Trailing Edge of Door | 1775 69.9 1781 70.1 | | | | | | |
| | Steering Column | | | | | | | |
| | 2604 102.5 2593 102.1 | | | | | | | |
| C | Center of Seering Column to 'A' Post (Horiz | zontal) | | | | | | |
| | 406 16.0 376 14.8 | | | | | | | |
| C | Center of Steering Column to Headliner (Ve | ertical) | | | | | | |

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445

17.5

17.8

452

Registered Owner: 4N6XPRT SYSTEMS

Serial Number: 11R-030201SC01301

1987 HONDA ACCORD

NHTSA Crash Test - #1054 - Front Impact

Pre/Post Depths - Vehicle Width - Closing Speed - Trapezoidal Average

| Test Vehicle Weight = | 2936 pounds |
|-------------------------|-------------|
| Vehicle Closing Speed = | 29.5 mph |
| Test Crush Length = | 66.5 inches |

Pre/Post Collision Crush Depths (inches)

| | Left Side Crush | Centerline Crush | Right Side Crush | (Dece Side) |
|---------------|-----------------|------------------|------------------|--------------|
| (Driver Side) | 15.4 | 17.2 | 15.7 | (Pass. Side) |

| | | CRASH 3 Stiffness Coefficents | | | SMAC Stiffness |
|----------------------------------|----------|-------------------------------|-------|--------|----------------|
| | | <u>A</u> | В | G | <u> </u> |
| Minimum Crush = 15.4 inches | | | | | 130.0 |
| Using a Rated No Damage Speed of | 2.5 mph | 155.2 | 108.9 | 110.6 | |
| Using a Rated No Damage Speed of | 5.0 mph | 281.7 | 89.7 | 442.4 | |
| Using a Rated No Damage Speed of | 7.5 mph | 379.5 | 72.3 | 995.5 | |
| Using a Rated No Damage Speed of | 10.0 mph | 448.5 | 56.8 | 1769.7 | |
| Average Crush = 16.4 inches | | | | | 114.6 |
| Using a Rated No Damage Speed of | 2.5 mph | 145.8 | 96.0 | 110.6 | |
| Using a Rated No Damage Speed of | 5.0 mph | 264.5 | 79.1 | 442.4 | |
| Using a Rated No Damage Speed of | 7.5 mph | 356.4 | 63.8 | 995.5 | |
| Using a Rated No Damage Speed of | 10.0 mph | 421.2 | 50.1 | 1769.7 | |
| Maximum Crush = 17.2 inches | | | | | 104.2 |
| Using a Rated No Damage Speed of | 2.5 mph | 139.0 | 87.3 | 110.6 | |
| Using a Rated No Damage Speed of | 5.0 mph | 252.2 | 71.9 | 442.4 | |
| Using a Rated No Damage Speed of | 7.5 mph | 339.8 | 58.0 | 995.5 | |
| Using a Rated No Damage Speed of | 10.0 mph | 401.6 | 45.6 | 1769.7 | |

Rated No Damage Speed = Impact speed with a barrier

resulting in no permanant vehicle deformation Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific

vehicles may, however, have a higher rating

A = Maximum force per inch of damage without permanent damage, Ib/in

B = Crush resistance per inch of damage width (Crash), lb/in^2

G = Energy dissipated without permanent damage, lb

Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats Impact Speed (mph) = SQRT(30 * CF * max crush in feet)

| Crush | Maximum Crush | Calculated Impact Speed | Calculated Error | Calculated Error |
|--------|---------------|-------------------------|------------------|------------------|
| Factor | (inches) | (mph) | (mph) | (%) |
| 21 | 17.2 | 30.0 | 0.5 | 1.8 |

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.3

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

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Registered Owner: 4N6XPRT SYSTEMS

1987 HONDA ACCORD

NHTSA Crash Test - #1054 - Front Impact

Pre/Post Depths - Indention Length - Closing Speed - Trapezoidal Average

| Test Vehicle Weight = | 2936 pounds |
|-------------------------|-------------|
| Vehicle Closing Speed = | 29.5 mph |
| Test Crush Length = | 61.0 inches |

Pre/Post Collision Crush Depths (inches)

| | Left Side Crush | Centerline Crush | Right Side Crush | (Dece Side) |
|---------------|-----------------|------------------|------------------|--------------|
| (Driver Side) | 15.4 | 17.2 | 15.7 | (Pass. Side) |

| | | CRASH 3 Stiffness Coefficents | | | SMAC Stiffness |
|----------------------------------|----------|--------------------------------------|-------|--------|----------------|
| | | <u>A</u> | B | G | <u> </u> |
| Minimum Crush = 15.4 inches | | | | | 141.8 |
| Using a Rated No Damage Speed of | 2.5 mph | 169.3 | 118.8 | 120.6 | |
| Using a Rated No Damage Speed of | 5.0 mph | 307.2 | 97.8 | 482.4 | |
| Using a Rated No Damage Speed of | 7.5 mph | 413.8 | 78.9 | 1085.5 | |
| Using a Rated No Damage Speed of | 10.0 mph | 489.1 | 62.0 | 1929.7 | |
| Average Crush = 16.4 inches | | | | | 125.0 |
| Using a Rated No Damage Speed of | 2.5 mph | 158.9 | 104.7 | 120.6 | |
| Using a Rated No Damage Speed of | 5.0 mph | 288.5 | 86.2 | 482.4 | |
| Using a Rated No Damage Speed of | 7.5 mph | 388.6 | 69.5 | 1085.5 | |
| Using a Rated No Damage Speed of | 10.0 mph | 459.2 | 54.6 | 1929.7 | |
| Maximum Crush = 17.2 inches | | | | | 113.6 |
| Using a Rated No Damage Speed of | 2.5 mph | 151.5 | 95.2 | 120.6 | |
| Using a Rated No Damage Speed of | 5.0 mph | 275.0 | 78.4 | 482.4 | |
| Using a Rated No Damage Speed of | 7.5 mph | 370.5 | 63.2 | 1085.5 | |
| Using a Rated No Damage Speed of | 10.0 mph | 437.9 | 49.7 | 1929.7 | |

Rated No Damage Speed = Impact speed with a barrier resulting in no permanant vehicle deformation

A = Maximum force per inch of damage without permanent damage, Ib/in

B = Crush resistance per inch of damage width (Crash), lb/in^2 G = Energy dissipated without permanent damage, lb

Normal "Rated No Damage Speed" is 2.5 or 5 mph. Some Specific vehicles may, however, have a higher rating

Kv = Crush resistance per inch of damage width (SMAC), lb/in^2

4N6XPRT System's First Approximation Crush Factor (CF)

Speed from Crush calculation using a generic CF of 21 as suggested in Expert AutoStats Impact Speed (mph) = SQRT(30 * CF * max crush in feet)

| Crush | Maximum Crush | Calculated Impact Speed | Calculated Error | Calculated Error |
|--------|---------------|-------------------------|------------------|------------------|
| Factor | (inches) | (mph) | (mph) | (%) |
| 21 | 17.2 | 30.0 | 0.5 | 1.8 |

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.3

CF = (mph * mph) / (30 * max crush in feet), dimensionless

4N6XPRT Systems CF is calculated based upon the data reported and is specific to this vehicle and this test

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Available Test Results Front Impact Test Summary

Report Filter Settings

Year Range: 1986 - 1989 Make: HONDA Model: ACCORD

| Test Number | Vehicle Info | No Damage Speed (mph) | Average Crush (inch) | 0 | | ehicle ' iffness B | | | Crush Factor |
|-----------------------------------|--|--------------------------------|----------------------------|------|-------|--------------------------|-------|-------|-----------------|
| 897 | 1986 HONDA ACCORD FOUR DOOR SEDAN | 5.0 | 20.9 | 35.0 | 264.4 | 75.9 | 460.6 | 103.3 | 23.4 |
| 1054 | 1987 HONDA ACCORD THREE DOOR HATCHBACK | 5.0 | 16.4 | 29.5 | 265.3 | 79.5 | 442.4 | 115.3 | 21.3 |
| 1045 | 1987 HONDA ACCORD THREE DOOR HATCHBACK | 5.0 | 21.1 | 35.0 | 276.3 | 78.6 | 485.8 | 107.0 | 23.2 |
| | | Average (| AVG) | | 270.8 | 79.1 | 464.1 | 111.1 | 22.3 |
| | | Minimum | (MIN) | | 265.3 | 78.6 | 442.4 | 107.0 | 21.3 |
| Maximum (MAX) | | | (MAX) | | 276.3 | 79.5 | 485.8 | 115.3 | 23.2 |
| Standard Deviation (STDev-sample) | | | mple) | | 7.8 | 0.7 | 30.7 | 5.9 | 1.3 |
| | Nun | nber of Tes | sts (n) | 2 | | | | | |

