*** * * A T T E N T I O N * * ***

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 dependant 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.

Individual Vehicle Data Search Service (R)

Provided by:
4N6XPRT SYSTEMS (R)
Forensic Expert Software
La Mesa, CA 91942-9342

(619) 464-3478 / (800) 266-9778 / FAX: (619) 464-2206
http://www.4n6xprt.com

Through the use of

E X P E R T A U T O S T A T S (R)

DEVELOPED BY:
Daniel W. Vomhof III & Daniel W. Vomhof, Ph.D.

VEHICLE DATA RESEARCH BY:
Sheryl Cozby, Marion Vomhof, Muriel Vomhof, & Cindy Christensen

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN:	1G2WK52J21F258199
Model:	2001 Pontiac Grand Prix SE1 4 Door Sedan
Engine Size:	3.1L/ 191 cu.in.
Engine Description:	V6 cylinder with Overhead Valves (OHV)
Horse Power:	170 @ 5200 rpm
Torque:	190 lb-ft at 4000 rpm
Injection System:	Sequential Fuel Injection (SFI)
PSI:	41-47 psi
Ignition:	Electronic
Manufacturer:	Buick, Olsmobile, Cadillac
Assembly Plant:	Fairfax II, KS
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Manual Seatbelts + Driver & Passenger Air Bags

The First through Third characters (1G2) indicate a Pontiac Car made in the U.S.A.

The Fourth and Fifth characters (WK) indicate a Grand Prix SE1

The Sixth character (5) indicates a 4 Door Sedan

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

The Eighth character (J) indicates the OEM engine: 3.1L/ 191 cu.in., V6 OHV

The Ninth character (the check digit) is entered as 2.
The VIN appears Invalid, the calculated value is 7.

The Tenth character (1) indicates the model year 2001

The Eleventh character (F) indicates the vehicle was made in the assembly plant in Fairfax II, KS

The Twelfth through Seventeenth characters (258199) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

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

5/9/2012

2001 PONTIAC GRAND PRIX 4 DOOR SEDAN

Curb Weight:	3414	lbs.	1549	kg.
Curb Weight Distribution - Front:	65	% Rear:	35	%
Gross Vehicle Weight Rating:	4362	lbs.	1979	kg.
Number of Tires on Vehicle:	4			
Drive Wheels:	FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	197	16.42	5.00
Wheelbase:	111	9.25	2.82
Front Bumper to Front Axle:	42	3.50	1.07
Front Bumper to Front of Front Well:	26	2.17	0.66
Front Bumper to Front of Hood:	6	0.50	0.15
Front Bumper to Base of Windshield:	52	4.33	1.32
Front Bumper to Top of Windshield:	85	7.08	2.16
Rear Bumper to Rear Axle:	44	3.67	1.12
Rear Bumper to Rear of Rear Well:	31	2.58	0.79
Rear Bumper to Rear of Trunk:	6	0.50	0.15
Rear Bumper to Base of Rear Window:	28	2.33	0.71
Width Dimensions			
Maximum Width:	73	6.08	1.85
Front Track:	61	5.08	1.55
Rear Track:	61	5.08	1.55
Vertical Dimensions			
Height:	55	4.58	1.40
Ground to -			
Front Bumper (Top)	21	1.75	0.53
Headlight - center	25	2.08	0.64
Hood - top front:	26	2.17	0.66
Base of Windshield	36	3.00	0.91
Rear Bumper - top:	26	2.17	0.66
Trunk - top rear:	37	3.08	0.94
Base of Rear Window:	41	3.42	1.04

2001 PONTIAC GRAND PRIX 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	59	4.92	1.50
Front Seat to Headliner	38	3.17	0.97
Front Leg Room - seatback to floor (max)	43	3.58	1.09
Rear Seat Shoulder Width	57	4.75	1.45
Rear Seat to Headliner	37	3.08	0.94
Front Leg Room - seatback to floor (min)	30	2.50	0.76

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	480	40.00	12.19
Steering Ratio:	:1		
Wheel Radius:			
Tire Size (OEM):	P205/70R15		

Acceleration & Braking Information

Brake Type: ALL DISC
ABS System: ALL WHEEL ABS

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):
d = 139.0 ft t = 3.2 sec a = -27.8 ft/sec² G-force = -0.86

Acceleration:

0 to 30mph	t =	2.4	sec	a =	18.3	ft/sec²	G-force = 0.57
0 to 60mph	t =	6.9	sec	a =	12.8	ft/sec²	G-force = 0.40
45 to 65mph	t =	2.7	sec	a =	10.9	ft/sec²	G-force = 0.34

Transmission Type: 4spd AUTOMATIC

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 1997 - 2003

2001 PONTIAC GRAND PRIX 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	=	38.85
Inches in front of rear axle	=	72.15
Inches from side of vehicle	=	36.50
Inches from ground	=	21.59
Inches from front corner	=	88.71
Inches from rear corner	=	121.75
Inches from front bumper	=	80.85
Inches from rear bumper	=	116.15

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	2310.42	lb*ft*sec²
Pitch Moment of Inertia	=	2230.86	lb*ft*sec²
Roll Moment of Inertia	=	464.52	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	39.8	deg
Angle Front of Hood to Windshield Base	=	12.3	deg
Angle Front of Hood to Windshield Top	=	18.9	deg
Angle of Windshield	=	27.3	deg
Angle of Steering Tires at Max Turn	=	26.5	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:

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

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

Derived from

NHTSA Crash Test

#4775

2004 PONTIAC GRAND PRIX

Provided By

4N6XPRT StifCalcs®

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

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: **2001 PONTIAC GRAND PRIX**

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

Year Range	Make	Model	Body Styles	Wheelbase
2000 - 2005	CHEVROLET	IMPALA	2D, 4D, SW	110.5, 125
Remarks:				
1997 - 2004	BUICK	REGAL	2D, 4D, SW	107.5
Remarks: Regal now same as Century				
1997 - 2003	PONTIAC	GRAND PRIX	2D, 4D	110.5
Remarks:				
1998 - 2002	OLDSMOBILE	INTRIGUE	4D	109
Remarks:				
1997 - 2005	BUICK	CENTURY	2D, 4D, SW	109, 116
Remarks:				
2000 - 2005	CHEVROLET	MONTE CARLO	2D	108
Remarks:				
2004 - 2005	PONTIAC	GRAND PRIX	2D, 4D	110.5
Remarks:				

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 #	4775	NHTSA Test Reference Guide Version #	V5			
Test Date	2003-10-07	Contract #	DTNH22-01-D-02005			
Contract/Study Title	35 MPH NCAP FRONTAL - 2004 PONTIAC GRAND PRIX GT 4 DOOR SEDAN					
Test Objective(s)	OBTAIN ATD AND VEHICLE DATA					
Test Type	NEW CAR ASSESSMENT TEST	Configuration	VEHICLE INTO BARRIER			
Impact Angle	0	Side Impact Point	0	mm	0.0	inches
		Offset Distance	0	mm	0.0	inches
		Closing Speed	55.9	Km/Hr	34.73	MPH
Test Performer	KARCO ENGINEERING					
Test Reference #	M40100					
Test Track Surface	CONCRETE	Condition	DRY			
Ambient Temperature	29 C	84.2 F	Total Number of Curves	185		
Data Recorder Type	DIGITAL DATA ACQUISITION	Data Link	OTHER			
Test Commentary	DATALINK IS NONE, ON-BOARD DAS					

Fixed Barrier Information

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

2004 PONTIAC GRAND PRIX LEFT FRONT SEAT OCCUPANT

Test #	4775		
Vehicle #	1	Sex	MALE
Location	LEFT FRONT SEAT	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	HYBRID III		
Occupant Manufacturer	VECTOR, S/N:035		
Occupant Modification	UNMODIFIED		
Occupant Description	N0 COMMENTS		
Occupant Commentary	NO COMMENTS		

Head

Head to -

Windshielder Header	300	mm	11.8	inches	Head Injury Criteria (HIC)	596	
WindShield	590	mm	23.2	inches	HIC Lower Time Interval (ms)	61.8	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	96.1	
Side Header	235	mm	9.3	inches			
Side Window	335	mm	13.2	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	530	mm	20.9	inches	Arm to Door	30	mm	1.2	inches
Steering Wheel	285	mm	11.2	inches	Hip to Door	185	mm	7.3	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	58.5

Lap Belt Peak Load	3935	Newtons	884.6	pound Force
Shoulder Belt Peak Load	3763	Newtons	846.0	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	175	mm	6.9	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-6795	Newtons	-1527.6	pounds Force
Right Femur Peak Load	-6024	Newtons	-1354.3	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2004 PONTIAC GRAND PRIX LEFT FRONT SEAT OCCUPANT

Test #	4775					
Vehicle #	1	Sex	MALE			
Location	LEFT FRONT SEAT	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	HYBRID III
Occupant Manufacturer	VECTOR, S/N:035
Occupant Modification	UNMODIFIED
Occupant Description	N0 COMMENTS
Occupant Commentary	NO COMMENTS

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

2004 PONTIAC GRAND PRIX RIGHT FRONT SEAT OCCUPANT

Test #	4775		
Vehicle #	1	Sex	MALE
Location	RIGHT FRONT SEAT	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	HYBRID III		
Occupant Manufacturer	VECTOR, S/N:034		
Occupant Modification	UNMODIFIED		
Occupant Description	N0 COMMENTS		
Occupant Commentary	NO COMMENTS		

Head

Head to -

Windshielder Header	465	mm	18.3	inches	Head Injury Criteria (HIC)	509	
WindShield	785	mm	30.9	inches	HIC Lower Time Interval (ms)	61.9	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	97.8	
Side Header	290	mm	11.4	inches			
Side Window	355	mm	14.0	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	595	mm	23.4	inches	Arm to Door	50	mm	2.0	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	165	mm	6.5	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	43.7

Lap Belt Peak Load	3955	Newtons	889.1	pound Force
Shoulder Belt Peak Load	4090	Newtons	919.5	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	155	mm	6.1	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-5512	Newtons	-1239.2	pounds Force
Right Femur Peak Load	-3737	Newtons	-840.1	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2004 PONTIAC GRAND PRIX RIGHT FRONT SEAT OCCUPANT

Test #	4775					
Vehicle #	1	Sex	MALE			
Location	RIGHT FRONT SEAT	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	HYBRID III
Occupant Manufacturer	VECTOR, S/N:034
Occupant Modification	UNMODIFIED
Occupant Description	N0 COMMENTS
Occupant Commentary	NO COMMENTS

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - TOP
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

2004 PONTIAC GRAND PRIX RIGHT REAR SEAT OCCUPANT

Test #	4775		
Vehicle #	1	Sex	NOT APPLICABLE
Location	RIGHT REAR SEAT	Age	0
Position	NOT APPLICABLE	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	3 YEAR OLD CHILD		
Calibration Method	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY SAFETY SYSTEMS, S/N:139		
Occupant Modification	UNMODIFIED		
Occupant Description	N0 COMMENTS		
Occupant Commentary	CNTRH1:CHIN CONTACTED RETAINING CLIP		

Head

Head to -

Windshielder Header	0	mm	0.0	inches	Head Injury Criteria (HIC)	533	
WindShield	0	mm	0.0	inches	HIC Lower Time Interval (ms)	76.9	
Seatback	550	mm	21.7	inches	HIC Upper Time Interval (ms)	112.9	
Side Header	0	mm	0.0	inches			
Side Window	406	mm	16.0	inches			
Neck to Seatback	0	mm	0.0	inches			
First Contact Region (Head)	OTHER						
Second Contact Region (Head)							

Chest

Chest to -

Dash	0	mm	0.0	inches	Arm to Door	275	mm	10.8	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	330	mm	13.0	inches
Seatback	525	mm	20.7	inches					
Chest Severity Index	0				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	37.1			
Lap Belt Peak Load	0	Newtons	0.0	pound Force					
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force					
First Contact Region (Chest/Abdomen)	NONE								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	0	mm	0.0	inches	Knees to Seatback	374	mm	14.7	inches
Left Femur Peak Load	0	Newtons	0.0	pounds Force					
Right Femur Peak Load	0	Newtons	0.0	pounds Force					
First Contact Region (Legs)	NONE								
Second Contact Region (Legs)									

2004 PONTIAC GRAND PRIX RIGHT REAR SEAT OCCUPANT

Test #	4775					
Vehicle #	1	Sex	NOT APPLICABLE			
Location	RIGHT REAR SEAT	Age	0			
Position	NOT APPLICABLE	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	0.0	kg	0	pounds
Size	3 YEAR OLD CHILD					

Calibration Method	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY SAFETY SYSTEMS, S/N:139
Occupant Modification	UNMODIFIED
Occupant Description	N0 COMMENTS
Occupant Commentary	CNTRH1:CHIN CONTACTED RETAINING CLIP

Restraints

Restraint # 1	CONVERTIBLE CHILD SAFETY SEAT, FRONT FACING
Mounted	LATCH - LOWER ANCHORAGES AND TOP TETHER
Deployment	NOT APPLICABLE
Restraint Commentary	MANUFACTURER:EVENFLO, MODEL:VANGUARD 5, MODEL#
Restraint # 2	5 POINT BELT
Mounted	CHILD SEAT
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS

2004 PONTIAC GRAND PRIX LEFT REAR SEAT OCCUPANT

Test #	4775		
Vehicle #	1	Sex	NOT APPLICABLE
Location	LEFT REAR SEAT	Age	0
Position	NOT APPLICABLE	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	3 YEAR OLD CHILD		
Calibration Method	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY SAFETY SYSTEMS, S/N:082		
Occupant Modification	UNMODIFIED		
Occupant Description	N0 COMMENTS		
Occupant Commentary	CNTRH1, CHIN CONTACTED RETAINING CLIP		

Head

Head to -

Windshielder Header	0	mm	0.0	inches	Head Injury Criteria (HIC)	583	
WindShield	0	mm	0.0	inches	HIC Lower Time Interval (ms)	76.4	
Seatback	555	mm	21.9	inches	HIC Upper Time Interval (ms)	112.4	
Side Header	0	mm	0.0	inches			
Side Window	385	mm	15.2	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): OTHER

Second Contact Region (Head):