4N6XPRT StifCalcs®

Available Test Results Front Impact Test Summary

Report Filter Settings

Year Range: 1986 - 1989 Make: HONDA Model: ACCORD

| Test Number | Vehicle Info | No Damage Speed (mph) | Max Crush (inch) | 0 | | ehicle iffness B | | | Crush Factor |
|-----------------------------------|--|--------------------------------|------------------------|------|-------|------------------------|-------|-------|-----------------|
| 897 | 1986 HONDA ACCORD FOUR DOOR SEDAN | 5.0 | 22.2 | 35.0 | 248.8 | 67.2 | 460.6 | 91.5 | 22.0 |
| 1054 | 1987 HONDA ACCORD THREE DOOR HATCHBACK | 5.0 | 17.2 | 29.5 | 252.2 | 71.9 | 442.4 | 104.2 | 20.3 |
| 1045 | 1987 HONDA ACCORD THREE DOOR HATCHBACK | 5.0 | 21.6 | 35.0 | 269.6 | 74.8 | 485.8 | 101.8 | 22.6 |
| | | Average (| AVG) | | 256.9 | 71.3 | 462.9 | 99.2 | 21.6 |
| | | Minimum | (MIN) | | 248.8 | 67.2 | 442.4 | 91.5 | 20.3 |
| | , | Maximum (| (MAX) | | 269.6 | 74.8 | 485.8 | 104.2 | 22.6 |
| Standard Deviation (STDev-sample) | | | mple) | | 11.2 | 3.8 | 21.8 | 6.7 | 1.2 |
| | Num | ber of Tes | sts (n) | 3 | | | | | |

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Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the front of the Plymouth Voyager was used, with the Stiffness Values from the range of tests for the Honda Accord as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on AVERAGE crush

| | | | - | | | | |
|------------------------------------|------------------|------------------------|-------------------|---------------------------|----------------|------------------|----------------|
| Curb Weight (pour | nds): 266 | 8 | PDOF | .ever Arm Dista | nce (inches |): | 0.00 |
| Occupant + Cargo Weight (pou | | 0 | | loment of Iner | | | 1542.04 |
| Total Weight (pour | 105): 200 | 0 | | | | , | |
| Angle Coll Force to Normal (degree | ees): 0 | .0 | "Known" S | Stifness Values | А | | В |
| No Damage Speed (m | 1ph): 5 | .0 | | Average | 268.7 | ′ | 78.0 |
| Energy Crush Depth (inc | hes): 3.2 | 8 | | Minimum | 264.4 | | 75.9 |
| Damage Length (inc | hes): 61 | .0 | | Maximum | 276.3 | | 79.5 |
| Crush Profile Measureme | ents: | 4 | St | d. Devation | 6.6 | i | 1.9 |
| | Unequal | | Zone | Area | Zon | e | Area |
| | Spacing | Zone Area | Depth(x) | Depth(x) | Depth | (y) [| Depth(y) |
| C1 (inches) 5.00 | (inches) | (inches ²) | (inches) | (inches²) | (inche | es) | (inches²) |
| C2 (inches) 3.00 | 17.00 | 68.00 | 2.04 | 138.83 | | 7.79 | 529.83 |
| C3 (inches) 3.00 | 14.00 | 42.00 | 1.50 | 63.00 | 2 | 1.00 | 882.00 |
| C4 (inches) 3.00 | 30.00 | 90.00 | 1.50 | 135.00 | 7 | 5.00 | 6750.00 |
| | | | | | | | |
| C5 (inches) | | | | | | | |
| C6 (inches) | | | | | | | |
| C7 (inches) | | | | | | | |
| C8 (inches) | | | | | | | |
| C9 (inches) | | | | | | | |
| C10 (inches) | | | | | | | |
| Average Crush (inches): | 3.28 | | | | | | |
| Results | | | Average | Demonst | KE | Dalka V | Closing |
| | А | В | Force (pounds) | Damage Energy (ft*lbs) | Speed (mph) | Delta V (mph) | Speed (MPH) |
| Minimum | 264.4 | 75.9 | 15654.20 | 8878.13 | 10.0 | 10.6 | 19.9 |
| Avg - 2 Std. Deviations | 255.5 | 74.2 | 15212.75 | 8577.21 | 9.8 | 10.4 | 19.7 |
| Avg - 1 Std. Deviations | 262.1 | 76.1 | 15604.05 | 8798.81 | 9.9 | 10.4 | 19.9 |
| Avg - 1 std. Deviations | 268.7 | 78.0 | 15995.35 | 9020.41 | 10.1 | 10.6 | 20.1 |
| Avg + 1 Std. Deviations \Box | 275.3 | 79.9 | 16386.65 | 9242.01 | 10.2 | 10.0 | 20.3 |
| - - | 273.3 | 81.8 | 16777.95 | 9463.61 | 10.2 | 10.7 | 20.5 |
| Avg + 2 Std. Deviations | 276.3 | 79.5 | 16777.15 | 9463.81 | 10.3 | 10.8 | 20.3 |
| Maximum | | | C2//.T2 | 9277.21 | | | |
| Damage Centroid Depth (x) (| | 1.68 | | | k ² | 2679.9 | _ |
| Damage Centroid Depth (y) (| | 40.81 | | Eff. Mass Ratio (| gamma) | 1.0 | U |
| Area of Damage (in | ches²): | 200.00 | | | | | |

1986 HONDA ACCORD LXI - Front Impact

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| | • | | | | |
|---|----------|------------------------|------------|---------|----------------------|
| Curb Weight (pounds): 3000 | PDOF | Lever Arm Distan | ce (inches | ю. Г | 0.00 |
| Occupant + Cargo Weight (pounds): 0 | | Noment of Inerti | | | 1747.00 |
| Total Weight (pounds): 3000 | | | | -) [| |
| Angle Coll Force to Normal (degrees): 0.0 | | | | | |
| No Damage Speed (mph): 5.0 | | | | | |
| Energy Crush Depth (inches): 3.73 | | | | | |
| Damage Length (inches): 61.0 | | | | | |
| Crush Profile Measurements: 4 | | | | | |
| | Zone | Area | Zon | ۵ | Area |
| Spacing Zone A | | Depth(x) | Depth | | epth(y) |
| (inches) (inches) | • | (inches ²) | (inch | | nches ²) |
| C1 (inches) 4.00 30.00 105 | .00 1.76 | 6 185.00 |] 🚺 1 | 4.29 | 1500.00 |
| | .50 1.70 | 6 104.83 | 2 | 5.90 | 1541.33 |
| | .00 2.20 | 6 142.33 |] 3 | 5.26 | 2221.33 |
| C4 (inches) 5.00 | | |] [| | |
| C5 (inches) | | | | | |
| C6 (inches) | | | | | |
| C7 (inches) | | | 」 」 | | |
| C8 (inches) | | | 」 」 | | |
| C9 (inches) | | | | | |
| C10 (inches) | | | | | |
| Average Crush (inches): 3.73 | | | | | |
| | Average | | KE | | |
| Results | Force | Damage | Speed | Delta V | |
| A B | (pounds) | Energy (ft*lbs) | (mph) | (mph) | bsub1 |
| Minimum 259.2 68.1 | 15654.20 | 9874.91 | 9.9 | 9.4 | 23.1 |
| Avg - 2 Std. Deviations 254.3 65.5 | 15212.75 | 9689.38 | 9.8 | 9.3 | 22.7 |
| Avg - 1 Std. Deviations 258.7 67.8 | 15604.05 | 9853.86 | 9.9 | 9.4 | 23.1 |
| Average 263.0 70.1 | 15995.35 | 10017.89 | 10.0 | 9.5 | 23.5 |
| Avg + 1 Std. Deviations 267.3 72.4 | 16386.65 | 10181.49 | 10.1 | 9.6 | 23.8 |
| Avg + 2 Std. Deviations 271.5 74.7 | 16777.95 | 10344.66 | 10.2 | 9.6 | 24.2 |
| Maximum 267.2 72.3 | 16377.15 | 10177.52 | 10.1 | 9.6 | 23.8 |
| Damage Centroid Depth (x) (inches) 1.90 | | | k² | 2700.10 | 5 |
| Damage Centroid Depth (y) (inches) 23.13 | | Eff. Mass Ratio (| gamma) | 1.00 |) |
| Area of Damage (inches ²): 227.50 | | | | | |

1994 PLYMOUTH VOYAGER 2WD - Front Impact

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To compare stiffness values between a Force-Balance approach and calculation from NHTSA Crash Tests, Force Balance calculations have been made on this crash test.

A FORCE-BALANCE approach for calculating stiffness values for the front of the Plymouth Voyager was used, with the Stiffness Values from the range of tests for the Honda Accord as the "Known Good" values.

The critical criteria in this analysis is -

A-B values based on MAXIMUM crush

| Curb Weight (pour | nds): 266 | 8 | PDOF | .ever Arm Distan | ce (inches |): | 0.00 |
|------------------------------------|-------------------|------------------------|-------------------|---------------------------|----------------|------------------|------------------------|
| Occupant + Cargo Weight (pour | | 0 | | loment of Inerti | | | 1542.04 |
| Total Weight (pour | nds): 266 | 8 | | | | - / | |
| Angle Coll Force to Normal (degree | ees): 0 . | .0 | "Known" S | Stifness Values | А | | В |
| No Damage Speed (m | 1ph): 5 | .0 | | Average | 256.9 | | 71.3 |
| Energy Crush Depth (incl | hes): 3.2 | 28 | | Minimum 🗌 | 248.8 | | 67.2 |
| Damage Length (inc | hes): 61 . | .0 | | Maximum | 269.6 | 5 | 74.8 |
| Crush Profile Measureme | onte: | 4 | St | d. Devation | 11.2 | 2 | 3.8 |
| | Unequal | <u>-</u> | Zone | Area | Zon | e | Area |
| | Spacing | Zone Area | Depth(x) | Depth(x) | Depth | | Depth(y) |
| C1 (inches) 5.00 | (inches) | (inches ²) | (inches) | (inches ²) | (inch | • | (inches ²) |
| | 17.00 | 68.00 | 2.04 | 138.83 | | 7.79 | 529.83 |
| C2 (inches) 3.00 | 14.00 | 42.00 | 1.50 | 63.00 | 2 | 1.00 | 882.00 |
| C3 (inches) 3.00 | 30.00 | 90.00 | 1.50 | 135.00 |] 7 | 5.00 | 6750.00 |
| C4 (inches) 3.00 | | | | | | | |
| C5 (inches) | | | | | | | |
| C6 (inches) | | | | | | | |
| C7 (inches) | | | | | | | |
| C8 (inches) | | | | | | | |
| C9 (inches) | | | | |] | | |
| C10 (inches) | | | | | _ | | |
| Average Crush (inches): | 3.28 | | | | | | |
| Results | | | Average | 5 | KE | | Closing |
| | А | В | Force (pounds) | Damage Energy (ft*lbs) | Speed (mph) | Delta V (mph) | Speed (MPH) |
| Minimum | 248.8 | 67.2 | 14308.40 | 8374.20 | 9.7 | 10.2 | |
| Avg - 2 Std. Deviations | 234.5 | 63.7 | 13522.25 | 7890.50 | 9.4 | 10.0 | |
| Avg - 1 Std. Deviations | 245.7 | 67.5 | 14243.85 | 8262.82 | 9.6 | 10.2 | |
| Average | 256.9 | 71.3 | 14965.45 | 8635.67 | 9.9 | 10.4 | |
| Avg + 1 Std. Deviations | 268.1 | 75.1 | 15687.05 | 9008.96 | 10.1 | 10.6 | |
| Avg + 2 Std. Deviations | 279.3 | 78.9 | 16408.65 | 9382.63 | 10.3 | 10.8 | |
| Maximum | 269.6 | 74.8 | 15702.80 | 9062.70 | 10.1 | 10.6 | 20.0 |
| Damage Centroid Depth (x) (| (inches) | 1.68 | | | k² | 2679 | .96 |
| Damage Centroid Depth (y) (| (inches) | 40.81 | | Eff. Mass Ratio (| gamma) | 1. | .00 |
| Area of Damage (in | ches²): | 200.00 | | | | | |

1986 HONDA ACCORD LXI - Front Impact

4N6XPRT StifCalcs® licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

| Curb Weight (po | | 00 | PDOF | Lever Arm Distan | ice (inches | 5): | 0.00 |
|-------------------------------|-------------------------|------------------------|----------|------------------------|--------------|------------------|-----------------------|
| Occupant + Cargo Weight (p | · · · | 0 | Yaw | Moment of Inerti | a (lb-ft-seo | - ²) | 1747.00 |
| Total Weight (po | ounds): 300 | | | | | | |
| ngle Coll Force to Normal (de | grees): 0 |).0 | | | | | |
| No Damage Speed | (mph): 5 | 0 | | | | | |
| Energy Crush Depth (i | inches): 3. 7 | 73 | | | | | |
| Damage Length (| inches): 61 | 0 | | | | | |
| Crush Profile Measure | manta | 4 | | | | | |
| Crush Profile Measure | Unequal | 4 | Zone | Area | Zon | ٩ | Area |
| | Spacing | Zone Area | | Depth(x) | Depth | | Depth(y) |
| | (inches) | (inches ²) | • • • • | (inches ²) | (inch | • | inches ²) |
| C1 (inches) 4.00 | | 105.00 | 1.7 | 6 185.00 |] 🚺 1 | 4.29 | 1500.00 |
| C2 (inches) 3.00 | 17.00 | 59.50 | 1.7 | 6 104.83 |] 2 | 25.90 | 1541.33 |
| C3 (inches) 4.00 | 14.00 | 63.00 | 2.2 | 6 142.33 |] [3 | 5.26 | 2221.33 |
| C4 (inches) 5.00 | | | | |] [| | |
| C5 (inches) | | | | |] [| | |
| C6 (inches) | | | | | 1 | | |
| C7 (inches) |] | | | | | | |
| C8 (inches) |] | | | | 」 | | |
| C9 (inches) |] | | 」 | | 」 | | |
| C10 (inches) |] | | | | | L | |
| Average Crush (inches): | 3.73 | | | | | | |
| Results | | | Average | | KE | | |
| Results | | 5 | Force | Damage | Speed | Delta V | |
| | A | B | (pounds) | Energy (ft*lbs) | (mph) | (mph) | bsub1 |
| Minimum | | 60.4 | 14308.40 | 9307.45 | 9.6 | 9.1 | 21.8 |
| Avg - 2 Std. Deviations | 234.8 | 55.9 | 13522.25 | 8973.25 | 9.5 | 8.9 | 20.9 |
| Avg - 1 Std. Deviations | | 60.0 | 14243.85 | 9280.08 | 9.6 | 9.1 | 21.7 |
| Average | | 64.1 | 14965.45 | 9585.19 | 9.8 | 9.3 | 22.4 |
| Avg + 1 Std. Deviations | 259.6 | 68.3 | 15687.05 | 9888.69 | 9.9 | 9.4 | 23.2 |
| Avg + 2 Std. Deviations | 267.5 | 72.5 | 16408.65 | 10190.67 | 10.1 | 9.6 | 23.9 |
| Maximum | 259.8 | 68.4 | 15702.80 | 9895.30 | 9.9 | 9.4 | 23.2 |
| Damage Centroid Depth (| x) (inches) | 1.90 | | | k² | 2700.10 | 5 |
| Damage Centroid Depth (| y) (inches) | 23.13 | | Eff. Mass Ratio (| gamma) | 1.00 | 2 |
| Area of Damage | (inches ²): | 227.50 | | | | | |

1994 PLYMOUTH VOYAGER 2WD - Front Impact

4N6XPRT StifCalcs $\ensuremath{\mathbb{R}}$ licensed by 4N6XPRT Systems (www.4N6XPRT.com) to:

Expert System Software for Litigation

8387 University Avenue La Mesa, CA 91942 Phone: (619) 464-3478 Fax: (619) 464-2206 Toll Free: 1- 800-266-9778

Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

Dear Conference Attendee,

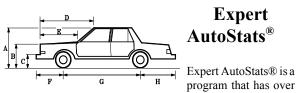
We at 4N6XPRT Systems were pleased to be able to provide you with the preceding data for the crash test vehicles.

Information regarding the Services available to you through our company, as well as the Programs used to create the data report follows this page.

We look forward to providing you similar information in the near future.

Sincerely,

Daniel W. Vomhof III Daniel W. Vomhof, Ph.D.



40,000 cars, pick-ups, vans, and utility vehicles that range in years from the 1940's to the present. Expert AutoStats® has specifications that can assist in reconstructing accidents when the data for the vehicle is unavailable or the vehicle is too severely damaged to get correct measurements.

For many vehicles mid-1960's to present, data such as bumper height, front and rear overhang, hood height, etc., are also included.

| ************************************** | | |
|--|--|---|
| 2001 FORD CROWN VICTORIA 4DR SEDAN | | |
| | 23 27 26 326 40 40 1 | in. in. in. in. in. lbs. |
| WIDTH 78 in. FRONT = 55% REAF FRONT TRACK 63 in. GROSS VEHICLE WEIGHT 51 REAR TRACK 64 in. GROSS VEHICLE WEIGHT 51 | 70 | lbs. |
| EXPERT AUTOSTATS(c) Reg.To:4N6XPRT Systems S/N:01R-930512 | | |
| ACCELERATION/BRAKING | 5 m .40]i 3 i 3 i 3 i 3 i 1 | ph :1 n. n. n. n. n. |
| ALL DISC - REAR ABS - OPFIONAL 3pt - front and rear, FRONT SEAT AIRBAGS 4spd AUTOMATIC N.S.D.C. = 1998 - 2001 = VALue not in Database | | |
| EXPERT AUTOSTATS(c) Reg.To:4N6XPRT Systems S/N:01R-930512 | AQO | 3201 |

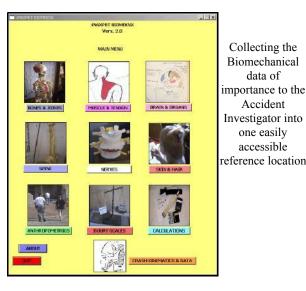
4N6XPRT BioMeknx[™]

data of

Accident

one easily

accessible



Biomechanics is the application of physics to describe, evaluate, or model living tissue and biological materials. Originally it was the application of the part of physics known as Mechanics to living systems. This is the same portion of physics which is used as the basis for much of accident reconstruction.

Biomechanics is important in many aspects of forensic work from vehicle accident reconstruction to slip-trip-stumble-fall cases. This particular program contains modules containing information on a variety of biomechanics and injury modalities, physical data found in the literature for failure of bone and tissue, calculation modules to evaluate individual specific parameters, and definitions and terminology used in the literature and found in medical reports.

4N6XPRT BioMeknx[™] is a program designed for the accident investigator. The BioMeknx program incorporates information from a number of different sources, as well as over 30 years of reconstruction experience. 4N6XPRT BioMeknx[™] compiles into one source a number of items of information to assist in reconstructing accidents by tying in the human component more tightly without the need to be a BioMechanics expert. Identification of body location, body part illustrations, failure threshold limits, definitions of terms, calculation modules for body link lengths, weights, stride lengths, and formulas for other types of calculations are only some of the material included in the program.