Chest

Chest to -

Dash	0	mm	0.0	inches	Arm to Door	250	mm	9.8	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	275	mm	10.8	inches
Seatback	500	mm	19.7	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	40.6

Lap Belt Peak Load 0 Newtons 0.0 pound Force

Shoulder Belt Peak Load 0 Newtons 0.0 pound Force

First Contact Region (Chest/Abdomen): NONE

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash 0 mm 0.0 inches Knees to Seatback 315 mm 12.4 inches

Left Femur Peak Load 0 Newtons 0.0 pounds Force

Right Femur Peak Load 0 Newtons 0.0 pounds Force

First Contact Region (Legs): NONE

Second Contact Region (Legs):

2004 PONTIAC GRAND PRIX LEFT REAR SEAT OCCUPANT

Test #	4775					
Vehicle #	1	Sex	NOT APPLICABLE			
Location	LEFT REAR SEAT	Age	0			
Position	NOT APPLICABLE	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	0.0	kg	0	pounds
Size	3 YEAR OLD CHILD					

Calibration Method	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY SAFETY SYSTEMS, S/N:082
Occupant Modification	UNMODIFIED
Occupant Description	N0 COMMENTS
Occupant Commentary	CNTRH1, CHIN CONTACTED RETAINING CLIP

Restraints

Restraint # 1	CONVERTIBLE CHILD SAFETY SEAT, FRONT FACING
Mounted	LATCH - LOWER ANCHORAGES AND TOP TETHER
Deployment	NOT APPLICABLE
Restraint Commentary	MANUFACTURER:CENTURY, MODEL:STE, MODEL#
Restraint # 2	5 POINT BELT
Mounted	CHILD SEAT
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS

Vehicle 1 2004 PONTIAC GRAND PRIX

Test #	4775		
VIN	2G2WP522941121660	NHTSA Test Vehicle Number	1
Year	2004	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	PONTIAC	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	GRAND PRIX	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.8 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	5034	mm	198.2	inches	CG behind Front Axle	1131	mm	44.5	inches
Vehicle Width	1800	mm	70.9	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2815	mm	110.8	inches	Total Length of Indentation	1383	mm	54.4	inches
Vehicle Test Weight	1789	KG	3943	pounds	Maximum Static Crush Depth	587	mm	23.1	inches
					Pre-Impact Speed	56	kph	34.7	mph

Vehicle Damage Index: 12FDEW6 — Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	-472	mm	-18.6	inches
DPD 2	-582	mm	-22.9	inches
DPD 3	-584	mm	-23.0	inches
DPD 4	-569	mm	-22.4	inches
DPD 5	-539	mm	-21.2	inches
DPD 6	-423	mm	-16.7	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	190.3	inches	171.7	inches	18.6	inches
	4834	mm	4362	mm	472	mm
Centerline	198.2	inches	175.2	inches	23.0	inches
	5034	mm	4450	mm	584	mm
Right Bumper Corner	190.2	inches	173.6	inches	16.7	inches
	4832	mm	4409	mm	423	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 2004 PONTIAC GRAND PRIX

Test #	4775		
VIN	2G2WP522941121660	NHTSA Test Vehicle Number	1
Year	2004	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	PONTIAC	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	GRAND PRIX	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.8 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	5034	mm	198.2	inches	CG behind Front Axle	1131	mm	44.5	inches
Vehicle Width	1800	mm	70.9	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2815	mm	110.8	inches	Total Length of Indentation	1383	mm	54.4	inches
Vehicle Test Weight	1789	KG	3943	pounds	Maximum Static Crush Depth	587	mm	23.1	inches
					Pre-Impact Speed	56	kph	34.7	mph

Vehicle Damage Index	12FDEW6	Principal Direction of Force	0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				5034	198.2	4450	175.2				
				Engine Block							
				420	16.5	420	16.5				
4834	190.3	4362	171.7	Front Bumper Corner				4832	190.2	4409	173.6
				Front of Engine							
				4400	173.2	4088	160.9				
3764	148.2	3699	145.6	Firewall				3759	148.0	3714	146.2
				3816	150.2	3763	148.1				
3414	134.4	3401	133.9	Upper Leading Edge of Door				3414	134.4	3405	134.1
3372	132.8	3360	132.3	Lower Leading Edge of Door				3371	132.7	3356	132.1
3371	132.7	3355	132.1	Bottom of 'A' Post				3359	132.2	3346	131.7
2315	91.1	2301	90.6	Upper Trailing Edge of Door				2314	91.1	2304	90.7
2329	91.7	2317	91.2	Lower Trailing Edge of Door				2322	91.4	2310	90.9
				Steering Column							
				2932	115.4	2940	115.7				
				Center of Seering Column to 'A' Post (Horizontal)							
				405	15.9	415	16.3				
				Center of Steering Column to Headliner (Vertical)							
				415	16.3	373	14.7				

2004 PONTIAC GRAND PRIX

NHTSA Crash Test - #4775 - Front Impact

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

Test Vehicle Weight = 3943 pounds
Vehicle Closing Speed = 34.7 mph
Test Crush Length = 70.9 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	18.6	23.0	16.7	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 16.7 inches					192.9
Using a Rated No Damage Speed of	2.5mph	215.2	166.1	139.4	
Using a Rated No Damage Speed of	5.0mph	397.0	141.4	557.6	
Using a Rated No Damage Speed of	7.5mph	545.5	118.6	1254.6	
Using a Rated No Damage Speed of	10.0mph	660.5	97.8	2230.4	
Average Crush = 20.3 inches					130.6
Using a Rated No Damage Speed of	2.5mph	177.0	112.4	139.4	
Using a Rated No Damage Speed of	5.0mph	326.6	95.7	557.6	
Using a Rated No Damage Speed of	7.5mph	448.7	80.3	1254.6	
Using a Rated No Damage Speed of	10.0mph	543.4	66.2	2230.4	
Maximum Crush = 23.0 inches					101.7
Using a Rated No Damage Speed of	2.5mph	156.3	87.6	139.4	
Using a Rated No Damage Speed of	5.0mph	288.3	74.5	557.6	
Using a Rated No Damage Speed of	7.5mph	396.1	62.5	1254.6	
Using a Rated No Damage Speed of	10.0mph	479.6	51.6	2230.4	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	23.0	34.7	0.0	0.1

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 21.0

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

2004 PONTIAC GRAND PRIX

NHTSA Crash Test - #4775 - Front Impact

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

Test Vehicle Weight = 3943 pounds
Vehicle Closing Speed = 34.7 mph
Test Crush Length = 54.4 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	18.6	23.0	16.7	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 16.7 inches					251.1
Using a Rated No Damage Speed of	2.5mph	280.1	216.2	181.4	
Using a Rated No Damage Speed of	5.0mph	516.7	184.0	725.7	
Using a Rated No Damage Speed of	7.5mph	709.9	154.3	1632.9	
Using a Rated No Damage Speed of	10.0mph	859.7	127.3	2902.8	
Average Crush = 20.3 inches					169.9
Using a Rated No Damage Speed of	2.5mph	230.4	146.3	181.4	
Using a Rated No Damage Speed of	5.0mph	425.1	124.5	725.7	
Using a Rated No Damage Speed of	7.5mph	584.0	104.4	1632.9	
Using a Rated No Damage Speed of	10.0mph	707.2	86.2	2902.8	
Maximum Crush = 23.0 inches					132.4
Using a Rated No Damage Speed of	2.5mph	203.4	114.0	181.4	
Using a Rated No Damage Speed of	5.0mph	375.2	97.0	725.7	
Using a Rated No Damage Speed of	7.5mph	515.5	81.4	1632.9	
Using a Rated No Damage Speed of	10.0mph	624.2	67.1	2902.8	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	23.0	34.7	0.0	0.1

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 21.0

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

2004 PONTIAC GRAND PRIX

NHTSA Crash Test - #4775 - Front Impact

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

Test Vehicle Weight = 3943 pounds
Vehicle Closing Speed = 34.7 MPH
Test Crush Length = 70.9 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	-18.6	-22.9	-23.0	-22.4	-21.2	-16.7	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 6.0 inches					1494.4
Using a Rated No Damage Speed of	2.5mph	599.0	1287.0	139.4	
Using a Rated No Damage Speed of	5.0mph	1105.1	1095.1	557.6	
Using a Rated No Damage Speed of	7.5mph	1518.2	918.6	1254.6	
Using a Rated No Damage Speed of	10.0mph	1838.4	757.7	2230.4	
Average Crush = 20.4 inches					129.3
Using a Rated No Damage Speed of	2.5mph	176.2	111.3	139.4	
Using a Rated No Damage Speed of	5.0mph	325.0	94.7	557.6	
Using a Rated No Damage Speed of	7.5mph	446.5	79.5	1254.6	
Using a Rated No Damage Speed of	10.0mph	540.7	65.5	1543.2	
Maximum Crush = 23.0 inches					101.7
Using a Rated No Damage Speed of	2.5mph	156.3	87.6	139.4	
Using a Rated No Damage Speed of	5.0mph	288.3	74.5	557.6	
Using a Rated No Damage Speed of	7.5mph	396.1	62.5	1254.6	
Using a Rated No Damage Speed of	10.0mph	479.6	51.6	2230.4	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	23.0	34.7	0.0	0.1

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 21.0

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

2004 PONTIAC GRAND PRIX

NHTSA Crash Test - #4775 - Front Impact

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

Test Vehicle Weight = 3943 pounds
Vehicle Closing Speed = 34.7 MPH
Test Crush Length = 54.4 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	-18.6	-22.9	-23.0	-22.4	-21.2	-16.7	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 6.0 inches					1945.0
Using a Rated No Damage Speed of	2.5mph	779.6	1675.1	181.4	
Using a Rated No Damage Speed of	5.0mph	1438.3	1425.3	725.7	
Using a Rated No Damage Speed of	7.5mph	1976.0	1195.6	1632.9	
Using a Rated No Damage Speed of	10.0mph	2392.8	986.2	2902.8	
Average Crush = 20.4 inches					168.3
Using a Rated No Damage Speed of	2.5mph	229.3	144.9	181.4	
Using a Rated No Damage Speed of	5.0mph	423.0	123.3	725.7	
Using a Rated No Damage Speed of	7.5mph	581.2	103.4	1632.9	
Using a Rated No Damage Speed of	10.0mph	703.8	85.3	2008.5	
Maximum Crush = 23.0 inches					132.4
Using a Rated No Damage Speed of	2.5mph	203.4	114.0	181.4	
Using a Rated No Damage Speed of	5.0mph	375.2	97.0	725.7	
Using a Rated No Damage Speed of	7.5mph	515.5	81.4	1632.9	
Using a Rated No Damage Speed of	10.0mph	624.2	67.1	2902.8	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	23.0	34.7	0.0	0.1

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 21.0

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: 1997 - 2003
Make: PONTIAC
Model: GRAND PRIX

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
4141	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	20.8	29.6	256.8	60.8	542.3	88.0	16.9
2831	1998 BUICK CENTURY FOUR DOOR SEDAN	5.0	19.7	29.9	268.6	67.9	531.3	97.9	18.1
3524	2001 CHEVROLET MONTE CARLO TWO DOOR C...	5.0	23.2	35.5	277.3	73.0	526.8	98.9	21.7
3471	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	23.2	34.9	279.0	71.9	541.0	98.0	21.0
3053	1999 BUICK CENTURY FOUR DOOR SEDAN	5.0	22.4	34.9	283.7	75.7	531.5	103.1	21.8
2821	1998 OLDSMOBILE INTRIGUE FOUR DOOR SEDAN	5.0	21.0	34.9	302.3	86.0	531.5	117.2	23.1
5204	2004 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	18.1	29.6	307.7	83.3	567.9	120.7	19.3
3843	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	16.9	29.8	321.5	94.3	548.3	136.2	21.0
4775	2004 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	20.4	34.7	325.6	95.1	557.6	129.7	23.7
4317	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	12.1	24.9	351.3	115.8	532.7	181.2	20.6
3637	2001 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	16.9	34.7	373.4	131.4	530.8	179.4	28.5
2855	1997 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	17.7	29.6	386.6	107.3	696.2	155.3	19.8
3786	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	12.9	30.0	413.5	160.1	534.0	230.8	27.8
2877	1997 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	9.2	25.2	465.2	205.0	527.9	318.8	27.7
3798	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	11.3	24.8	465.8	162.6	667.3	255.1	21.7
	Average (AVG)				**338.6**	**106.0**	**557.8**	**154.0**	**22.2**
	Minimum (MIN)				**256.8**	**60.8**	**526.8**	**88.0**	**16.9**
	Maximum (MAX)				**465.8**	**205.0**	**696.2**	**318.8**	**28.5**
	Standard Deviation (STDev-sample)				**68.7**	**41.8**	**51.9**	**67.8**	**3.5**
	Number of Tests (n)			**15**					

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 1997 - 2003
Make: PONTIAC
Model: GRAND PRIX

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
2877	1997 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	19.9	25.2	214.4	43.5	527.9	67.7	12.8
4141	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	24.7	29.6	216.5	43.2	542.3	62.5	14.2
3524	2001 CHEVROLET MONTE CARLO TWO DOOR C...	5.0	28.5	35.5	225.8	48.4	526.8	65.6	17.7
2831	1998 BUICK CENTURY FOUR DOOR SEDAN	5.0	23.2	29.9	227.7	48.8	531.3	70.4	15.4
3053	1999 BUICK CENTURY FOUR DOOR SEDAN	5.0	27.4	34.9	232.5	50.8	531.5	69.3	17.8
3471	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	27.1	34.9	238.5	52.6	541.0	71.6	18.0
2821	1998 OLDSMOBILE INTRIGUE FOUR DOOR SEDAN	5.0	24.1	34.9	263.4	65.3	531.5	89.0	20.2
3843	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	20.6	29.8	264.3	63.7	548.3	92.0	17.2
5204	2004 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	20.7	29.6	269.6	64.0	567.9	92.7	16.9
2888	1998 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	15.2	24.7	272.9	70.8	525.7	111.4	16.1
4775	2004 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	23.1	34.7	286.9	73.8	557.6	100.7	20.9
4317	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	13.5	24.9	313.4	92.2	532.7	144.3	18.3
3798	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	16.7	24.8	317.3	75.4	667.3	118.3	14.8
3637	2001 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	19.1	34.7	330.0	102.6	530.8	140.0	25.2
2855	1997 PONTIAC GRAND PRIX FOUR DOOR SEDAN	5.0	19.5	29.6	351.4	88.7	696.2	128.3	18.0
3786	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	14.2	30.0	374.9	131.6	534.0	189.7	25.2
3648	2001 CHEVROLET IMPALA FOUR DOOR SEDAN	5.0	17.6	35.0	452.2	154.1	663.6	209.8	27.8
	Average (AVG)				**285.4**	**74.7**	**562.1**	**107.3**	**18.6**
	Minimum (MIN)				**214.4**	**43.2**	**525.7**	**62.5**	**12.8**
	Maximum (MAX)				**452.2**	**154.1**	**696.2**	**209.8**	**27.8**
	Standard Deviation (STDev-sample)				**64.7**	**31.2**	**55.7**	**43.7**	**4.1**
	Number of Tests (n)			**17**					

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: 1FDKE30F3VHA25172

Model:	1997 Ford Econoline E350 4x2 RV Cutaway Van
Engine Size:	7.3 L / 445 cu.in.
Engine Description:	Turbocharged Diesel V-8 cylinder with Overhead Valves
Horse Power:	210 @ 3000 rpm
Torque:	425 lb-ft at 2000 rpm
Injection System:	Diesel
PSI:	N/A
Ignition:	N/A
Manufacturer:	Navistar
Assembly Plant:	Lorain, OH.
Drive Wheels:	This is a Rear Wheel Drive vehicle w/ Manual Belts

The First through Third characters (1FD) indicate a Ford Incomplete Vehicle made in the U.S.A.