To gather into your library the material included in the 4N6XPRT BioMeknx[™], you would need a minimum of 10-15 Anatomy and Physiology, Human Factors, and Biomechanics books, as well as conduct over 50 hours of internet research.

Expert VIN 3FAPP1280MR117253 **DeCoder**[®]

Expert VIN DeCoder® is a program that "DeCodes" the 17 character VIN number for Cars, Vans, Pickups, and

Utility vehicles manufactured from 1981 to the present.

Cars/Vans/Utility/Lt. Trucks Modules: 1981 to Present

Ford Mercury/Lincoln Chrysler/AMC/Jeep European Import

Chevrolet/Geo Pontiac / Buick / Oldsmobile Cadillac/Saturn Asian Import



The 4N6XPRT Ped & Bike Calcs®) program is a program that provides FIRST ESTIMATE calculations to evaluate the speed of a vehicle involved in striking a pedestrian or bicyclist, IF Vehicle, scene, and pedestrian {or pedestrian and bicycle in a vehicle-bike accident} measurements are available. This program may also be used when skateboards or roller skates are involved.



>>>Calculate Time given D & V<<

45

Enter Distance (in feet) :

Enter Velocity (in mph)

Expert Qwic Calcs®

quickly provides answers to

questions important in vehicle collision litigation. The user inputs data in response to relevant

questions, Expert Qwic Clacs® performs the mathematical calculations required. Both the input data and the calculated result are then displayed, and may be "dumped" to a printer.

When the law enforcement accident report gives insufficient information to do a full - blown accident reconstruction, Expert Qwic Calcs® may be used to "scope out"the parameters of speeds, times, and distances to determine these relationships in a vehicle accident.

Expert TireStuf[®]



The Expert TireStuf® program is a Menu Driven program which has 19 modules explaining the various tire size designation systems, the information which MAY be in the DOT tire number, the DOT mandated Tire Grading system, Lug

Nut Tightening and Tire Rotation schemes, Mix and Match precautions, a glossary of Tire Terms, and Addresses of a few of the sources of additional information on tires and rims.

Also included is a calculation of the number of revolutions in one mile given the tire dimensions.



4N6XPRT StifCalcs[®]. Is a program which puts the NHTSA Crash Test database at your fingertips with no need to access the internet!

In addition to the NHTSA Crash Test data, the program includes a "Sister/Clone List Reader" developed in cooperation with Greg Anderson. This allows quick retrieval of the "Sister/Clone" data for the desired vehicle. This will drive the initial selection of the available tests. Alternatively, we have an ADVANCED SEARCH module for the initial vehicle selection.

STIFFNESS DATA, based on the selected test, is automatically calculated based on the reported crush depths and widths for front, side, and rear tests.

To use the program, follow this "Yellow Brick Road":

| b): | Sister/Clone Reader - |
|------------|---|
| | (a) - Select YEAR (b) - Select Manufacturer (c) - Select Model |
| | |
| ŋ | Click on TEST SELECTION Tab |
| | |
| 3) | Select a test from the available tests which are displayed |
| | |
| 4) | View TEST INFORMATION |
| | |
| 5) | View OCCUPANT DATA |
| | |
| Ŋ | View VEHICLE DATA |
| | |
| 7) | View STIFFNESS CALCS |
| | |
| 3) | Click on Reports - PRINT REPORT |

IT'S THAT SIMPLE REALLY!!

Please use this order form when ordering. Due to conditions and rising costs beyond our control, Shipping & Handling for program orders must be paid per the included schedule.

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|-----------------------|-------------|
| Title: | |
| Company/Organization: | |
| Street: | |
| City: | State: Zip: |
| Phone: () | FAX: () |
| E-Mail: | |

PAYMENT BY: Check Money Order Govt. Purchase Order

for Credit Card Orders, please circle Credit Card type: Am. Express / Visa / MasterCard, then complete the following:

| Card Number: | | | Expiration Date | (MM/YY):/ |
|------------------------------------|-----------------------|-------------------------------|-----------------------|-------------|
| Security c | ode (card ID) on back | of Visa/MasterCard card or fr | ont of American Expre | ss Card: |
| 1524 4678 8912 345 (12) Card ID | ←Visa/MasterCard | Security | American Express → | 3112 0 1500 |

Address for where the credit card bill is sent:

(This is the address that the credit card bill would go to, not where we would send the data or product to)
 Zip for where the credit card bill is sent:
 (This is the zip code that the credit card bill would go to, not where we would send the data or product to)
 Authorized signature:

| | M ORDER FORM: prices subject to change without | notice) | Indi |
|--|---|---------------|----------------|
| Expert AutoStats [®] : | \$ 595.00 * | \$ | |
| 4N6XPRT BioMeknx [™] : | \$ 495.00 * | \$ | |
| 4N6XPRT Ped & Bike Calcs [®] : | \$ 375.00 * | \$ | |
| Expert Qwic Calcs [®] : | \$ 275.00 * | \$ | |
| Expert TireStuf [®] : | \$ 85.00 * | \$ | YEAR & MAKE:_ |
| 4N6XPRT StifCalcs [®] : | \$ 600.00 * | \$ | MODEL: |
| Expert VIN DeCoder [®] : | \$ 525.00 * | \$ | MODEL |
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| | SUB-TOTAL | \$ | |
| California shipping addresses add | | \$ | |
| (California orders delivered e | | αues iux j | |
| | TOTAL | | |

dividual Vehicle Data FAX/Order Form

Expert VIN Decoder & Expert AutoStats
 INHTSA Crash Test Results
 BOTH
 Please circle ALL OPTIONS that apply

AKE:_____

are requesting VIN DeCoder & AutoStats please also provide:

Vehicle Type:Car - Pickup - Utility - Van No. of Doors:2/3/4/5 Car Body Style:Coupe/Conv./Sedan/Wagon DRIVE WHEELS: 4x2 / 4x4 KUPS:Dual Rear Wheel - Std. / Extra / Super / Crew Cab - Short Bed / Long Bed VANS:Cargo / Passenger - Short / Long Wheelbase

VIN Information

 1
 2
 3
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 9

 10
 11
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 14
 15
 16
 17

 NHTSA Crash Test Information

Impact location - Front / Side / Rear Impact Speed - Lower / Higher

Case Reference/Number:_____

Individual Vehicle Data Search Service[®]

Charges & Services

Individual Vehicle Specifications \$40.00-First vehicle*, \$35.00/Additional Vehicles*, \$20.00/Additional Similar Model*

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> <u>NHTSA Crash Test Results</u> 00 per test - Includes A B & G vz

\$40.00 per test - Includes A, B, & G values Calculations are based on the test results

Individual Vehicle Specifications

Now you can get the Expert AutoStats® data for the vehicles in your case **QUICKLY**, **EASILY**, and **ECONOMICALLY**, instead of guessing, or begging a printout from a friend.

Our vehicle database includes dimensions on over 35,000 Cars, Vans, Lt. Pickups, and Utility Vehicles covering 1945 to the present.

Minimum Vehicle specifications include:

| Overall Length | Curb Weight |
|---|----------------------------------|
| Overall Width | Weight Distribution |
| Overall Height | Front/Rear Track |
| Wheelbase | CG Location |
| Model years with No Signific VIN DeCoding when VIN availa | is provided Information |
| Mid-60's to present also in | cludes (<i>when available</i>) |
| Front/Rear Overhang | Bumper Heights |
| Hood height | Turning Circle |
| Bumper-to-hood | Ground-to-hood |

Dimensions are given in both Imperial and metric (SI) units. Motorcycle specifications will be similar to the Vehicle specifications with appropriate changes where applicable.

NHTSA Crash Test Results

Test results include: General Test information, Barrier Data when provided, Vehicle Data as reported by the testing organization, Occupant (Dummy) data when provided, and A-B-G Stiffness calculations based on the test results.

4N6XPRT Systems®

Providing Vehicle dimensional data, VIN DeCoding, and NHTSA Crash Test Results as a service to the Litigation community, in the form of:

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Expert VIN DeCoder®

Expert VIN DeCoder® is a program that "DeCodes" the 17 character VIN number for vehicles manufactured from 1981 to the present.

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Chevrolet/Geo Cars Pontiac/GM of Canada Cars Oldsmobile Cars **Buick Cars** Cadillac/Saturn Cars General Motors Vans/Utility/Lt. Trucks

Chrysler/AMC/Jeep Cars Chrysler/Jeep Vans/Utility/Lt. Trucks

European Import Cars/Vans/Utility/Lt. Trucks Asian Import Cars/Vans/Utility/Lt. Trucks

SYSTEM REQUIREMENTS

Expert VIN DeCoder® has been tested on a wide variety of IBM laptop and desktop clones ranging from 8088 through Pentium® chips. A math coprocessor chip is NOT required. Expert VIN DeCoder® has also been tested under the various versions of MS-DOS 3.0 thru 7.0, DrDOS 6.0, and PC DOS 7.0. It also works as a DOS program under Windows 3.x, Windows, 95, Windows 98, Windows NT, OS/2 2.x, OS/2 Warp, and various versions of LINUX.

A variety of dot matrix printers emulating the EPSON series have been used with no difficulty. The output is also compatible with the Hewlett-Packard II, IIP, III and IIIP Laser printers. Expert VIN DeCoder® works with monochrome and color monitors.

As of April 1995 the 4N6XPRT Systems® programs Expert AutoStats®, Expert Qwic Calcs®, Expert TireStuf®, 4N6XPRT Ped & Bike Calcs®, and Expert VIN DeCoder® are accessible from within RECTEC.

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Web: http://www.4n6xprt.com E-Mail: VIN@4n6xprt.com

1-800-266-9778

INPUT:1)Enter VIN Numbers to be DeCoded: 3FAPP1280MR117253

3FA PP128 0 MR 117253

2)

Is this the VIN Number to be DeCoded (Y/N)? **Y**

OUTPUT:

| EXPERT VIN DeCoder | | | | | |
|--|--|--|--|--|--|
| The VIN Number is 3FA PP128 0 MR 117253 | | | | | |
| The vehicle should be a 1991 Ford The model: Escort 2/3-door Hatchback GT The assembly plant: Hermosillo, Mexico The 4 passenger vehicle had : Passive (Automatic) Front Belts | | | | | |
| The OEM engine was: In-line 4 cylinder with Double Overhead Cam Engine Displacement/Type = 1.8 L/ 112 cu.in. L4, DOHC Brake Horsepower (SAE) = 127 @ 6500 rpm Torque (SAE) = 114 lb-ft at 4500 rpm Engine manufacturer = Mazda | | | | | |
| The fuel distribution system: Electronic Fuel Injection (EFI) Fuel pump/line pressure = 35-45 psi The ignition system = electronic | | | | | |
| This is a Front Wheel Drive vehicle. | | | | | |
| The first three characters {3, F, A} indicates that the vehicle was a Ford made in Mexico | | | | | |
| The fourth character {P} indicates the vehicle had Passive (Automatic) Front Belts | | | | | |
| The fifth character {P} indicates it was a Passenger Car | | | | | |
| The sixth with the seventh character {12} indicates a Escort 2/3-door Hatchback GT | | | | | |
| The eighth character {8} indicates the OEM engine : 1.8 L/ 112 cu.in. L4, DOHC | | | | | |
| The 9th Character { the Check Digit } is 0 The calculated Check Digit value is 0 | | | | | |
| The tenth character {M} indicates the Model Year was 1991 | | | | | |
| The eleventh character {R} indicates it was made at the assembly plant in Hermosillo, Mexico | | | | | |
| The twelveth through the seventeenth characters { 117253 } is the Serial Number unique to this vehicle. | | | | | |
| 01-01-2001 S/N:930114VD01201 Reg. User: 4N6XPRT SYSTEMS | | | | | |

Expert AutoStats®

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As of April 1995 the 4N6XPRT Systems® programs Expert AutoStats®, Expert Qwic Calcs®, Expert TireStuf®, and Expert VIN DeCoder® are accessible from within RECTEC.

SYSTEM REQUIREMENTS

Expert AutoStats® has been tested on a wide variety of IBM laptop and desktop clones ranging from 8088 through Pentium® chips. A math coprocessor chip is NOT required. Expert AutoStats® has also been tested under the various versions of MS-DOS 3.0 thru 7.0, DrDOS 6.0, and PC DOS 7.0. It also works as a DOS program under Windows 3.x, Windows, 95, Windows 98, Windows NT, Windows Me, Windows 2000, Windows XP, Windows Vista, OS/2 2.x, OS/2 Warp, and various versions of LINUX.

A variety of dot matrix printers emulating the EPSON series have been used with no difficulty. The output is also compatible with the Hewlett-Packard II, IIP, III and IIIP Laser printers and Hewlett-Packard Desk Jet inkjet printers. Expert AutoStats® works with monochrome and color monitors.

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| Billing Zip: | |

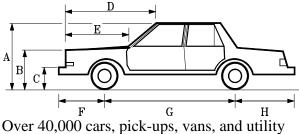
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vehicles 1940's to the present are represented.

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1-800-266-9778

Select Your Vehicle

| MAKE OF Year of Bodysty | VEHICLE | FORD 2001 Car | | | | |
|-------------------------------|---------|---------------------|--|--|--|--|
| 2012/01/2012/01 | | | | | | |

More than one model matches the make, year, and body style you specified. Select the actual model from the list. Use the arrow keys to highlight the model, then press Enter. Press Esc to return to the list of manufacturers. (You can also begin typing the name of the model to jump directly to it.)

| | ORD **] | [WB(in) | OAL(in)]] |
|--|-----------------|----------|------------|
| CROWN VICTORIA | 4DR SEDAN | 115 | 212 |
| CROWN VICTORIA (CNG) MSP POLICE PACKAG | 4DR SEDAN | 115 | 212 |
| CROWN VICTORIA 4.6L MSP POLICE PACKAGE | 4DR SEDAN | 115 | 212 |
| CROWN VICTORIA EXTENDED | 4DR SEDAN | 121 | 218 |
| ESCORT | 4DR SEDAN | 98 | 175 |
| ESCORT ZX2 | 2DR COUPE | 98 | 175 |
| FOCUS | 4DR SEDAN | 103 | 175 |
| FOCUS | 4DR WAGON | 103 | 178 |
| FOCUS ZX3 | 2DR HATCHBACK | 103 | 168 |
| MUSTANG | 2DR CONVERTIBLE | 101 | 183 |
| MUSTANG | 2DR COUPE | 101 | 183 |
| MUSTANG COBRA | 2DR CONVERTIBLE | 101 | 183 |
| MUSTANG COBRA | 2DR COUPE | 101 | 183 |

After typing in the Make, Year, and Type of vehicle, you are presented with the vehicles which are available for that year.

Screen 1

| | | OLICE PACKAGE 4DR SEDAN | |
|--|---------|-------------------------|-----------|
| E HORIZONTAL DIMENSIONS] | | [VERTICAL DIMENSION | \$] |
| LENGTH Wheelbase Front Bumper to Front Axle | 212 in. | HEIGHT | 57 in. |
| WHEELBASE | 115 in. | GROUND TO: | |
| FRONT BUMPER TO FRONT AXLE | 44 in. | FRONT BUMPER (Top) | 23 in. |
| FRONT BUMPER TO FRONT OF HOOD | 8 in. | HEADLIGHT - Center | 27 in. |
| FRONT BUMPER TO BASE OF WINDSHIELD | 66 in. | HOOD - Top Front | 29 in. |
| FRONT BUMPER TO TOP OF WINDSHIELD | 91 in. | BASE OF WINDSHIELD | 38 in. |
| FRONT BUMPER TO FRONT WELL REAR BUMPER TO REAR OF REUNK | 27 in. | REAR BUMPER (Top) | 26 in. |
| REAR BUMPER TO REAR OF TRUNK | 8 in. | TRUNK - Top Rear | 40 in. |
| REAR BUMPER TO BASE OF REAR WINDOW | 39 in. | BASE OF REAR WINDOW | 40 in. |
| REAR BUMPER TO REAR WELL | | | |
| REAR BUMPER TO REAR AXLE | 53 in. | WEIGHT DIMENSIONS | |
| | | CURB WEIGHT | 4020 lbs. |
| [DEPTH DIMENSIONS] | | | .on: |
| WIDTH | 78 in. | FRÖNT = 55% RE | AR = 45% |
| FRONT TRACK | 63 in. | | |
| REAR TRACK | 64 in. | GROSS VEHICLE WEIGHT | 5170 lbs. |
| | | | |
| Diript this corpor | ONU | OTHER KEY = Continue | |

The first screen of data contains exterior dimensions and weight data. Length, Height, Wheelbase, Width, and Weight Distribution are published dimensions. Curb Weight is an average of published curb weights for the given vehicle. Detail dimensions such as the bumper heights and Front Bumper to Front of Hood are measurements obtained by our staff from actual vehicles.

Screen 2

| 2001 FORD CROWN VICTORIA 4.6L H | SP POLICE PACKAGE 4DR SEE | DAN |
|---|---------------------------|------------------------------|
| | STEERING RATIO | 16.40:1 SIONS] 61 in. |
| DRIVE WHEELS REAR TURNING CIRCLE (DIAMETER) 41 ft. NUMBER OF WHEELS 4 WHEEL RADIUS 13 in. TIRE SIZE P225/60R16 | I REAR SHOULDER ROOM | 43 in. 60 in. |
| ALL DISC - ALL WHEEL ABS 3ot - front and rear, FRONT SEAT AIRBAGS 4spd AUTOMATIC N.S.D.C. = 2001 - 2001 = Value not in Database | S | |
| B)ack a screen, P)rint this scre | een, ANY OTHER KEY = | Continue |

The second screen of data contains interior dimensions and various performance data. The data contained in the second screen comes from various published sources.