The Fourth character (K) indicates a GVWR of 10001-14000 lbs.

The Fifth through Seventh characters (E30) indicate an Econoline E350 4x2 RV and a Cutaway Van

The Eighth character (F) indicates the OEM engine: 7.3 L / 445 cu.in., V8T Diesel, OHV

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

The Tenth character (V) indicates the model year 1997

The Eleventh character (H) indicates the vehicle was made in the assembly plant in Lorain, OH.

The Twelfth through Seventeenth characters (A25172) indicate the Serial Number and are unique to this vehicle.

EXPERT AUTOSTATS
Ver. 3.9

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

05-29-2012

1997 FORD E350 138WB DRW RV CUTAWAY DIESEL 2DR CUTAWAY VAN

CURB WEIGHT:	**6164 lbs.**	**2796 kg.**
Curb Weight Distribution -	**Front: 59 %**	**Rear: 41 %**
Gross Vehicle Weight Rating:	**10500 lbs.**	**4763 kg.**
Number of Tires on Vehicle:	**6**	
Drive Wheels:	**REAR**	

HORIZONTAL DIMENSIONS

	Inches	Feet	Meters
Total Length	**237**	**19.75**	**6.02**
Wheelbase:	**138**	**11.50**	**3.51**
Front Bumper to Front Axle	**30**	**2.50**	**0.76**
Front Bumper to Front of Front Well	**10**	**0.83**	**0.25**
Front Bumper to Front of Hood	**4**	**0.33**	**0.10**
Front Bumper to Base of Windshield	**33**	**2.75**	**0.84**
Front Bumper to Top of Windshield	**58**	**4.83**	**1.47**
Rear Bumper to Rear Axle	**69**	**5.75**	**1.75**
Rear Bumper to Rear of Rear Well	___	__.__	_.__
Rear Bumper to Rear of Trunk	___	__.__	_.__
Rear Bumper to Base of Rear Window	___	__.__	_.__

WIDTH DIMENSIONS

Maximum Width	**92**	**7.67**	**2.34**
Front Track	**69**	**5.75**	**1.75**
Rear Track	**73**	**6.08**	**1.85**

VERTICAL DIMENSIONS

	Inches	Feet	Meters
Height	**83**	**6.92**	**2.11**
Ground to:			
Front Bumper (Top)	**24**	**2.00**	**0.61**
Headlight - center	**34**	**2.83**	**0.86**
Hood - top front	**43**	**3.58**	**1.09**
Base of windshield	**51**	**4.25**	**1.30**
Rear Bumper - top	___	__.__	_.__
Trunk - top rear	___	__.__	_.__
Base of rear window	___	__.__	_.__

Reg. To: 4N6XPRT Systems **S/N:99R-930512AQ03201**

1997 FORD E350 138WB DRW RV CUTAWAY DIESEL 2DR CUTAWAY VAN

INTERIOR DIMENSIONS

	Inches	Feet	Meters
Front Seat Shoulder Width	___	__.__	_.__
Front Seat to Headliner	42	3.50	1.07
Front Leg - seatback to floor (max)	40	3.33	1.02
Rear Seat Shoulder Width	___	__.__	_.__
Rear Seat to Headliner	___	__.__	_.__
Rear Leg - seatback to floor (min)	___	__.__	_.__

Seatbelts: 3pt LAP & SHOULDER - front, None or Unknown - rear
Airbags: DRIVER SIDE AIRBAGS

STEERING DATA

Turning Circle (Diameter)	600	50.00	15.24
Steering Ratio:	17.00:1		
Wheel Radius:	14	1.17	0.36
Tire Size (OEM):	LT225/75R16		

ACCELERATION & BRAKING INFORMATION

Brake Type: FRONT DISC - REAR DRUM
ABS System: REAR ABS STANDARD, ALL WHEEL ABS OPTIONAL

Braking, 60 mph -> 0 (Hard pedal, no skid, dry pavement):
d = 190 ft t = 4.3 sec. a =-20.3 ft/sec/sec G-force = -0.63

ACCELERATION:

0->30 mph	t = 5.1 sec.	a = 8.6 ft/sec/sec	G-force = 0.27
0->60 mph	t = 14.6 sec.	a = 6.0 ft/sec/sec	G-force = 0.19
45->65 mph	t = 9.4 sec.	a = 3.1 ft/sec/sec	G-force = 0.10

Transmission Type: 4spd AUTOMATIC

NOTES:

Federal Bumper Standard Requirements = NO REQUIREMENT

1997 FORD E350 138WB DRW RV CUTAWAY DIESEL 2DR CUTAWAY VAN

OTHER INFORMATION

TIP-OVER STABILITY RATIO = 1.07 REASONABLY STABLE

CENTER OF GRAVITY (No Load):

Inches behind front axle	= 56.58
Inches in front of rear axle	= 81.42
Inches from side of vehicle	= 46.00
Inches from ground	= 33.20
Inches from front corner	= 98.04
Inches from rear corner	= 157.30
Inches from front bumper	= 86.58
Inches from rear bumper	= 150.42

MOMENTS OF INERTIA APPROXIMATIONS (No Load):

YAW MOMENT OF INERTIA	=	5142.92	lb-ft-sec^2
PITCH MOMENT OF INERTIA	=	4953.36	lb-ft-sec^2
ROLL MOMENT OF INERTIA	=	959.52	lb-ft-sec^2

FRONT PROFILE INFORMATION

ANGLE FRONT BUMPER TO HOOD FRONT	= 78.1	deg
ANGLE FRONT OF HOOD TO WINDSHIELD BASE	= 15.4	deg
ANGLE FRONT OF HOOD TO WINDSHIELD TOP	= 30.7	deg
ANGLE OF WINDSHIELD	= 52.0	deg
ANGLE OF STEERING TIRES AT MAX TURN	= 26.4	deg

FIRST APPROXIMATION CRUSH FACTORS:

Speed Equivalent (mph) of energy used in causing crush or indentation may be evaluated using the following formula and the appropriate Crush Factor (CF) and Maximum indentation depth, or MID, (in feet):

V(mph) = Sqr root of (30 * CF * MID)

Front Impact for a front engine vehicle	= 21
Front Impact for a Rear engine vehicle	= 27
Side Impact	= 27
Rear Impact for a front engine vehicle	= 27
Rear Impact for a rear engine vehicle	= 21

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

4N6XPRT Systems
Expert System Software for Litigation

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The NHTSA Crash Test database contains No Impact tests for the Ambulances.

A FORCE-BALANCE approach for calculating stiffness values for the side of the E350 van body was used, with the Stiffness Values from the range of tests for the Pontiac Grand Prix as the “Known Good” values.

Complications in this instance arise since the majority of the collision force ffrom the Pontiac was concentrated upon the corner of the Ambulance body, which sustained little to no crush deformation. To be conservative, we have used a No Damage Speed for the Van of 5 mph and the crsh profile to the van body only, which is in front of the Ambulance Body. Therefore, the Force-Balance results should be conservative.

2001 PONTIAC GRAND PRIX - Front Impact

Curb Weight (pounds):	3396
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	3396
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	14.85
Damage Length (inches):	46.0
Crush Profile Measurements:	3

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	2291.88

"Known" Stifness Values

	A	B
Average	285.4	74.7
Minimum	214.4	43.2
Maximum	452.2	154.1
Std. Devation	64.7	31.2

	Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches) 11.00	26.00	403.00	7.97	3211.00	14.26	5746.00
C2 (inches) 20.00	20.00	280.00	7.43	2080.00	28.57	8000.00
C3 (inches) 8.00						
C4 (inches)						
C5 (inches)						
C6 (inches)						
C7 (inches)						
C8 (inches)						
C9 (inches)						
C10 (inches)						

Average Crush (inches): 14.85

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	214.4	43.2	19684.00	33289.98	17.1	17.9	24.6
Avg - 2 Std. Deviations	156.0	12.3	7788.45	18094.47	12.6	13.8	18.9
Avg - 1 Std. Deviations	220.7	43.5	19931.35	33887.54	17.3	18.1	24.7
Average	285.4	74.7	32074.25	51270.43	21.3	21.7	29.7
Avg + 1 Std. Deviations	350.1	105.9	44217.15	68837.97	24.7	24.8	33.9
Avg + 2 Std. Deviations	414.8	137.1	56360.05	86464.10	27.6	27.6	37.7
Maximum	452.2	154.1	63025.75	96226.32	29.2	29.0	39.6

Damage Centroid Depth (x) (inches)	7.75	k^2	3129.27
Damage Centroid Depth (y) (inches)	20.13	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	683.00		

1997 FORD E350 AMBULANCE - Side Impact

Curb Weight (pounds):	9200
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	9200
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	3.09
Damage Length (inches):	32.0
Crush Profile Measurements:	4

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	8133.00

		Unequal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	1.00	8.00	24.00	1.72	41.33	4.89	117.33
C2 (inches)	5.00	6.00	30.00	2.50	75.00	9.00	270.00
C3 (inches)	5.00	18.00	45.00	1.67	75.00	42.00	1890.00
C4 (inches)	0.00						
C5 (inches)							
C6 (inches)							
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 3.09

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	846.4	124.2	19684.00	16654.07	7.4	6.6	12.9
Avg - 2 Std. Deviations	400.7	27.8	7788.45	11440.57	6.1	5.1	6.1
Avg - 1 Std. Deviations	854.5	126.6	19931.35	16758.83	7.4	6.7	13.0
Average	1214.5	255.7	32074.25	21787.18	8.4	8.0	18.5
Avg + 1 Std. Deviations	1522.2	401.7	44217.15	26654.20	9.3	9.2	23.2
Avg + 2 Std. Deviations	1795.5	558.9	56360.05	31414.65	10.1	10.2	27.4
Maximum	1934.4	648.8	63025.75	33993.71	10.5	10.7	29.5

Damage Centroid Depth (x) (inches)	1.93	k^2	4099.03
Damage Centroid Depth (y) (inches)	23.00	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	99.00		

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: 2A4RR5DG6BR500118

Model:	2011 Chrysler Town & Country Van
Engine Size:	3.6 L/ 220 cu.in.
Engine Description:	V6 cylinder with Double Overhead Cam
Horse Power:	283 @ 6350 rpm
Torque:	260 lb-ft at 4300rpm
Injection System:	Electronic Fuel Injection (EFI)
PSI:	N/A psi
Ignition:	Electronic
Manufacturer:	Chrysler
Assembly Plant:	Windsor, ONT
Drive Wheels:	This is a Front Wheel Drive vehicle

The First through Third characters (2A4) indicate a Chrysler MPV made in Canada

The Fourth character (R) indicates a GVWR of 6001-7000 lbs.

The Fifth through Seventh characters (R5D) indicate a Town & Country

The Eighth character (G) indicates the OEM engine: 3.6 L/ 220 cu.in., V6, DOHC

The Ninth character (the check digit) is entered as 6.
The VIN appears Valid, the calculated value is 6.

The Tenth character (B) indicates the model year 2011

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

The Twelfth through Seventeenth characters (500118) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

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

5/9/2012

2011 CHRYSLER TOWN & COUNTRY 4 DOOR PASSENGER VAN

Curb Weight:		4652	lbs.	2110	kg.
Curb Weight Distribution -	Front:	56	% Rear:	44	%
Gross Vehicle Weight Rating:		6050	lbs.	2744	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	203	16.92	5.16
Wheelbase:	121	10.08	3.07
Front Bumper to Front Axle:	38	3.17	0.97
Front Bumper to Front of Front Well:	22	1.83	0.56
Front Bumper to Front of Hood:	7	0.58	0.18
Front Bumper to Base of Windshield:	41	3.42	1.04
Front Bumper to Top of Windshield:	75	6.25	1.91
Rear Bumper to Rear Axle:	44	3.67	1.12
Rear Bumper to Rear of Rear Well:	30	2.50	0.76
Rear Bumper to Rear of Trunk:	5	0.42	0.13
Rear Bumper to Base of Rear Window:	8	0.67	0.20
Width Dimensions			
Maximum Width:	79	6.58	2.01
Front Track:	66	5.50	1.68
Rear Track:	65	5.42	1.65
Vertical Dimensions			
Height:	68	5.67	1.73
Ground to -			
Front Bumper (Top)	24	2.00	0.61
Headlight - center	33	2.75	0.84
Hood - top front:	38	3.17	0.97
Base of Windshield	45	3.75	1.14
Rear Bumper - top:	21	1.75	0.53
Trunk - top rear:	41	3.42	1.04
Base of Rear Window:	47	3.92	1.19

2011 CHRYSLER TOWN & COUNTRY 4 DOOR PASSENGER VAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	64	5.33	1.63
Front Seat to Headliner	40	3.33	1.02
Front Leg Room - seatback to floor (max)	41	3.42	1.04
Rear Seat Shoulder Width	64	5.33	1.63
Rear Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (min)	36	3.00	0.91

Seatbelts: 3pt - front and rear

Airbags: FRONT SEAT AIRBAGS + SIDE AIRBAGS

Steering Data			
Turning Circle (Diameter)	468	39.00	11.89
Steering Ratio:	:1		
Wheel Radius:			
Tire Size (OEM):	235/60R16		

Acceleration & Braking Information

Brake Type: ALL DISC

ABS System: ALL WHEEL ABS

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):

d = 141.0 ft t = 3.2 sec a = -27.4 ft/sec² G-force = -0.85

Acceleration:

0 to 30mph	t =	2.9	sec	a =	15.2	ft/sec²	G-force = 0.47
0 to 60mph	t =	7.6	sec	a =	11.6	ft/sec²	G-force = 0.36
45 to 65mph	t =	4.9	sec	a =	6.0	ft/sec²	G-force = 0.19

Transmission Type: AUTOMATIC

Notes:

Federal Bumper Standard Requirements: No Requirement

N.S.D.C = 2011 - 2012

2011 CHRYSLER TOWN & COUNTRY 4 DOOR PASSENGER VAN

Other Information

Tip-Over Stability Ratio =	1.23	Reasonably Stable
NHTSA Star Rating (calculated)		***

Center of Gravity (No Load):

Inches behind front axle	=	53.24
Inches in front of rear axle	=	67.76
Inches from side of vehicle	=	39.50
Inches from ground	=	26.62
Inches from front corner	=	99.42
Inches from rear corner	=	118.54
Inches from front bumper	=	91.24
Inches from rear bumper	=	111.76

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	3448.56	lb*ft*sec²
Pitch Moment of Inertia	=	3553.24	lb*ft*sec²
Roll Moment of Inertia	=	788.44	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	63.4	deg
Angle Front of Hood to Windshield Base	=	11.6	deg
Angle Front of Hood to Windshield Top	=	22.4	deg
Angle of Windshield	=	31.7	deg
Angle of Steering Tires at Max Turn	=	29.6	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 (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

Derived from

NHTSA Crash Test

#7068

2009 VOLKSWAGEN ROUTAN

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: **2011 CHRYSLER TOWN & COUNTRY**

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

Year Range	Make	Model	Body Styles	Wheelbase
2008 - 2011	CHRYSLER	TOWN & COUNTRY	SW, VAN	121.2, 119.3
Remarks:				
2008 - 2011	DODGE	GRAND CARAVAN		121.2
Remarks:				
2009 - 2011	VOLKSWAGEN	ROUTAN		121.2
Remarks:				

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 #	7068	NHTSA Test Reference Guide Version #	V5			
Test Date	2009-05-27	Contract #	DTNH22-08-D-00086			
Contract/Study Title	FMVSS 208 FRONTAL IMPACT - 2009 VOLKSWAGEN ROUTAN					
Test Objective(s)	VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT PERFORMANCE DATA					
Test Type	FMVSS 208 OCCUPANT CRASH PROTECTION	Configuration	VEHICLE INTO BARRIER			
Impact Angle	0	Side Impact Point	0	mm	0.0	inches
		Offset Distance	0	mm	0.0	inches
		Closing Speed	55.8	Km/Hr	34.67	MPH
Test Performer	MGA RESEARCH					
Test Reference #	BT09052701					
Test Track Surface	CONCRETE	Condition	DRY			
Ambient Temperature	21 C	69.8 F	Total Number of Curves	38		
Data Recorder Type	OTHER	Data Link	OTHER			
Test Commentary	DTS TDAS PRO					

Fixed Barrier Information

Barrier Type	RIGID	Pole Barrier Diameter	0	mm	0 inches
Barrier Shape	FLAT BARRIER				
Barrier Commentary					

2009 VOLKSWAGEN ROUTAN LEFT FRONT SEAT OCCUPANT

Test #	7068		
Vehicle #	1	Sex	FEMALE
Location	LEFT FRONT SEAT	Age	0
Position	FORWARD OF CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	5 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 516		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO HEADREST		

Head

Head to -

Windshielder Header	383	mm	15.1	inches	Head Injury Criteria (HIC)	279	
WindShield	712	mm	28.0	inches	HIC Lower Time Interval (ms)	69.1	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	84.1	
Side Header	306	mm	12.0	inches			
Side Window	411	mm	16.2	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	597	mm	23.5	inches	Arm to Door	181	mm	7.1	inches
Steering Wheel	244	mm	9.6	inches	Hip to Door	153	mm	6.0	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	47

Lap Belt Peak Load 0 Newtons 0.0 pound Force

Shoulder Belt Peak Load 0 Newtons 0.0 pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash 89 mm 3.5 inches Knees to Seatback 0 mm 0.0 inches

Left Femur Peak Load -2194 Newtons -493.2 pounds Force

Right Femur Peak Load -1955 Newtons -439.5 pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2009 VOLKSWAGEN ROUTAN LEFT FRONT SEAT OCCUPANT

Test #	7068					
Vehicle #	1	Sex	FEMALE			
Location	LEFT FRONT SEAT	Age	0			
Position	FORWARD OF CENTER POSITION	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	0.0	kg	0	pounds
Size	5 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N 516
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	PRIMARY
Restraint # 2	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

2009 VOLKSWAGEN ROUTAN RIGHT FRONT SEAT OCCUPANT

Test #	7068		
Vehicle #	1	Sex	FEMALE
Location	RIGHT FRONT SEAT	Age	0
Position	FORWARD OF CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	5 PERCENTILE		
Calibration Method	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 511		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO HEADREST		

Head

Head to -

Windshielder Header	372	mm	14.6	inches	Head Injury Criteria (HIC)	402	
WindShield	748	mm	29.4	inches	HIC Lower Time Interval (ms)	70.4	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	85.4	
Side Header	298	mm	11.7	inches			
Side Window	409	mm	16.1	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	377	mm	14.8	inches	Arm to Door	182	mm	7.2	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	168	mm	6.6	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	43

Lap Belt Peak Load	0	Newtons	0.0	pound Force
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	61	mm	2.4	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-2984	Newtons	-670.8	pounds Force
Right Femur Peak Load	-2781	Newtons	-625.2	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2009 VOLKSWAGEN ROUTAN RIGHT FRONT SEAT OCCUPANT

Test #	7068					
Vehicle #	1	Sex	FEMALE			
Location	RIGHT FRONT SEAT	Age	0			
Position	FORWARD OF CENTER POSITION	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	0.0	kg	0	pounds
Size	5 PERCENTILE					

Calibration Method	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N 511
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	PRIMARY
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - TOP
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

Vehicle 1 2009 VOLKSWAGEN ROUTAN

Test #	7068		
VIN	2V8HW44199R543656	NHTSA Test Vehicle Number	1
Year	2009	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	VOLKSWAGEN	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	ROUTAN	Steering Column Collapse Mechanism	UNKNOWN
Body	OTHER		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.8 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary	ROUTAN MPV		

Vehicle Length	5127	mm	201.9	inches	CG behind Front Axle	1393	mm	54.8	inches
Vehicle Width	2000	mm	78.7	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	3081	mm	121.3	inches	Total Length of Indentation	1140	mm	44.9	inches
Vehicle Test Weight	2116	KG	4664	pounds	Maximum Static Crush Depth	445	mm	17.5	inches
					Pre-Impact Speed	56	kph	34.7	mph

Vehicle Damage Index: 12FDEW6

Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	321	mm	12.6	inches
DPD 2	387	mm	15.2	inches
DPD 3	440	mm	17.3	inches
DPD 4	445	mm	17.5	inches
DPD 5	328	mm	12.9	inches
DPD 6	269	mm	10.6	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	197.7	inches	185.1	inches	12.6	inches
	5022	mm	4701	mm	321	mm
Centerline	201.9	inches	184.9	inches	17.0	inches
	5127	mm	4696	mm	431	mm
Right Bumper Corner	197.7	inches	187.1	inches	10.6	inches
	5021	mm	4752	mm	269	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NO DIRECT ENGAGEMENT	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	0.0	NO DIRECT ENGAGEMENT
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 2009 VOLKSWAGEN ROUTAN

Test #	7068		
VIN	2V8HW44199R543656	NHTSA Test Vehicle Number	1
Year	2009	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	VOLKSWAGEN	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	ROUTAN	Steering Column Collapse Mechanism	UNKNOWN
Body	OTHER		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.8 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary	ROUTAN MPV		

Vehicle Length	5127	mm	201.9	inches	CG behind Front Axle	1393	mm	54.8	inches
Vehicle Width	2000	mm	78.7	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	3081	mm	121.3	inches	Total Length of Indentation	1140	mm	44.9	inches
Vehicle Test Weight	2116	KG	4664	pounds	Maximum Static Crush Depth	445	mm	17.5	inches
					Pre-Impact Speed	56	kph	34.7	mph

Vehicle Damage Index	12FDEW6	Principal Direction of Force	0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				5127	201.9	4696	184.9				
				Engine Block							
				0	0.0	0	0.0				
5022	197.7	4701	185.1	Front Bumper Corner				5021	197.7	4752	187.1
				Front of Engine							
				0	0.0	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	0.0	Upper Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Bottom of 'A' Post				0	0.0	0	0.0
0	0.0	0	0.0	Upper Trailing Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Trailing Edge of Door				0	0.0	0	0.0
				Steering Column							
				0	0.0	0	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				0	0.0	0	0.0				
				Center of Steering Column to Headliner (Vertical)							
				0	0.0	0	0.0				

2009 VOLKSWAGEN ROUTAN

NHTSA Crash Test - #7068 - Front Impact

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

Test Vehicle Weight = 4664 pounds
Vehicle Closing Speed = 34.7 mph
Test Crush Length = 78.7 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	12.6	17.0	10.6	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 10.6 inches					508.1
Using a Rated No Damage Speed of	2.5mph	360.3	437.4	148.4	
Using a Rated No Damage Speed of	5.0mph	664.6	372.1	593.6	
Using a Rated No Damage Speed of	7.5mph	912.9	312.0	1335.5	
Using a Rated No Damage Speed of	10.0mph	1105.2	257.3	2374.2	
Average Crush = 14.3 inches					279.2
Using a Rated No Damage Speed of	2.5mph	267.1	240.4	148.4	
Using a Rated No Damage Speed of	5.0mph	492.7	204.5	593.6	
Using a Rated No Damage Speed of	7.5mph	676.7	171.5	1335.5	
Using a Rated No Damage Speed of	10.0mph	819.3	141.4	2374.2	
Maximum Crush = 17.0 inches					197.5
Using a Rated No Damage Speed of	2.5mph	224.7	170.1	148.4	
Using a Rated No Damage Speed of	5.0mph	414.4	144.7	593.6	
Using a Rated No Damage Speed of	7.5mph	569.2	121.3	1335.5	
Using a Rated No Damage Speed of	10.0mph	689.2	100.0	2374.2	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	17.0	29.9	-4.8	-16.1

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 28.3

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

2009 VOLKSWAGEN ROUTAN

NHTSA Crash Test - #7068 - Front Impact

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

Test Vehicle Weight = 4664 pounds
Vehicle Closing Speed = 34.7 mph
Test Crush Length = 44.9 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	12.6	17.0	10.6	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 10.6 inches					891.3
Using a Rated No Damage Speed of	2.5mph	632.1	767.4	260.3	
Using a Rated No Damage Speed of	5.0mph	1166.0	652.8	1041.3	
Using a Rated No Damage Speed of	7.5mph	1601.6	547.4	2343.0	
Using a Rated No Damage Speed of	10.0mph	1939.0	451.3	4165.3	
Average Crush = 14.3 inches					489.8
Using a Rated No Damage Speed of	2.5mph	468.6	421.7	260.3	
Using a Rated No Damage Speed of	5.0mph	864.3	358.7	1041.3	
Using a Rated No Damage Speed of	7.5mph	1187.2	300.8	2343.0	
Using a Rated No Damage Speed of	10.0mph	1437.3	248.0	4165.3	
Maximum Crush = 17.0 inches					346.5
Using a Rated No Damage Speed of	2.5mph	394.1	298.4	260.3	
Using a Rated No Damage Speed of	5.0mph	727.0	253.8	1041.3	
Using a Rated No Damage Speed of	7.5mph	998.7	212.8	2343.0	
Using a Rated No Damage Speed of	10.0mph	1209.0	175.5	4165.3	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	17.0	29.9	-4.8	-16.1

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 28.3

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

2009 VOLKSWAGEN ROUTAN

NHTSA Crash Test - #7068 - Front Impact

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

Test Vehicle Weight = 4664 pounds
Vehicle Closing Speed = 34.7 MPH
Test Crush Length = 78.7 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	12.6	15.2	17.3	17.5	12.9	10.6	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 10.6 inches					508.1
Using a Rated No Damage Speed of	2.5mph	360.3	437.4	148.4	
Using a Rated No Damage Speed of	5.0mph	664.6	372.1	593.6	
Using a Rated No Damage Speed of	7.5mph	912.9	312.0	1335.5	
Using a Rated No Damage Speed of	10.0mph	1105.2	257.3	2374.2	
Average Crush = 14.9 inches					257.1
Using a Rated No Damage Speed of	2.5mph	256.3	221.4	148.4	
Using a Rated No Damage Speed of	5.0mph	472.8	188.3	593.6	
Using a Rated No Damage Speed of	7.5mph	649.5	157.9	1335.5	
Using a Rated No Damage Speed of	10.0mph	786.3	130.2	1641.5	
Maximum Crush = 17.5 inches					186.4
Using a Rated No Damage Speed of	2.5mph	218.2	160.5	148.4	
Using a Rated No Damage Speed of	5.0mph	402.6	136.5	593.6	
Using a Rated No Damage Speed of	7.5mph	553.0	114.5	1335.5	
Using a Rated No Damage Speed of	10.0mph	669.5	94.4	2374.2	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	17.5	30.3	-4.4	-14.4