Screen 3

| 2001 FORD CROWN VICTORIA 4.6L MSP | |
|--|---|
| ANGLE FRONT BUMPER TO HOOD FRONT ANGLE FRONT OF HOOD TO WINDSHIELD BASE ANGLE FRONT OF HOOD TO WINDSHIELD TOP ANGLE OF WINDSHIELD ANGLE OF STEERING TIRES AT MAX TURN ANGLE OF STEERING TIRES AT MAX TURN | REMENIS = 36.9 deg = 8.8 deg = 17.4 deg = 34.2 deg = 26.8 deg RAVITY |
| Inches from ground = 22.37 Inc Inches behind front axle = 51.75 Inc Inches from front bumper = 95.75 Inc | hes from side of vehicle = 39.00 hes in front of rear axle = 63.25 |
| TIP-OVER STABILITY RATIO NHTSA Static Stability Factor (calculated |) Star Rating: **** |
| YAN NOMENT OF INERTIA PITCH MOMENT OF INERTIA ROLL MOMENT OF INERTIA | = 2934.60 lb-ft-sec ² = 2830.80 lb-ft-sec ² = 573.60 lb-ft-sec ² |
| B)ack a screen, P)rint this scree | n, ANY OTHER KEY = Continue |

The third and last screen contains a number of calculated items of information which may be of use depending upon the type of case, the other software that you use, and the questions which need to be answered.

Screen 4

| 2001 FORD CROWN VICTORIA 4.6L HSP | POLICE PACKAGE 4DR SEDAN |
|---|---|
| I ANGLE FRONT BUMPER TO HOOD FRONT INGLE FRONT OF HOOD TO MINOSHIELD BASE INGLE FRONT OF HOOD TO WINDSHIELD BASE INGLE FRONT OF HOOD TO WINDSHIELD TOP INGLE OF WINDSHIELD INGLE OF STEERING TIRES AT MAX TURN I CENTED OF STEERING TIRES AT MAX TURN | = 36.9 deg = 8.8 deg = 17.4 deg = 34.2 deg = 26.8 deg |
| Inches from ground = 22.37 Incl Inches behind front axle = 51.75 Incl Inches from front bumper = 95.75 Incl Inches from front corner = 103.39 Incl | hes from side of vehicle = 39.00 hes in front of rear axle = 63.25 hes from rear bumper = 116.25 |
| IP-OVER STABILITY RATIO HHTSA Static Stability Factor (calculated | = 1.42 |
| VAN MOMENT OF INERTIA PITCH MOMENT OF INERTIA ROLL MOMENT OF INERTIA | = 2934.60 lb-ft-sec [*] 2 = 2830.80 lb-ft-sec [*] 2 = 573.69 lb-ft-sec [*] 2 |
| Next Car, Print to - P)rinter or to F) | e, E)xchange File, D)XF File, D)u |

From within the Expert AutoStats program you have the ability to output the data to a 2-D DXF file for importation into your CAD Scene Drawings. The screen below shows an import of the DXF file with Text into the CAD Zone program.

CADZONE Import

| The Crash Zone 8.1 - [5 | | |
|---|---|------|
| | gs Text/Dimension Utilities Recon 30 Window Help | 1916 |
| | ≝ - ~ ■■■ #% ™ # 5 ₩ 8 0 0 0 0 0 0 0 0 0 0 | |
| Line Types | < | , |
| | DXF Output Data | |
| Eat Text / Dimensions View B 3D Tools C Recon S Imbols Templates Forms | Front bumper to Front Ade 3.67 Feet Wheebase 9.56 Feet Front Track: 5.25 Feet Rear Track: 5.33 Feet CG behind Front Avie: 4.31 Feet | |
| 2 Learning Center | | |

4N6XPRT StifCalcs®

Introducing 4N6XPRT StifCalcs[®]. A program which puts the NHTSA Crash Test database at your fingertips with no need to access the internet!

In addition to the NHTSA Crash Test data, the program includes a "Sister/Clone List Reader" developed in cooperation with Greg Anderson. This allows quick retrieval of the "Sister/Clone" data for the desired vehicle. This will drive the initial selection of the available tests. Alternatively, we have an ADVANCED SEARCH module for the initial vehicle selection.

STIFFNESS DATA, based on the selected test, is automatically calculated based on the reported crush depths and widths for front, side, and rear tests.

SYSTEM REQUIREMENTS

4N6XPRT StifCalcs[®] is a MS-Windows program designed to work under a 32 bit (95/98/Me/NT/ 2000/XP/Vista) Windows System.

| Ve | hicle 2 - | 1988 PI VI | MOUTH VOYAC | ER VA | N | | | |
|--|--|--|--|---|---|--|---|--|
| | | | | | 8833 | | | |
| | | Vehicle 1 | | | | | | |
| ed.# 1352 | NHTS/ | K Test Vehicle Nue | nber (C.0904 | | ~ | N (394F) | H2105JR | 596919 |
| 1933 Make PLYNDUTH | Nodel | VOVAGER VAN | Body | WAN | | | | |
| FRIME A CYLINDER TRANSVERSE P | HONT | Displacement | 25 Liter Transmission | MANULAL - P | FRONTWA | EEL DAM | E | _ |
| which Modification Indicator | | ication(s) Descriptio | on | | | | | |
| PRODUCTION VEHICLE | UNMODIFIED | | | | | | | |
| Post-lesi Steering Column Shear Capu | de Seceration | IDT APPLICABLE | Steering Column Collapse | Markagen 1 | NOT APPL | CALLE | | |
| | | | precent contrar conduct | PROVINGENDER 1 | | | | |
| | | | serving contact couple | Proceeding of the | 2. | | | _ |
| Vaticle Connections (NO COMMENT | 5 | | | | 2. | | | _ |
| Vaticle Connections (NO COMMENT | 5 | 176 inches | Vehicle Te | | 1559 | | 3437 | sounds |
| Vehicle Converties/ JNO DOMMENT Vehicle Length | 5 13 mm | | Vellacie Te | | 2. | кв Г | 1 | sounds nather |
| Vahiala Commertany (HO CONMENT Vahiala Length 440 Vahiala Wheelbace 38 | 5 13 mm | 176 inches 112 inches | Vellacie Te | it Weight le Width | 1559 | ks [| 72 | nchece |
| Vahida Daramerkay (NO DOMKENT Vahida Length 448 Vahida Whaabaaa 38 O3 bahnd Front Ada 111 | 5 10 nm 12 nm 15 nm | 176 anches 112 inches 45 anches | Vetticle Ter Vettic | it Weight - le Width - destation - | 1559 1829 1829 | ks [| 72 | nches nches |
| Vahisle Convention (NO COMMENT Vehicle Length 446 Vahisle Vahadbase 38 OS behind Freet Asle 111 Geter of Danage to CS Asis | 5 10 mm 12 mm 17 mm 17 mm | 176 inches 112 inches 45 inches 0 inches | Vehicle Ter Vehic Total Length of Iv Hanimum Static Cru | it Weight le Width destation sh Depth | 1559 1829 1829 249 | | 72 72 10 | nchez nchez nches |
| Vahish Daweerker, Jup DONNE HT Vehish Length 446 Vahish Wheathare 33 OS behind Proof Ade 111 Greter of Danage India Intel Danage India | 5 E nes E nes E nes 5 nes O nes Pércipal Disc | 176 inches 112 inches 45 inches 0 inches dien of Force 19 | Voliacle Ter Voliac Total Langth of In Hasimum Static Cru D Pro-Japa | it Weight le Width destation oh Depth ect Speed | 1559 1629 1629 249 | kis (nan (nan (han (| 72 72 10 0 | nchez nchez nchos nph |
| Valacia Convertino: Juo CONVENT Valacia Leogia 440 Valacia Valacia 33 Obiende Trost Ade 111 Center of Dianege India 9380 EV/22 Damage Profile Distant | 5 E nes [E nes] E nes] E nes] E nes] Pércipal Disc Ince Measu | 176 inches 112 inches 45 inches 0 inches dien of Force 19 | Vehicle Te Vehic Total Length of In Hasimun Static Tru Total Tength True Length | it Weight le Width destation sh Depth iet Speed Post Ter | 1959 1829 1829 249 54 Dam | kis (nan (nan (han (han (| 72 72 10 0 easur | nches nches nches nches nches nches |
| Valeta Connectory (20 COMENT Velocida Length 446 Valeta Wheathane 380 Cost and Front Adde 1113 Context of Decoge In CE Adde Valeta Danage In Charlos DecaDavia Diamage Profile Dectal Messarel Let Vorfige. | 5 E nes [E nes] E nes] E nes] E nes] Pércipal Disc Ince Measu | 176 inches 112 inches 45 inches 0 inches diand/Force (19 rements | Vehicle Te Vehic Total Langth of In Maximum Static Cru Maximum Static Cru Distribution Provide <u>Provide</u> | t Weight le Width destation sh Depth et Speed Post Ter | 1559 1629 1629 249 249 st Dam | ka C | 72 72 10 0 | nchez nchez nches neh sements <u>sel</u> tr |
| Vehicle Generative / BUO COMPENT Vehicle Length 448 Vehicle Vehicle and 337 OS behaved from Adva 117 Center of Damage In/CE Adva Vehicle Demage In/CE Adva Vehicle Demage In/CE Data | 5 E nes [E nes] E nes] E nes] E nes] Pércipal Disc Ince Measu | 176 inches 112 inches 45 inches 0 inches dam of Force (19 rements | Vehicle Te Vehic Total Langth of In Maximum Static Cru Maximum Static Cru Distribution Provide <u>Provide</u> | it Weight le Width dentation sh Depth ret Speed Post Te | 1959 1829 1829 249 54 Dam | ki na na kan kan kan kan kan kan | 72 72 10 0 0 0 0 0 0 0 0 0 | nches nches nches nches nches nches |

To use the program, follow this "Yellow Brick Road":