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 27.5

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

2009 VOLKSWAGEN ROUTAN

NHTSA Crash Test - #7068 - Front Impact

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

Test Vehicle Weight = 4664 pounds
Vehicle Closing Speed = 34.7 MPH
Test Crush Length = 44.9 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	12.6	15.2	17.3	17.5	12.9	10.6	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 10.6 inches					891.3
Using a Rated No Damage Speed of	2.5mph	632.1	767.4	260.3	
Using a Rated No Damage Speed of	5.0mph	1166.0	652.8	1041.3	
Using a Rated No Damage Speed of	7.5mph	1601.6	547.4	2343.0	
Using a Rated No Damage Speed of	10.0mph	1939.0	451.3	4165.3	
Average Crush = 14.9 inches					451.1
Using a Rated No Damage Speed of	2.5mph	449.7	388.4	260.3	
Using a Rated No Damage Speed of	5.0mph	829.5	330.4	1041.3	
Using a Rated No Damage Speed of	7.5mph	1139.4	277.1	2343.0	
Using a Rated No Damage Speed of	10.0mph	1379.4	228.4	2879.8	
Maximum Crush = 17.5 inches					327.0
Using a Rated No Damage Speed of	2.5mph	382.9	281.6	260.3	
Using a Rated No Damage Speed of	5.0mph	706.3	239.5	1041.3	
Using a Rated No Damage Speed of	7.5mph	970.1	200.8	2343.0	
Using a Rated No Damage Speed of	10.0mph	1174.5	165.6	4165.3	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	17.5	30.3	-4.4	-14.4

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 27.5

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

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2008 - 2011
Make: CHRYSLER
Model: TOWN & COUNTRY

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
6172	2008 DODGE GRAND CARAVAN MINIVAN	5.0	22.2	35.0	340.3	91.9	630.0	125.1	22.0
6528	2008 DODGE GRAND CARAVAN OTHER	5.0	10.2	24.7	471.2	182.1	609.4	286.1	24.0
7068	2009 VOLKSWAGEN ROUTAN OTHER	5.0	14.9	34.7	472.1	187.8	593.6	256.4	32.2
	Average (AVG)				**427.9**	**153.9**	**611.0**	**222.5**	**26.1**
	Minimum (MIN)				**340.3**	**91.9**	**593.6**	**125.1**	**22.0**
	Maximum (MAX)				**472.1**	**187.8**	**630.0**	**286.1**	**32.2**
	Standard Deviation (STDev-sample)				**75.8**	**53.8**	**18.3**	**85.7**	**5.4**
	Number of Tests (n)			**3**					

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2008 - 2011
Make: CHRYSLER
Model: TOWN & COUNTRY

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
6172	2008 DODGE GRAND CARAVAN MINIVAN	5.0	24.2	35.0	312.1	77.3	630.0	105.2	20.2
7068	2009 VOLKSWAGEN ROUTAN OTHER	5.0	17.5	34.7	402.1	136.2	593.6	186.0	27.4
6528	2008 DODGE GRAND CARAVAN OTHER	5.0	11.9	24.7	404.5	134.3	609.4	210.9	20.6
	Average (AVG)				**372.9**	**115.9**	**611.0**	**167.4**	**22.7**
	Minimum (MIN)				**312.1**	**77.3**	**593.6**	**105.2**	**20.2**
	Maximum (MAX)				**404.5**	**136.2**	**630.0**	**210.9**	**27.4**
	Standard Deviation (STDev-sample)				**52.7**	**33.5**	**18.3**	**55.3**	**4.0**
	Number of Tests (n)			**3**					

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: KNJLT05H4R6107577

Model:	1994 Ford (Made by Kia) Aspire 2 door Hatchback
Engine Size:	1.3 L/ 81 cu.in.
Engine Description:	Inline 4 cylinder
Horse Power:	63 @ 5000 rpm
Torque:	73 lb-ft at 3000 rpm
Injection System:	Sequential Fuel Injection
PSI:	30-38 psi
Ignition:	electronic
Manufacturer:	Kia Motors
Assembly Plant:	Mazda-Kia, Korea
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Manual Seatbelts + Driver/Passgr Air Bag

The First through Third characters (KNJ) indicate a Ford (Made by Kia) Passenger car made in Korea

The Fourth character (L) indicates Manual Seatbelts + Driver/Passgr Air Bag

The Fifth through Seventh characters (T05) indicate an Aspire and a 2 door Hatchback

The Eighth character (H) indicates the OEM engine: L4, 1.3 L/ 81 cu.in., SFI

The Ninth character (the check digit) is entered as 4.
The VIN appears Valid, the calculated value is 4.

The Tenth character (R) indicates the model year 1994

The Eleventh character (6) indicates the vehicle was made in the assembly plant in Mazda-Kia, Korea

The Twelfth through Seventeenth characters (107577) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

PROVIDED BY:

4N6XPRT Systems

8387 University Avenue

La Mesa CA 91942

5/9/2012

1994 FORD ASPIRE 2 DOOR HATCHBACK

Curb Weight:	2135	lbs.	968	kg.
Curb Weight Distribution - Front:	62	% Rear:	38	%
Gross Vehicle Weight Rating:		lbs.		kg.
Number of Tires on Vehicle:	4			
Drive Wheels:	FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	156	13.00	3.96
Wheelbase:	94	7.83	2.39
Front Bumper to Front Axle:	34	2.83	0.86
Front Bumper to Front of Front Well:	20	1.67	0.51
Front Bumper to Front of Hood:	4	0.33	0.10
Front Bumper to Base of Windshield:	43	3.58	1.09
Front Bumper to Top of Windshield:	67	5.58	1.70
Rear Bumper to Rear Axle:	28	2.33	0.71
Rear Bumper to Rear of Rear Well:	15	1.25	0.38
Rear Bumper to Rear of Trunk:	4	0.33	0.10
Rear Bumper to Base of Rear Window:	6	0.50	0.15
Width Dimensions			
Maximum Width:	66	5.50	1.68
Front Track:	56	4.67	1.42
Rear Track:	55	4.58	1.40
Vertical Dimensions			
Height:	56	4.67	1.42
Ground to -			
Front Bumper (Top)	21	1.75	0.53
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:	25	2.08	0.64
Trunk - top rear:	33	2.75	0.84
Base of Rear Window:	43	3.58	1.09

1994 FORD ASPIRE 2 DOOR HATCHBACK

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	50	4.17	1.27
Front Seat to Headliner	38	3.17	0.97
Front Leg Room - seatback to floor (max)	42	3.50	1.07
Rear Seat Shoulder Width	50	4.17	1.27
Rear Seat to Headliner	36	3.00	0.91
Front Leg Room - seatback to floor (min)	34	2.83	0.86

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	396	33.00	10.06
Steering Ratio: 22.00:1			
Wheel Radius:	11	0.92	0.28
Tire Size (OEM): 165-70R13			

Acceleration & Braking Information

Brake Type: FRONT DISC - REAR DRUM
ABS System: ABS UNKNOWN

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):
d = 148.0 ft t = 3.4 sec a = -26.1 ft/sec² G-force = -0.81

Acceleration:

0 to 30mph	t =	3.5	sec	a =	12.6	ft/sec²	G-force = 0.39
0 to 60mph	t =	12.7	sec	a =	6.9	ft/sec²	G-force = 0.22
45 to 65mph	t =	8.6	sec	a =	3.4	ft/sec²	G-force = 0.11

Transmission Type: 5spd MANUAL

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 5 mph

N.S.D.C = 1994 - 1994

1994 FORD ASPIRE 2 DOOR HATCHBACK

Other Information

Tip-Over Stability Ratio =	1.30	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	35.72
Inches in front of rear axle	=	58.28
Inches from side of vehicle	=	33.00
Inches from ground	=	21.45
Inches from front corner	=	77.14
Inches from rear corner	=	92.38
Inches from front bumper	=	69.72
Inches from rear bumper	=	86.28

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	993.05	lb*ft*sec²
Pitch Moment of Inertia	=	964.65	lb*ft*sec²
Roll Moment of Inertia	=	234.30	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	63.4	deg
Angle Front of Hood to Windshield Base	=	10.2	deg
Angle Front of Hood to Windshield Top	=	21.6	deg
Angle of Windshield	=	36.9	deg
Angle of Steering Tires at Max Turn	=	27.2	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 (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).

Available Tests in the NHTSA database for a 1994 - 1997 FORD ASPIRE

Sister Clone Searched Year Range (1994 - 1997)

Print

Frontal Test(s)

Test No.	Year	Make	Model	Impact Speed	Max Crush	Crush Factor	VDI	PDOF	Test Config	VIN
2123	1994	FORD	ASPIRE	29.7	18.2	19.4	12FDEW2	180	VEHICLE INTO...	KNJLT05H9R610...
2129	1995	FORD	ASPIRE	35.3	23.9	20.8	12FDEW3	180	VEHICLE INTO...	KNJLT06H6R613...

Rear Test(s)

No Rear Tests: 1994 - 1997

Print

Side Test(s)

Test No.	Year	Make	Model	Impact Speed	Max Crush	Crush Factor	VDI	PDOF	Test Config	VIN
2500	1997	FORD	ASPIRE	33.0	1.2	368.7	03RPEW7	63	IMPACTOR IN...	KNJLT05HXV62...

Other Test(s)

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

The NHTSA Crash Test database contains NO REAR Impact tests for the Ford Aspire.

To create a SIMILAR class of vehicle, we first looked at the Test Weight of one of the frontal impact tests for the ASPIRE, which was reported as 2389 pounds.

We then looked at the NHTSA database for Flat Rear Ends (Hatchback/Station Wagon) that have REAR IMPACT TESTS and had a TEST WEIGHT of 2289-2489 pounds (+/- 100 pounds).

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

Available Test Results
Rear Impact Test Summary

Report Filter Settings

Year Range: 1965 - 2012

Vehicle Weight Range: 2289-2489

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	KEES (mph)	Vehicle Width Stiffness Values A	B	G	Kv	Crush Factor
294	1981 MAZDA GLC FIVE DOOR HATCHBACK	5.0	21.0	27.7	166.2	36.0	383.6	53.6	14.7
1047	1986 MAZDA 323 THREE DOOR HATCHBACK	5.0	13.7	23.2	202.6	53.8	381.7	87.4	15.7
389	1981 MERCURY LYNX THREE DOOR HATCHBACK	5.0	13.1	23.3	204.5	56.9	367.4	92.3	16.5
926	1984 SUBARU GLF STATION WAGON	5.0	13.5	23.4	205.6	55.9	377.9	90.6	16.2
1111	1986 YUGO GV THREE DOOR HATCHBACK	5.0	14.1	23.7	205.8	54.7	387.3	87.9	16.0
250	1979 MAZDA GLC THREE DOOR HATCHBACK	5.0	8.9	23.7	313.1	132.0	371.3	212.0	25.3
229	1979 NISSAN 310 THREE DOOR HATCHBACK	5.0	8.1	23.6	345.0	157.9	376.9	254.5	27.4
1957	1993 HONDA CIVIC THREE DOOR HATCHBACK	5.0	17.6	47.6	360.3	174.3	372.5	217.6	51.5
	Average (AVG)				**250.4**	**90.2**	**377.3**	**137.0**	**22.9**
	Minimum (MIN)				**166.2**	**36.0**	**367.4**	**53.6**	**14.7**
	Maximum (MAX)				**360.3**	**174.3**	**387.3**	**254.5**	**51.5**
	Standard Deviation (STDev-sample)				**76.0**	**55.0**	**6.7**	**77.4**	**12.5**
	Number of Tests (n)			**8**					

Available Test Results
Rear Impact Test Summary

Report Filter Settings

Year Range: 1965 - 2012

Vehicle Weight Range: 2289-2489

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	KEES (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
146	1979 DODGE COLT THREE DOOR HATCHBACK	5.0	21.0	28.1	158.5	34.9	360.2	51.6	15.0
6	1979 VOLKSWAGEN RABBIT THREE DOOR HATC...	5.0	21.4	27.4	163.5	34.3	390.3	51.2	14.1
926	1984 SUBARU GLF STATION WAGON	5.0	14.8	23.4	187.4	46.5	377.9	75.3	14.7
1047	1986 MAZDA 323 THREE DOOR HATCHBACK	5.0	14.1	23.2	196.7	50.7	381.7	82.4	15.2
1111	1986 YUGO GV THREE DOOR HATCHBACK	5.0	14.5	23.7	199.9	51.6	387.3	82.8	15.5
389	1981 MERCURY LYNX THREE DOOR HATCHBACK	5.0	13.4	23.3	200.4	54.7	367.4	88.7	16.2
250	1979 MAZDA GLC THREE DOOR HATCHBACK	5.0	13.5	23.7	205.8	57.0	371.3	91.6	16.7
229	1979 NISSAN 310 THREE DOOR HATCHBACK	5.0	13.0	23.6	215.3	61.5	376.9	99.1	17.1
1957	1993 HONDA CIVIC THREE DOOR HATCHBACK	5.0	21.7	47.6	292.6	114.9	372.5	143.5	41.8
1959	1993 HONDA CIVIC THREE DOOR HATCHBACK	5.0	18.3	47.6	344.8	160.2	371.0	200.0	49.4
	Average (AVG)				**216.5**	**66.6**	**375.7**	**96.6**	**21.6**
	Minimum (MIN)				**158.5**	**34.3**	**360.2**	**51.2**	**14.1**
	Maximum (MAX)				**344.8**	**160.2**	**390.3**	**200.0**	**49.4**
	Standard Deviation (STDev-sample)				**58.0**	**39.8**	**9.1**	**44.6**	**12.8**
	Number of Tests (n)			**10**					

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: 1NXBR32E93Z040224

Model:	2003 Toyota Corolla 4-Door Sedan
Engine Size:	1.8L / 109 cu.in.
Engine Description:	Inline 4 Cylinder with Dual Overhead Cam
Horse Power:	140 @ 6400 rpm
Torque:	125 lb-ft @ 4200 rpm
Injection System:	Electronic Fuel Injection (EFI)
PSI:	44-50 psi
Ignition:	electronic
Manufacturer:	Toyota
Assembly Plant:	NUMMI, Fremont, CA
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Dual Front Air Bags

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

The Fourth character (B) indicates a 4-Door Sedan

The Fifth character (R) indicates the OEM engine: 1.8L / 109 cu.in., L4,DOHC

The Sixth and Eighth characters (3E) 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 (3) indicates the model year 2003

The Eleventh character (Z) indicates the vehicle was made in the assembly plant in NUMMI, Fremont, CA

The Twelfth through Seventeenth characters (040224) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.2

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

6/6/2012

2003 TOYOTA COROLLA 4 DOOR SEDAN

Curb Weight:	2546 lbs.		1155	kg.
Curb Weight Distribution - Front:	61 %	Rear:	39	%
Gross Vehicle Weight Rating:	3585 lbs.		1626	kg.
Number of Tires on Vehicle:	4			
Drive Wheels:	FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	178	14.83	4.52
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:	7	0.58	0.18
Front Bumper to Base of Windshield:	44	3.67	1.12
Front Bumper to Top of Windshield:	75	6.25	1.91
Rear Bumper to Rear Axle:	39	3.25	0.99
Rear Bumper to Rear of Rear Well:	25	2.08	0.64
Rear Bumper to Rear of Trunk:	6	0.50	0.15
Rear Bumper to Base of Rear Window:	20	1.67	0.51
Width Dimensions			
Maximum Width:	67	5.58	1.70
Front Track:	58	4.83	1.47
Rear Track:	57	4.75	1.45
Vertical Dimensions			
Height:	58	4.83	1.47
Ground to -			
Front Bumper (Top)	23	1.92	0.58
Headlight - center	28	2.33	0.71
Hood - top front:	30	2.50	0.76
Base of Windshield	39	3.25	0.99
Rear Bumper - top:	26	2.17	0.66
Trunk - top rear:	42	3.50	1.07
Base of Rear Window:	43	3.58	1.09

2003 TOYOTA COROLLA 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	53	4.42	1.35
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	41	3.42	1.04
Rear Seat Shoulder Width	54	4.50	1.37
Rear Seat to Headliner	37	3.08	0.94
Front Leg Room - seatback to floor (min)	35	2.92	0.89

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	420	35.00	10.67
Steering Ratio:	:1		
Wheel Radius:			
Tire Size (OEM):	P185/65R15		

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 pavement):
d = 129.0 ft t = 2.9 sec a = -30.0 ft/sec² G-force = -0.93

Acceleration:

0 to 30mph	t =	2.9	sec	a =	15.2	ft/sec²	G-force = 0.47
0 to 60mph	t =	7.9	sec	a =	11.1	ft/sec²	G-force = 0.35
45 to 65mph	t =		sec	a =		ft/sec²	G-force =

Transmission Type: 5spd MANUAL

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2003 - 2004

2003 TOYOTA COROLLA 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.27	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	39.78
Inches in front of rear axle	=	62.22
Inches from side of vehicle	=	33.50
Inches from ground	=	22.77
Inches from front corner	=	83.77
Inches from rear corner	=	106.62
Inches from front bumper	=	76.78
Inches from rear bumper	=	101.22

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	1416.38	lb*ft*sec²
Pitch Moment of Inertia	=	1371.54	lb*ft*sec²
Roll Moment of Inertia	=	308.28	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	45.0	deg
Angle Front of Hood to Windshield Base	=	13.7	deg
Angle Front of Hood to Windshield Top	=	20.9	deg
Angle of Windshield	=	28.7	deg
Angle of Steering Tires at Max Turn	=	27.8	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 (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

Derived from

NHTSA Crash Test

#4096

2003 TOYOTA COROLLA

Provided By

4N6XPRT StifCalcs®

Registered to:

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

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: **2003 TOYOTA COROLLA**

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

Year Range	Make	Model	Body Styles	Wheelbase
1998 - 2002	CHEVROLET	PRIZM	4D, 5D	97.1
Remarks: RESTYLE. WAS GEO				
1998 - 2003	TOYOTA	COROLLA	2D, 3D, 4D, SW	102.4
Remarks: NOT NEW '03 COROLLA				

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 #	**4096**	NHTSA Test Reference Guide Version #	**V5**			
Test Date	**2002-03-06**	Contract #	**DTNH22-97-C-11033**			
Contract/Study Title	**FMVSS 214 INDICANT - 2003 TOYOTA COROLLA**					
Test Objective(s)	**VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT PERFORMANCE DATA**					
Test Type	**COMPLIANCE - INDICANT TEST**	Configuration	**IMPACTOR INTO VEHICLE**			
Impact Angle	**270**	Side Impact Point	**N/A**	mm	**N/A**	inches
			0	mm	**0.0**	inches
		Closing Speed	**62.0**	Km/Hr	**38.52**	MPH
Test Performer	**MGA RESEARCH**					
Test Reference #	**BT02030601**					
Test Track Surface	**CONCRETE**	Condition	**DRY**			
Ambient Temperature	**20** C **68.0** F	Total Number of Curves	**55**			
Data Recorder Type	**OTHER**	Data Link	**OTHER**			
Test Commentary	**EME ON BOARD DAS 3200**					

Fixed Barrier Information

Barrier Type		Pole Barrier Diameter		mm	inches
Barrier Shape					
Barrier Commentary					

2003 TOYOTA COROLLA LEFT FRONT SEAT OCCUPANT

Test #	4096		
Vehicle #	2	Sex	MALE
Location	LEFT FRONT SEAT	Age	0
Position	CENTER POSITION	Height	0 mm 0.0 inches
Type	NHTSA SIDE IMPACT DUMMY	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	SIDE IMPACT DUMMY		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 037		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO WND SILL & SHOULDER; CHEST TO DOOR PANEL & ARMREST		

Head

Head to -

Windshielder Header	303	mm	11.9	inches	Head Injury Criteria (HIC)	680	
WindShield	529	mm	20.8	inches	HIC Lower Time Interval (ms)	49.4	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	85.4	
Side Header	177	mm	7.0	inches			
Side Window	281	mm	11.1	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): OTHER

Second Contact Region (Head):

Chest

Chest to -

Dash	504	mm	19.8	inches	Arm to Door	90	mm	3.5	inches
Steering Wheel	628	mm	24.7	inches	Hip to Door	161	mm	6.3	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index: 0 — Pelvic Peak Lateral Acceleration (g's): 96.2

Thoracic Trauma Index: 72 — Thorax Peak Acceleration (g's): 0

Lap Belt Peak Load: 0 Newtons 0.0 pound Force

Shoulder Belt Peak Load: 0 Newtons 0.0 pound Force

First Contact Region (Chest/Abdomen): OTHER

Second Contact Region (Chest/Abdomen): OTHER

Legs

Knees to Dash 147 mm 5.8 inches — Knees to Seatback 0 mm 0.0 inches

Left Femur Peak Load 0 Newtons 0.0 pounds Force

Right Femur Peak Load 0 Newtons 0.0 pounds Force

First Contact Region (Legs): OTHER

Second Contact Region (Legs):

2003 TOYOTA COROLLA LEFT FRONT SEAT OCCUPANT

Test #	4096					
Vehicle #	2	Sex	MALE			
Location	LEFT FRONT SEAT	Age	0			
Position	CENTER POSITION	Height	0	mm	0.0	inches
Type	NHTSA SIDE IMPACT DUMMY	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	SIDE IMPACT DUMMY
Occupant Manufacturer	FIRST TECHNOLOGY S/N 037
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO WND SILL & SHOULDER; CHEST TO DOOR PANEL & ARMREST

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY
Restraint # 2	NONE
Mounted	NOT APPLICABLE
Deployment	NOT APPLICABLE
Restraint Commentary	SECONDARY

2003 TOYOTA COROLLA LEFT REAR SEAT OCCUPANT

Test #	4096		
Vehicle #	2	Sex	MALE
Location	LEFT REAR SEAT	Age	0
Position	NON-ADJUSTABLE SEAT	Height	0 mm 0.0 inches
Type	NHTSA SIDE IMPACT DUMMY	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	SIDE IMPACT DUMMY		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 036		
Occupant Modification			
Occupant Description			
Occupant Commentary	CHEST TO DOOR PANEL & ARMREST; LEFT LEG TO DOOR PANEL; RT TO LT LEG		

Head

Head to -

Windshielder Header	0	mm	0.0	inches	Head Injury Criteria (HIC)	988	
WindShield	0	mm	0.0	inches	HIC Lower Time Interval (ms)	43.6	
Seatback	635	mm	25.0	inches	HIC Upper Time Interval (ms)	54.8	
Side Header	190	mm	7.5	inches			
Side Window	323	mm	12.7	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): C PILLAR

Second Contact Region (Head):

Chest

Chest to -

Dash	0	mm	0.0	inches	Arm to Door	78	mm	3.1	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	130	mm	5.1	inches
Seatback	570	mm	22.4	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	70.1
Thoracic Trauma Index	71	Thorax Peak Acceleration (g's)	0

Lap Belt Peak Load 0 Newtons 0.0 pound Force

Shoulder Belt Peak Load 0 Newtons 0.0 pound Force

First Contact Region (Chest/Abdomen): OTHER

Second Contact Region (Chest/Abdomen): OTHER

Legs

Knees to Dash 0 mm 0.0 inches Knees to Seatback 225 mm 8.9 inches

Left Femur Peak Load 0 Newtons 0.0 pounds Force

Right Femur Peak Load 0 Newtons 0.0 pounds Force

First Contact Region (Legs): OTHER

Second Contact Region (Legs):

2003 TOYOTA COROLLA LEFT REAR SEAT OCCUPANT

Test #	4096					
Vehicle #	2	Sex	MALE			
Location	LEFT REAR SEAT	Age	0			
Position	NON-ADJUSTABLE SEAT	Height	0	mm	0.0	inches
Type	NHTSA SIDE IMPACT DUMMY	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	SIDE IMPACT DUMMY
Occupant Manufacturer	FIRST TECHNOLOGY S/N 036
Occupant Modification	
Occupant Description	
Occupant Commentary	CHEST TO DOOR PANEL & ARMREST; LEFT LEG TO DOOR PANEL; RT TO LT LEG

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY
Restraint # 2	NONE
Mounted	NOT APPLICABLE
Deployment	NOT APPLICABLE
Restraint Commentary	SECONDARY

Vehicle 1 0 NHTSA DEFORMABLE IMPACTOR

Test #	4096		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	0 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description			
Vehicle Commentary	FMVSS 214 DEFORMABLE BARRIER AND IMPACTOR		

Vehicle Length	4115	mm	162.0	inches	CG behind Front Axle	1106	mm	43.5	inches
Vehicle Width	1252	mm	49.3	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2591	mm	102.0	inches	Total Length of Indentation	0	mm	0.0	inches
Vehicle Test Weight	1362	KG	3002	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	62	kph	38.5	mph

Vehicle Damage Index: | Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	0	mm	0.0	inches
DPD 2	0	mm	0.0	inches
DPD 3	0	mm	0.0	inches
DPD 4	0	mm	0.0	inches
DPD 5	0	mm	0.0	inches
DPD 6	0	mm	0.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Centerline	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Right Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
27.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
NOT APPLICABLE	27.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 0 NHTSA DEFORMABLE IMPACTOR

Test #	4096		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	0 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description			
Vehicle Commentary	FMVSS 214 DEFORMABLE BARRIER AND IMPACTOR		

Vehicle Length	4115	mm	162.0	inches	CG behind Front Axle	1106	mm	43.5	inches
Vehicle Width	1252	mm	49.3	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2591	mm	102.0	inches	Total Length of Indentation	0	mm	0.0	inches
Vehicle Test Weight	1362	KG	3002	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	62	kph	38.5	mph

Vehicle Damage Index		Principal Direction of Force	0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				0	0.0	0	0.0				
				Engine Block							
				0	0.0	0	0.0				
0	0.0	0	0.0	Front Bumper Corner				0	0.0	0	0.0
				Front of Engine							
				0	0.0	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	0.0	Upper Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Bottom of 'A' Post				0	0.0	0	0.0
0	0.0	0	0.0	Upper Trailing Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Trailing Edge of Door				0	0.0	0	0.0
				Steering Column							
				0	0.0	0	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				0	0.0	0	0.0				
				Center of Steering Column to Headliner (Vertical)							
				0	0.0	0	0.0				

Vehicle 2 2003 TOYOTA COROLLA

Test #	4096		
VIN	1NXBR32E83Z008316	NHTSA Test Vehicle Number	2
Year	2003	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	TOYOTA	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	COROLLA	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	1.8 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary			

Vehicle Length	4488	mm	176.7	inches	CG behind Front Axle	1133	mm	44.6	inches
Vehicle Width	1700	mm	66.9	inches	Center of Damage to CG Axis	-52	mm	-2.0	inches
Vehicle Wheelbase	2600	mm	102.4	inches	Total Length of Indentation	3150	mm	124.0	inches
Vehicle Test Weight	1367	KG	3013	pounds	Maximum Static Crush Depth	338	mm	13.3	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index: 03LPAW2

Principal Direction of Force: 297

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	-2	mm	-0.1	inches
DPD 2	276	mm	10.9	inches
DPD 3	341	mm	13.4	inches
DPD 4	222	mm	8.7	inches
DPD 5	12	mm	0.5	inches
DPD 6	0	mm	0.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	142.6	inches	141.1	inches	1.5	inches
	3621	mm	3584	mm	37	mm
Centerline	176.7	inches	177.8	inches	-1.1	inches
	4488	mm	4517	mm	-29	mm
Right Bumper Corner	142.7	inches	143.1	inches	-0.4	inches
	3624	mm	3634	mm	-10	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
27.0	DIRECT ENGAGEMENT	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
NOT APPLICABLE	0.0	DIRECT ENGAGEMENT
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 2 2003 TOYOTA COROLLA

Test #	4096		
VIN	1NXBR32E83Z008316	NHTSA Test Vehicle Number	2
Year	2003	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	TOYOTA	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	COROLLA	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	1.8 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary			

Vehicle Length	4488	mm	176.7	inches	CG behind Front Axle	1133	mm	44.6	inches
Vehicle Width	1700	mm	66.9	inches	Center of Damage to CG Axis	-52	mm	-2.0	inches
Vehicle Wheelbase	2600	mm	102.4	inches	Total Length of Indentation	3150	mm	124.0	inches
Vehicle Test Weight	1367	KG	3013	pounds	Maximum Static Crush Depth	338	mm	13.3	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index	03LPAW2	Principal Direction of Force	297