1) Sister/Clone Reader -(a) - Select YEAR (b) - Select Manufacturer (c) - Select Model

2) Click on TEST SELECTION Tab

V

3) Select a test from the available tests which are displayed

4) View TEST INFORMATION
5) View OCCUPANT DATA

View VEHICLE DATA

6)

7)

View STIFFNESS CALCS

V

8) Click on Reports - PRINT REPORT



PLEASE PRINT

| Contact Name: |
|---|
| Company/Dept: |
| Mailing Address: |
| City:State:Zip: |
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| Fax: |
| E-Mail: |
| (E-mail address required for electronic delivery) |
| StifCalcs [®] (copies) x \$600.00 = \$ |
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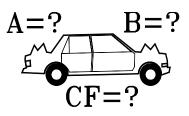
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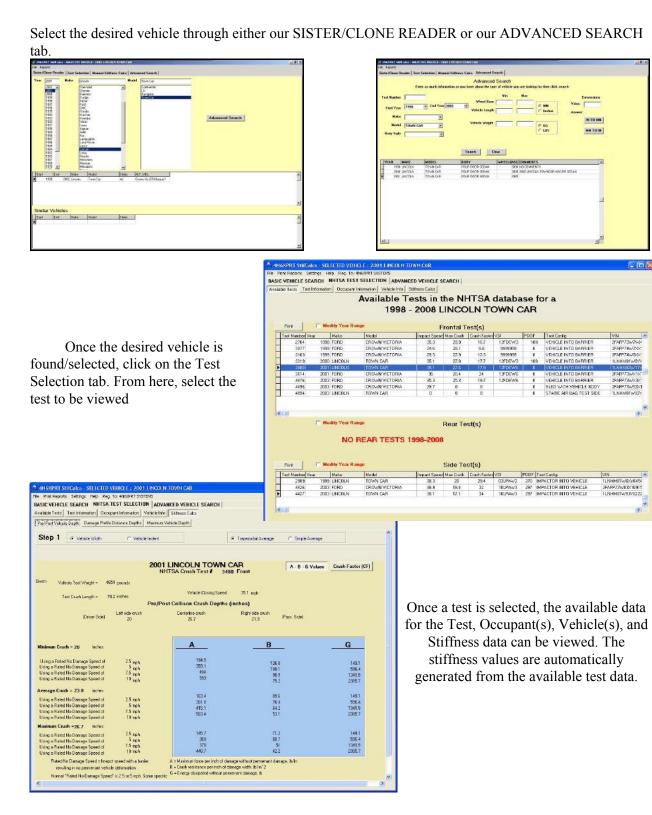


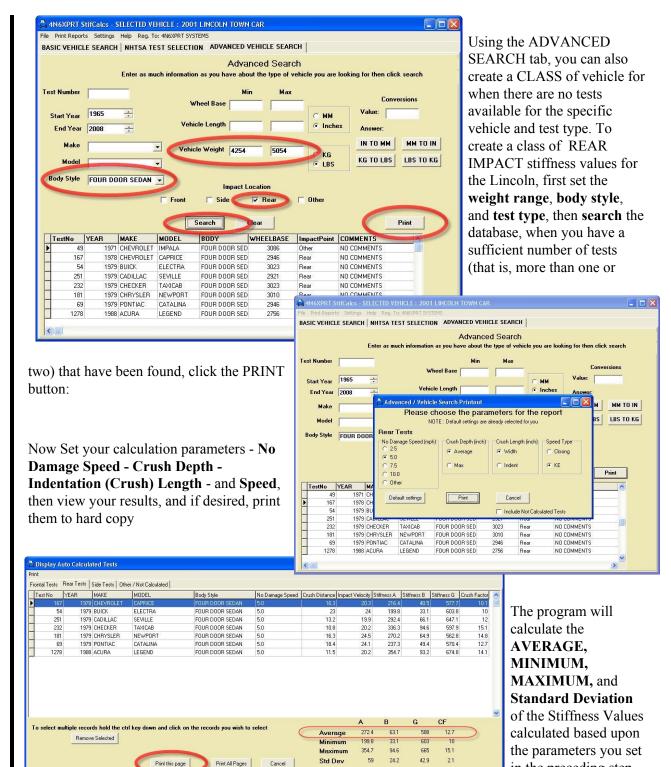
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| | | ; | SUB-TOTAL | \$ |
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| California shipping addresses add 9.50% sales (California orders delivered b | | t DO NOT owe so | les tar) | ۵ |
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Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

Dear Customer.

Due to the governments desire (both U.S. & California) to "protect us" we will need the following information from you in order to process your credit card(s). Please complete this form and return it with your order.

Card type: Am. Express / Visa / MasterCard Card Number: Expiration Date (MM/YY): MERCICAN EXPRES 1234 5678 9012 345 ←Visa/MasterCard American Express → Card ID

Security code (card ID) on back of Visa/MasterCard card or front of American Express Card:

Address for where the credit card bill is sent:

(This is the address number - for instance, ours would be 8387 University Avenue - that the credit card bill would go to, not where we would send the data or product to)

City/State/Zip for where the credit card bill is sent:

(- for instance, ours would be La Mesa, CA 91941 - that the credit card bill would go to, not where we would send the data or product to)

Authorized signature:

We appreciate your cooperation in supplying us with this information and understanding that it is being required of us to obtain the information.

Sincerely,

O'Umfaf DE

Daniel W. Vomhof III General Manager/Technical Support

SERVICE

You may make your request by phone or fax. Our fax machine is on 24 hours, 7 days a week, and can be reached at (619) 464-2206. A request may also be made by e-mail, which reaches us when we are "on the road" as well as in the office..

Upon receiving your request, we will research you request and **fax the information to you at NO ADDITIONAL CHARGE!** Normal response time is one working day or less. Your hard copy will follow in the mail.

Please include the vehicle information on the sample order form when requesting your Individual Vehicle Data Search. Please also be sure to provide a Visa, MasterCard, or American Express number, name as it appears on the card, Expiration date, and the billing address # and Zip.

*Pricing is for multiple vehicles on same Order/Request. Similar Vehicles may be required when it is not possible to determine the exact model of vehicle requested, based upon the information provided.

VIN DeCoding Information

FAX/Order Form

Expert VIN Decoder & Expert AutoStats
 NHTSA Crash Test Results
 BOTH

Please circle <u>ALL OPTIONS</u> that apply

YEAR & MAKE:

MODEL:

If you are requesting VIN DeCoder & AutoStats please also provide the following information:

| No. of Doors: | 2/3/4/5 |
|---------------|---------------------------------|
| Body Style: | Coupe/Conv./Sedan/Wagon |
| SUV & P/U: | 4x2 / 4x4 / Dual Rear Wheel |
| PICKUPS: | Std. / Extra / Super / Crew Cab |
| | Short Bed / Long Bed |
| VANS: | Cargo / Passenger |
| | Short / Long Wheelbase |
| | |

VIN Information

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | 9 |
|---|----|----|----|----|----|----|----|----|---|
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | - |

<u>NHTSA Crash Test Information</u> Impact location - Front / Side / Rear Impact Speed - Lower / Higher

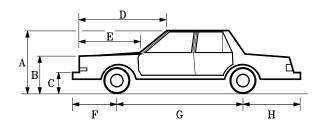
PAYMENT INFORMATION Visa/MasterCard / American Express:

Expires: ____ / ____

Name & Address:

Case Reference Name/Number:

Individual Vehicle Data Search Service[®]



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How often have you been confronted with the

following on a Traffic Collision Report - "87 Ford, 4 door, Blue"? We have the answer to the problem of determining WHICH Ford 4 door model this was!

We will DeCode the VIN number and provide you with the information contained within that VIN number

Information generally includes:

| Year | OEM Engine |
|---|--------------------|
| Make | Displacement/Type |
| Model | Rated Horsepower |
| Drive Wheels | Rated Torque |
| Rated Pass. Load | Iginition System |
| Plant of Manufacture | Fuel Line Pressure |
| Also (<i>when provided</i> Gross Vehicle Weight Transmission | • |

A DMV search for a vehicle identification from the registration will typically cost less than \$10.00 and will give the VIN number, Make, and Year of vehicle. However, to also obtain the vehicle Model requires a "Manual Search" which will typically cost \$30.00/vehicle/year searched.

With our service, you will be able to find out the model of vehicle as well as all of the other information mentioned above. This information will be faxed to you, typically in less than one working day, and the hard copy will follow in the mail.

Allow us to help you have all the information you require in your next Accident, Personal Injury, Criminal, Domestic, or Product Liability case.

Individual Vehicle Specifications

Now you can get the Expert AutoStats® data for the vehicles in your case *QUICKLY*, *EASILY*, and *ECONOMICALLY*, instead of guessing, or begging a printout from a friend.

Our vehicle database includes dimensions on over 35,000 Cars, Vans, Lt. Pickups, and Utility Vehicles covering 1945 to the present.

Minimum Vehicle specifications include:

| Overall Length | Curb Weight |
|--|-----------------------------------|
| Overall Width | Weight Distribution |
| Overall Height | Front/Rear Track |
| Wheelbase | CG Location |
| Model yeasr with No Signifi VIN DeCoding when VIN is pr | 6 |
| Mid-60's to present also ir | ncludes (<i>when available</i>) |
| Fron/Reart Overhang | Bumper Heights |
| Hood height | Turning Circle |
| Bumper-to-hood | Ground-to-hood |

Dimensions are given in both Imperial and metric (SI) units. Motorcycle specifications will be similar to the Vehicle specifications with appropriate changes where applicable.