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				4488	176.7	4517	177.8				
				Engine Block							
				0	0.0	0	0.0				
3621	142.6	3584	141.1	Front Bumper Corner				3624	142.7	3634	143.1
				Front of Engine							
				0	0.0	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	0.0	Upper Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Bottom of 'A' Post				0	0.0	0	0.0
0	0.0	0	0.0	Upper Trailing Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Trailing Edge of Door				0	0.0	0	0.0
				Steering Column							
				0	0.0	0	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				0	0.0	0	0.0				
				Center of Steering Column to Headliner (Vertical)							
				0	0.0	0	0.0				

2003 TOYOTA COROLLA

NHTSA Crash Test - #4096 - Side Impact

Damage Profile Distances - Indention Length - KE Equivalent Speed - Trapezoidal Average

Test Vehicle Weight =	3013 pounds	Impactor Weight =	3002
KE Equivalent Speed =	27.2 MPH	Impactor Test Speed =	38.5
Test Crush Length =	124.0 inches		

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Rear)	-0.1	10.9	13.4	8.7	0.5	0.0	(Front)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 0.5 inches					57708.7
Using a Rated No Damage Speed of	1.0mph	1021.2	53545.9	9.7	
Using a Rated No Damage Speed of	2.0mph	1964.6	49538.9	39.0	
Using a Rated No Damage Speed of	3.0mph	2830.0	45687.7	87.6	
Using a Rated No Damage Speed of	5.0mph	4327.1	38452.7	243.5	
Average Crush = 6.7 inches					321.4
Using a Rated No Damage Speed of	1.0mph	76.2	298.2	9.7	
Using a Rated No Damage Speed of	2.0mph	146.6	275.9	39.0	
Using a Rated No Damage Speed of	3.0mph	211.2	254.4	87.6	
Using a Rated No Damage Speed of	5.0mph	322.9	214.1	189.0	
Maximum Crush = 13.4 inches					80.3
Using a Rated No Damage Speed of	1.0mph	38.1	74.6	9.7	
Using a Rated No Damage Speed of	2.0mph	73.3	69.0	39.0	
Using a Rated No Damage Speed of	3.0mph	105.6	63.6	87.6	
Using a Rated No Damage Speed of	5.0mph	161.5	53.5	243.5	

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, lb/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 Factor	Maximum Crush (inches)	Calculated Impact Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	13.4	26.5	-0.7	-2.6

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 22.1

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
Side Impact Test Summary

Report Filter Settings

Year Range: 2003 - 2008
Make: TOYOTA
Model: COROLLA

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
3679	1999 CHEVROLET PRIZM FOUR DOOR SEDAN	2.0	8.0	25.3	90.5	131.5	31.1	155.0	32.0
4097	2003 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	7.4	27.0	111.2	188.9	32.7	220.2	39.7
4455	2003 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	6.9	26.9	122.9	221.7	34.1	258.7	41.9
2957	1999 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	6.2	27.1	125.4	253.1	31.1	295.0	47.2
2728	1998 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	8.0	27.3	129.3	203.6	41.0	237.1	37.2
4096	2003 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	6.7	27.2	146.6	275.8	39.0	321.3	44.2
3697	1999 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	9.4	23.7	148.4	171.1	64.3	204.1	23.9
3700	1999 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	9.8	23.9	151.8	169.3	68.0	201.6	23.3
2721	1998 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	6.4	23.8	152.5	257.8	45.1	307.3	35.1
	Average (AVG)				**131.0**	**208.1**	**42.9**	**244.5**	**36.1**
	Minimum (MIN)				**90.5**	**131.5**	**31.1**	**155.0**	**23.3**
	Maximum (MAX)				**152.5**	**275.8**	**68.0**	**321.3**	**47.2**
	Standard Deviation (STDev-sample)				**21.1**	**48.0**	**14.0**	**55.6**	**8.4**
	Number of Tests (n)			**9**					

Available Test Results
Side Impact Test Summary

Report Filter Settings

Year Range: 2003 - 2008
Make: TOYOTA
Model: COROLLA

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
3679	1999 CHEVROLET PRIZM FOUR DOOR SEDAN	2.0	19.6	25.3	37.0	21.9	31.1	25.9	13.1
2957	1999 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	14.4	27.1	54.0	46.9	31.1	54.6	20.3
4097	2003 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	14.1	27.0	58.1	51.6	32.7	60.2	20.8
4455	2003 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	13.5	26.9	63.0	58.3	34.1	68.0	21.5
2728	1998 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	15.4	27.3	67.7	55.9	41.0	65.1	19.5
4096	2003 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	13.4	27.2	73.2	68.7	39.0	80.0	22.1
2721	1998 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	11.1	23.8	88.2	86.2	45.1	102.7	20.3
3697	1999 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	12.3	23.7	113.8	100.6	64.3	120.0	18.3
3700	1999 TOYOTA COROLLA FOUR DOOR SEDAN	2.0	12.8	23.9	116.4	99.6	68.0	118.6	17.8
	Average (AVG)				**74.6**	**65.5**	**42.9**	**77.2**	**19.3**
	Minimum (MIN)				**37.0**	**21.9**	**31.1**	**25.9**	**13.1**
	Maximum (MAX)				**116.4**	**100.6**	**68.0**	**120.0**	**22.1**
	Standard Deviation (STDev-sample)				**26.8**	**26.0**	**14.0**	**31.4**	**2.7**
	Number of Tests (n)			**9**					

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: 2FAFP72WX6X101353

Model:	2006 Ford Crown Victoria 4 door Sedan
Engine Size:	4.6 L/ 281 cu.in.
Engine Description:	V-8 cylinder with Overhead Cam
Horse Power:	220 @ 4750 rpm
Torque:	265 lb-ft @ 3250 rpm
Injection System:	Sequential Port Fuel Injection (SEFI)
PSI:	35-45 psi
Ignition:	electronic
Manufacturer:	Ford
Assembly Plant:	St. Thomas, Ontario
Drive Wheels:	This is a Rear Wheel Drive vehicle w/ Manual Seatbelts + Driver/Passenger Front Air Bags

The First through Third characters (2FA) indicate a Ford Passenger Car made in Canada

The Fourth character (F) indicates Manual Seatbelts + Driver/Passenger Front Air Bags

The Fifth through Seventh characters (P72) indicate a Crown Victoria and a 4 door Sedan

The Eighth character (W) indicates the OEM engine: 4.6 L/ 281 cu.in., V8, OHC

The Ninth character (the check digit) is entered as X.
The VIN appears Valid, the calculated value is 10. (The display Character should be X)

The Tenth character (6) indicates the model year 2006

The Eleventh character (X) indicates the vehicle was made in the assembly plant in St. Thomas, Ontario

The Twelfth through Seventeenth characters (101353) indicate the Serial Number and are unique to this vehicle.

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: 2FAFP72W46X101395

Model:	2006 Ford Crown Victoria 4 door Sedan
Engine Size:	4.6 L/ 281 cu.in.
Engine Description:	V-8 cylinder with Overhead Cam
Horse Power:	220 @ 4750 rpm
Torque:	265 lb-ft @ 3250 rpm
Injection System:	Sequential Port Fuel Injection (SEFI)
PSI:	35-45 psi
Ignition:	electronic
Manufacturer:	Ford
Assembly Plant:	St. Thomas, Ontario
Drive Wheels:	This is a Rear Wheel Drive vehicle w/ Manual Seatbelts + Driver/Passenger Front Air Bags

The First through Third characters (2FA) indicate a Ford Passenger Car made in Canada

The Fourth character (F) indicates Manual Seatbelts + Driver/Passenger Front Air Bags

The Fifth through Seventh characters (P72) indicate a Crown Victoria and a 4 door Sedan

The Eighth character (W) indicates the OEM engine: 4.6 L/ 281 cu.in., V8, OHC

The Ninth character (the check digit) is entered as 4.
The VIN appears Valid, the calculated value is 4.

The Tenth character (6) indicates the model year 2006

The Eleventh character (X) indicates the vehicle was made in the assembly plant in St. Thomas, Ontario

The Twelfth through Seventeenth characters (101395) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

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

5/9/2012

2006 FORD CROWN VICTORIA 4 DOOR SEDAN

Curb Weight:		4057	lbs.	1840	kg.
Curb Weight Distribution -	Front:	56	% Rear:	44	%
Gross Vehicle Weight Rating:		5500	lbs.	2495	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		REAR			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	212	17.67	5.38
Wheelbase:	115	9.58	2.92
Front Bumper to Front Axle:	43	3.58	1.09
Front Bumper to Front of Front Well:	26	2.17	0.66
Front Bumper to Front of Hood:	8	0.67	0.20
Front Bumper to Base of Windshield:	65	5.42	1.65
Front Bumper to Top of Windshield:	91	7.58	2.31
Rear Bumper to Rear Axle:	54	4.50	1.37
Rear Bumper to Rear of Rear Well:	38	3.17	0.97
Rear Bumper to Rear of Trunk:	8	0.67	0.20
Rear Bumper to Base of Rear Window:	38	3.17	0.97
Width Dimensions			
Maximum Width:	78	6.50	1.98
Front Track:	63	5.25	1.60
Rear Track:	66	5.50	1.68
Vertical Dimensions			
Height:	57	4.75	1.45
Ground to -			
Front Bumper (Top)	23	1.92	0.58
Headlight - center	27	2.25	0.69
Hood - top front:	31	2.58	0.79
Base of Windshield	39	3.25	0.99
Rear Bumper - top:	25	2.08	0.64
Trunk - top rear:	39	3.25	0.99
Base of Rear Window:	40	3.33	1.02

2006 FORD CROWN VICTORIA 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	61	5.08	1.55
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	43	3.58	1.09
Rear Seat Shoulder Width	60	5.00	1.52
Rear Seat to Headliner	38	3.17	0.97
Front Leg Room - seatback to floor (min)	40	3.33	1.02

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	480	40.00	12.19
Steering Ratio: :1			
Wheel Radius:	12	1.00	0.30
Tire Size (OEM): P225/60R16			

Acceleration & Braking Information

Brake Type: ALL DISC
ABS System: ALL WHEEL ABS

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):
d = 140.0 ft t = 3.2 sec a = -27.6 ft/sec² G-force = -0.86

Acceleration:

0 to 30mph	t =	2.8	sec	a =	15.7	ft/sec²	G-force = 0.49
0 to 60mph	t =	8.0	sec	a =	11.0	ft/sec²	G-force = 0.34
45 to 65mph	t =	5.1	sec	a =	5.8	ft/sec²	G-force = 0.18

Transmission Type: 4spd AUTOMATIC

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2003 - 2009

2006 FORD CROWN VICTORIA 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.44	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	50.60
Inches in front of rear axle	=	64.40
Inches from side of vehicle	=	39.00
Inches from ground	=	22.37
Inches from front corner	=	101.40
Inches from rear corner	=	124.66
Inches from front bumper	=	93.60
Inches from rear bumper	=	118.40

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	2972.71	lb*ft*sec²
Pitch Moment of Inertia	=	2867.43	lb*ft*sec²
Roll Moment of Inertia	=	580.26	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	45.0	deg
Angle Front of Hood to Windshield Base	=	8.0	deg
Angle Front of Hood to Windshield Top	=	16.1	deg
Angle of Windshield	=	31.6	deg
Angle of Steering Tires at Max Turn	=	27.5	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:

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

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

Derived from

NHTSA Crash Test

#3480

2001 LINCOLN TOWN CAR

Provided By

4N6XPRT StifCalcs®

Registered to:

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

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: **2006 FORD CROWN VICTORIA**

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

Year Range	Make	Model	Body Styles	Wheelbase
1998 - 2011	LINCOLN	TOWN CAR	2D, 4D	117.4
Remarks: Could use Crown Victoria/Grand Marquis - same basic RWD Chassis, longer WB				
2003 - 2010	FORD	CROWN VICTORIA	4D	114.7, 133
Remarks: REVISED "STIFFER FRAME"				
2003 - 2010	MERCURY	GRAND MARQUIS	2D, 4D, SW	114.7
Remarks: ALSO MARAUDER				

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 #	3480	NHTSA Test Reference Guide Version #	V5			
Test Date	2000-11-09	Contract #				
Contract/Study Title	OPTIONAL NCAP - 2001 LINCOLN TOWNCAR 4 DOOR SEDAN					
Test Objective(s)	VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT PERFORMANCE DATA					
Test Type	OPTIONAL NEW CAR ASSESSMENT TEST	Configuration	VEHICLE INTO BARRIER			
Impact Angle	0	Side Impact Point	0	mm	0.0	inches
		Offset Distance	0	mm	0.0	inches
		Closing Speed	56.5	Km/Hr	35.11	MPH
Test Performer	MGA RESEARCH					
Test Reference #	BT00110901					
Test Track Surface	CONCRETE	Condition	WET			
Ambient Temperature	21 C	69.8 F	Total Number of Curves	97		
Data Recorder Type	OTHER	Data Link	OTHER			
Test Commentary	EME ON BOARD DAS 3200					

Fixed Barrier Information

Barrier Type	RIGID	Pole Barrier Diameter	0	mm	0 inches
Barrier Shape	LOAD CELL BARRIER				
Barrier Commentary					

2001 LINCOLN TOWN CAR LEFT FRONT SEAT OCCUPANT

Test #	3480		
Vehicle #	1	Sex	MALE
Location	LEFT FRONT SEAT	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	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 66		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO HEADREST		

Head

Head to -

Windshielder Header	343	mm	13.5	inches	Head Injury Criteria (HIC)	425	
WindShield	568	mm	22.4	inches	HIC Lower Time Interval (ms)	75	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	111	
Side Header	246	mm	9.7	inches			
Side Window	350	mm	13.8	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	532	mm	20.9	inches	Arm to Door	124	mm	4.9	inches
Steering Wheel	286	mm	11.3	inches	Hip to Door	156	mm	6.1	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	359	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	34.7

Lap Belt Peak Load	3302	Newtons	742.3	pound Force
Shoulder Belt Peak Load	4996	Newtons	1123.2	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): AIR BAG