While the VIN number contains much information, it does not contain everything needed to identify a particular vehicle in every situation. Therefore, we would appreciate you providing as much of the information on the order form as possible.

If you are not sure of the specific model, we will provide dimensions on the similar model vehicles matching the provided data for a small additional cost per model*.

Individual Vehicle Data Search Service[®] Charges & Services

Individual Vehicle Specifications

\$40.00-First vehicle*, \$35.00/Additional Vehicles*, \$20.00/Additional Similar Model*

<u>Medium/Heavy Truck</u> <u>Specifications</u>

\$40.00-First vehicle*, \$35.00/Additional Vehicles*, \$20.00/Additional Similar Model*

Motorcycle Specifications (1970+)

\$40.00-First cycle*, \$35.00/Additional cycles*, \$20.00/Additional Similar Model*

NHTSA Crash Test Results

\$40.00 per test - Includes A, B, & G values Calculations are based on the test results

NHTSA Crash Test Results

Test results include: General Test information, Barrier Data when provided, Vehicle Data as reported by the testing organization, Occupant (Dummy) data when provided, and A-B-G Stiffness calculations based on the test results.

You may make your request by phone or fax. Our fax machine is on 24 hours/day and can be reached at:

(619) 464-2206

Individual Vehicle Data Search Service[®] Charges & Services

You may make your request by phone or fax. Our fax machine is on 24 hours/day and can be reached at

(619) 464-2206

Individual Vehicle Specifications

\$40.00-First vehicle*, \$35.00/Additional Vehicles*, \$20.00/Additional Similar Model*

Medium/Heavy Truck Specifications

\$40.00-First vehicle*, \$35.00/Additional Vehicles*, \$20.00/Additional Similar Model*

Motorcycle Specifications (1970+)

\$40.00-First cycle*, \$35.00/Additional cycles*, \$20.00/Additional Similar Model*

NHTSA Crash Test Results

\$40.00 per test - Includes A, B, & G values Calculations are based on the test results

Contact Name & Address:

| Phone: (|) | |
|----------|---|--|
| Fax: (|) | |

| PAYMENT INFORMATION |
|-------------------------------------|
| Visa/MasterCard / American Express: |

| Expires: / | |
|--------------------------------------|--|
| Credit Card billing address and Zip: | |
| Address: | |
| Zip: | |
| Security Code # | |

FAX/Order Form

Expert VIN Decoder & Expert AutoStats
 NHTSA Crash Test Results
 BOTH

Please circle <u>ALL OPTIONS</u> that apply

YEAR & MAKE:

MODEL:

If you are requesting VIN DeCoder & AutoStats please also provide:

| No. of Doors: | 2/3/4/5 |
|---------------|---------------------------------|
| Body Style: | Coupe/Conv./Sedan/Wagon |
| SUV - P/U: | 4x2 / 4x4 / Dual Rear Wheel |
| PICKUPS: | Std. / Extra / Super / Crew Cab |
| | Short Bed / Long Bed |
| VANS: | Cargo / Passenger |
| | Short / Long Wheelbase |
| | |

VIN Information

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|----|----|----|----|----|----|----|----|
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |

NHTSA Crash Test Information

YEAR & MAKE:

MODEL:

Impact location - Front / Side / Rear Impact Speed - Lower / Higher

Case Reference/Number:_____

FAX/Order Form

Expert VIN Decoder & Expert AutoStats NHTSA Crash Test Results BOTH

Please circle <u>ALL OPTIONS</u> that apply

YEAR & MAKE:

| MODEL: | | | |
|--------|--|--|--|
| | | | |

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VIN Information

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|----|----|----|----|----|----|----|----|
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |

NHTSA Crash Test Information

YEAR & MAKE:

MODEL:

Impact location - Front / Side / Rear Impact Speed - Lower / Higher

Case Reference/Number:_____

Expert System Software for Litigation

8387 University Avenue La Mesa, CA 91942-9342 FED Tax ID No.: 95-3121248

Phone: 1-800-266-9778 Fax: (619) 464-2206

099

CID

9500F

Web Site: http://www.4n6xprt.com

E-Mail: 4n6@4n6xprt.com

Dear Customer.

Due to the governments desire (both U.S. & California) to "protect us" we will need the following information from you in order to process your credit card(s). Please complete this form and return it with your order.

Card type: Am. Express / Visa / MasterCard Card Number: Expiration Date (MM/YY): MERCICAN EXPRES 1234 5678 9012 345 ←Visa/MasterCard American Express → Card ID

Security code (card ID) on back of Visa/MasterCard card or front of American Express Card:

Address for where the credit card bill is sent:

(This is the address number - for instance, ours would be 8387 University Avenue - that the credit card bill would go to, not where we would send the data or product to)

City/State/Zip for where the credit card bill is sent:

(- for instance, ours would be La Mesa, CA 91941 - that the credit card bill would go to, not where we would send the data or product to)

Authorized signature:

We appreciate your cooperation in supplying us with this information and understanding that it is being required of us to obtain the information.

Sincerely,

O'Umfaf DE

Daniel W. Vomhof III General Manager/Technical Support

Expert System Software for Litigation

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The 2011 version of 4N6XPRT StifCalcs® contains a Force Balance module -

The Force Balance approach to Stiffness values is based on the concept of "Equal and Opposite Forces" in combination with the assumption that one of the vehicles involved has a good set of Stiffness values based on testing.

There are essentially only TWO requirements in order to use a Force Balance approach, and they are:

- U You must have A-B values for one of the vehicles for the surface that was hit
- Both vehicles must have SOME damage

Beyond these two requirements, the QUALITY of your calculation results will be impacted by :

- The quality of the information you have on each vehicle (weight, pass/cargo load, etc.)
- The quality/accuracy of your crush measurements
- The quality of your A-B stiffness values

while the Force Balance analysis CAN be run with degraded information in the above three areas, the quality of the results will also be degraded, sometimes significantly so.

As an extension of our Individual Vehicle Data Search Service, we have now added Force Balance Analysis runs to our services. An order form with pricing follows on the next page.

With respect to the Order Form -

- A) Please be SPECIFIC on the vehicle make and model, including drive wheels, bed length, etc.
- B) The Curb Weight used will come from Expert AutoStats unless you specify some other weight
- C) The PDOF Lever Arm default length is 0 inches
- D) The Angle of Collision Force to Normal Force default value is 0 degrees
- E) If no Crush Spacing is indicated, equal spacing will be used.

If you have any specific questions, please be sure to call.

Sincerely,

United I

Daniel W. Vomhof III General Manager/Technical Support

| 4N6XPRT | S | ystems |
|---------|---|--------|
| | | |

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| Vehicle 1 (KNOV | WN Stiffness) - Year/Make/Model | Vehicle 2 - Year/Make/Model | | | | | |
|--------------------------------------|--|---|---|--|--|--|--|
| Occupant + Cargo W | Veight (pounds) = Veight (pounds) = Veight (pounds) = | Curb Weight (pounds) = Occupant + Cargo Weight (pounds) = Total Weight (pounds) = | | | | | |
| Co | sion Force to Force Normal to Ilision Face (degrees) = rm Distance (inches) = | Collision Face (d | Angle of Collision Force to Force Normal to Collision Face (degrees) = PDOF Lever Arm Distance (inches) = | | | | |
|] | Damage Length (inches) = | Damage Ler | ngth (inches) = | | | | |
| | easurements are equally spaced, you do not e distance between Crush measurements. | t If Crush Depth measurements a need to fill in the distance bet | | | | | |
| <u>Crush I</u> | Depth <u>Crush Spacing</u> EQUAL?? Yes / No | | <u>Crush Spacing</u> EQUAL?? Yes / No | | | | |
| C1 (inches) = | | C1 (inches) = | e C1 to C2 (inches) = | | | | |
| C2 (inches) = | | C2 (inches) = | e C2 to C3 (inches) = | | | | |
| C3 (inches) = | Distance C3 to C4 (inches) = | C3 (inches) = Distance | e C3 to C4 (inches) = | | | | |
| C4 (inches) = | Distance C4 to C5 (inches) = | C4 (inches) = Distance | e C4 to C5 (inches) = | | | | |
| C5 (inches) = | Distance C5 to C6 (inches) = | C5 (inches) = | e C5 to C6 (inches) = | | | | |
| C6 (inches) = | Distance C6 to C7 (inches) = | C6 (inches) = Distance | e C6 to C7 (inches) = | | | | |
| C7 (inches) = | Distance C7 to C8 (inches) = | C7 (inches) = Distance | e C7 to C8 (inches) = | | | | |
| C8 (inches) = | Distance C8 to C9 (inches) = | C8 (inches) = Distance | e C8 to C9 (inches) = | | | | |
| C9 (inches) = | Distance C9 to C10 (inches) = $_$ | C9 (inches) = Distance | e C9 to C10 (inches) = | | | | |
| C10 (inches) = | | C10 (inches) = | | | | | |
| | | Visa/MasterCard/Amer | 1 | | | | |
| | | Card Number | | | | | |
| Company | | | 1 | | | | |
| Company Address | | Expiration | | | | | |
| Company Address City/State/Zip | | Security Code | <u></u> | | | | |

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