Legs

Knees to Dash	151	mm	5.9	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-4319	Newtons	-971.0	pounds Force
Right Femur Peak Load	-2825	Newtons	-635.1	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2001 LINCOLN TOWN CAR LEFT FRONT SEAT OCCUPANT

Test #	3480					
Vehicle #	1	Sex	MALE			
Location	LEFT FRONT SEAT	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	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N 66
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY
Restraint # 2	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

2001 LINCOLN TOWN CAR RIGHT FRONT SEAT OCCUPANT

Test #	3480		
Vehicle #	1	Sex	MALE
Location	RIGHT FRONT SEAT	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	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 65		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO HEADREST		

Head

Head to -

Windshielder Header	231	mm	9.1	inches	Head Injury Criteria (HIC)	472	
WindShield	551	mm	21.7	inches	HIC Lower Time Interval (ms)	72	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	108	
Side Header	206	mm	8.1	inches			
Side Window	350	mm	13.8	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	538	mm	21.2	inches	Arm to Door	129	mm	5.1	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	132	mm	5.2	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	359	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	35.6

Lap Belt Peak Load	4483	Newtons	1007.8	pound Force
Shoulder Belt Peak Load	4914	Newtons	1104.7	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): AIR BAG

Legs

Knees to Dash	117	mm	4.6	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-2107	Newtons	-473.7	pounds Force
Right Femur Peak Load	-1967	Newtons	-442.2	pounds Force

First Contact Region (Legs): DASHPANEL

Second Contact Region (Legs):

2001 LINCOLN TOWN CAR RIGHT FRONT SEAT OCCUPANT

Test #	3480					
Vehicle #	1	Sex	MALE			
Location	RIGHT FRONT SEAT	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	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N 65
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - MID
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

Vehicle 1 2001 LINCOLN TOWN CAR

Test #	3480		
VIN	1LNHM82W11Y633287	NHTSA Test Vehicle Number	1
Year	2001	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	LINCOLN	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	TOWN CAR	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V8 INLINE FRONT		
Displacement	4.6 Liter	Transmission	AUTOMATIC - REAR WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary			

Vehicle Length	5389	mm	212.2	inches	CG behind Front Axle	1409	mm	55.5	inches
Vehicle Width	1986	mm	78.2	inches	Center of Damage to CG Axis	135	mm	5.3	inches
Vehicle Wheelbase	2985	mm	117.5	inches	Total Length of Indentation	1620	mm	63.8	inches
Vehicle Test Weight	2111	KG	4653	pounds	Maximum Static Crush Depth	700	mm	27.6	inches
					Pre-Impact Speed	57	kph	35.1	mph

Vehicle Damage Index: 12FDEW6

Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	447	mm	17.6	inches
DPD 2	599	mm	23.6	inches
DPD 3	642	mm	25.3	inches
DPD 4	700	mm	27.6	inches
DPD 5	699	mm	27.5	inches
DPD 6	557	mm	21.9	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	205.7	inches	185.7	inches	20.0	inches
	5225	mm	4718	mm	507	mm
Centerline	212.2	inches	185.4	inches	26.7	inches
	5389	mm	4710	mm	679	mm
Right Bumper Corner	205.3	inches	183.4	inches	21.9	inches
	5215	mm	4658	mm	557	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 2001 LINCOLN TOWN CAR

Test #	3480		
VIN	1LNHM82W11Y633287	NHTSA Test Vehicle Number	1
Year	2001	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	LINCOLN	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	TOWN CAR	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V8 INLINE FRONT		
Displacement	4.6 Liter	Transmission	AUTOMATIC - REAR WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary			

Vehicle Length	5389	mm	212.2	inches	CG behind Front Axle	1409	mm	55.5	inches
Vehicle Width	1986	mm	78.2	inches	Center of Damage to CG Axis	135	mm	5.3	inches
Vehicle Wheelbase	2985	mm	117.5	inches	Total Length of Indentation	1620	mm	63.8	inches
Vehicle Test Weight	2111	KG	4653	pounds	Maximum Static Crush Depth	700	mm	27.6	inches
					Pre-Impact Speed	57	kph	35.1	mph

Vehicle Damage Index 12FDEW6 Principal Direction of Force 0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				5389	212.2	4710	185.4				
				Engine Block							
				530	20.9	530	20.9				
5225	205.7	4718	185.7	Front Bumper Corner				5215	205.3	4658	183.4
				Front of Engine							
				4539	178.7	4274	168.3				
3936	155.0	3886	153.0	Firewall				3909	153.9	3858	151.9
				4069	160.2	4066	160.1				
3612	142.2	3608	142.0	Upper Leading Edge of Door				3616	142.4	3600	141.7
3664	144.3	3658	144.0	Lower Leading Edge of Door				3657	144.0	3653	143.8
3582	141.0	3564	140.3	Bottom of 'A' Post				3587	141.2	3561	140.2
2554	100.6	2542	100.1	Upper Trailing Edge of Door				2553	100.5	2542	100.1
2575	101.4	2567	101.1	Lower Trailing Edge of Door				2571	101.2	2569	101.1
				Steering Column							
				3105	122.2	3154	124.2				
				Center of Seering Column to 'A' Post (Horizontal)							
				391	15.4	365	14.4				
				Center of Steering Column to Headliner (Vertical)							
				448	17.6	424	16.7				

2001 LINCOLN TOWN CAR

NHTSA Crash Test - #3480 - Front Impact

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

Test Vehicle Weight = 4653 pounds
Vehicle Closing Speed = 35.1 mph
Test Crush Length = 78.2 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	20.0	26.7	21.9	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 20.0 inches					147.0
Using a Rated No Damage Speed of	2.5mph	194.4	126.8	149.1	
Using a Rated No Damage Speed of	5.0mph	359.1	108.1	596.3	
Using a Rated No Damage Speed of	7.5mph	493.9	90.9	1341.7	
Using a Rated No Damage Speed of	10.0mph	598.9	75.2	2385.3	
Average Crush = 23.8 inches					103.8
Using a Rated No Damage Speed of	2.5mph	163.4	89.5	149.1	
Using a Rated No Damage Speed of	5.0mph	301.7	76.3	596.3	
Using a Rated No Damage Speed of	7.5mph	415.0	64.2	1341.7	
Using a Rated No Damage Speed of	10.0mph	503.3	53.1	2385.3	
Maximum Crush = 26.7 inches					82.5
Using a Rated No Damage Speed of	2.5mph	145.7	71.2	149.1	
Using a Rated No Damage Speed of	5.0mph	269.0	60.7	596.3	
Using a Rated No Damage Speed of	7.5mph	370.0	51.0	1341.7	
Using a Rated No Damage Speed of	10.0mph	448.6	42.2	2385.3	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	26.7	37.4	2.3	6.2

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.5

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

2001 LINCOLN TOWN CAR

NHTSA Crash Test - #3480 - Front Impact

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

Test Vehicle Weight = 4653 pounds
Vehicle Closing Speed = 35.1 mph
Test Crush Length = 63.8 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	20.0	26.7	21.9	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 20.0 inches					180.2
Using a Rated No Damage Speed of	2.5mph	238.4	155.5	182.8	
Using a Rated No Damage Speed of	5.0mph	440.2	132.5	731.1	
Using a Rated No Damage Speed of	7.5mph	605.5	111.4	1644.9	
Using a Rated No Damage Speed of	10.0mph	734.2	92.2	2924.2	
Average Crush = 23.8 inches					127.3
Using a Rated No Damage Speed of	2.5mph	200.3	109.8	182.8	
Using a Rated No Damage Speed of	5.0mph	369.9	93.6	731.1	
Using a Rated No Damage Speed of	7.5mph	508.8	78.7	1644.9	
Using a Rated No Damage Speed of	10.0mph	617.0	65.1	2924.2	
Maximum Crush = 26.7 inches					101.1
Using a Rated No Damage Speed of	2.5mph	178.6	87.2	182.8	
Using a Rated No Damage Speed of	5.0mph	329.7	74.4	731.1	
Using a Rated No Damage Speed of	7.5mph	453.5	62.5	1644.9	
Using a Rated No Damage Speed of	10.0mph	550.0	51.7	2924.2	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	26.7	37.4	2.3	6.2

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 18.5

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

2001 LINCOLN TOWN CAR

NHTSA Crash Test - #3480 - Front Impact

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

Test Vehicle Weight = 4653 pounds
Vehicle Closing Speed = 35.1 MPH
Test Crush Length = 78.2 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	17.6	23.6	25.3	27.6	27.5	21.9	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 17.6 inches					189.8
Using a Rated No Damage Speed of	2.5mph	221.0	163.8	149.1	
Using a Rated No Damage Speed of	5.0mph	408.0	139.6	596.3	
Using a Rated No Damage Speed of	7.5mph	561.2	117.4	1341.7	
Using a Rated No Damage Speed of	10.0mph	680.6	97.1	2385.3	
Average Crush = 24.7 inches					96.4
Using a Rated No Damage Speed of	2.5mph	157.4	83.1	149.1	
Using a Rated No Damage Speed of	5.0mph	290.8	70.9	596.3	
Using a Rated No Damage Speed of	7.5mph	399.9	59.6	1341.7	
Using a Rated No Damage Speed of	10.0mph	484.9	49.3	1658.8	
Maximum Crush = 27.6 inches					77.2
Using a Rated No Damage Speed of	2.5mph	140.9	66.6	149.1	
Using a Rated No Damage Speed of	5.0mph	260.2	56.8	596.3	
Using a Rated No Damage Speed of	7.5mph	357.9	47.7	1341.7	
Using a Rated No Damage Speed of	10.0mph	434.0	39.5	2385.3	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	27.6	38.1	3.0	7.8

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 17.9

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

2001 LINCOLN TOWN CAR

NHTSA Crash Test - #3480 - Front Impact

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

Test Vehicle Weight = 4653 pounds
Vehicle Closing Speed = 35.1 MPH
Test Crush Length = 63.8 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	17.6	23.6	25.3	27.6	27.5	21.9	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 17.6 inches					232.7
Using a Rated No Damage Speed of	2.5mph	270.9	200.7	182.8	
Using a Rated No Damage Speed of	5.0mph	500.2	171.1	731.1	
Using a Rated No Damage Speed of	7.5mph	688.0	143.9	1644.9	
Using a Rated No Damage Speed of	10.0mph	834.3	119.0	2924.2	
Average Crush = 24.7 inches					118.2
Using a Rated No Damage Speed of	2.5mph	193.0	101.9	182.8	
Using a Rated No Damage Speed of	5.0mph	356.4	86.9	731.1	
Using a Rated No Damage Speed of	7.5mph	490.3	73.1	1644.9	
Using a Rated No Damage Speed of	10.0mph	594.5	60.4	2033.6	
Maximum Crush = 27.6 inches					94.6
Using a Rated No Damage Speed of	2.5mph	172.7	81.6	182.8	
Using a Rated No Damage Speed of	5.0mph	319.0	69.6	731.1	
Using a Rated No Damage Speed of	7.5mph	438.8	58.5	1644.9	
Using a Rated No Damage Speed of	10.0mph	532.0	48.4	2924.2	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	27.6	38.1	3.0	7.8

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 17.9

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: 2003 - 2010
Make: FORD
Model: CROWN VICTORIA

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Width Stiffness A	Vehicle Width Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
3219	2000 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	26.8	35.1	263.7	59.2	587.0	80.5	18.4
3480	2001 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	24.7	35.1	290.3	70.7	596.3	96.1	19.9
5803	2006 FORD OTHER FOUR DOOR SEDAN	5.0	21.5	35.2	300.6	84.5	535.0	114.7	23.1
4476	2003 FORD CROWN VICTORIA FOUR DOOR SEDAN	5.0	23.0	35.3	318.1	83.9	603.6	113.8	21.7
	Average (AVG)				**293.2**	**74.6**	**580.5**	**101.3**	**20.8**
	Minimum (MIN)				**263.7**	**59.2**	**535.0**	**80.5**	**18.4**
	Maximum (MAX)				**318.1**	**84.5**	**603.6**	**114.7**	**23.1**
	Standard Deviation (STDev-sample)				**22.8**	**12.1**	**31.1**	**16.3**	**2.1**
	Number of Tests (n)			**4**					

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2003 - 2010
Make: FORD
Model: CROWN VICTORIA

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
3219	2000 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	27.8	35.1	254.0	54.9	587.0	74.7	17.7
3480	2001 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	27.6	35.1	260.6	56.9	596.3	77.4	17.9
5803	2006 FORD OTHER FOUR DOOR SEDAN	5.0	24.4	35.2	265.4	65.8	535.0	89.4	20.4
4476	2003 FORD CROWN VICTORIA FOUR DOOR SEDAN	5.0	25.3	35.3	289.4	69.4	603.6	94.1	19.7
	Average (AVG)				**267.4**	**61.8**	**580.5**	**83.9**	**18.9**
	Minimum (MIN)				**254.0**	**54.9**	**535.0**	**74.7**	**17.7**
	Maximum (MAX)				**289.4**	**69.4**	**603.6**	**94.1**	**20.4**
	Standard Deviation (STDev-sample)				**15.4**	**7.0**	**31.1**	**9.3**	**1.3**
	Number of Tests (n)			**4**					

Stiffness Values and Test Data

Derived from

NHTSA Crash Test

#5803

2006 FORD OTHER

Provided By

4N6XPRT StifCalcs®

Registered to:

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

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: **2006 FORD CROWN VICTORIA**

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

Year Range	Make	Model	Body Styles	Wheelbase
1998 - 2011	LINCOLN	TOWN CAR	2D, 4D	117.4
Remarks: Could use Crown Victoria/Grand Marquis - same basic RWD Chassis, longer WB				
2003 - 2010	FORD	CROWN VICTORIA	4D	114.7, 133
Remarks: REVISED "STIFFER FRAME"				
2003 - 2010	MERCURY	GRAND MARQUIS	2D, 4D, SW	114.7
Remarks: ALSO MARAUDER				

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 #	5803	NHTSA Test Reference Guide Version #	V5			
Test Date	2005-12-14	Contract #	06-6008			
Contract/Study Title	RESEARCH COLLISION TEST					
Test Objective(s)	FRONTAL CRASH					
Test Type	RESEARCH SAFETY VEHICLE TEST	Configuration	VEHICLE INTO BARRIER			
Impact Angle	0	Side Impact Point	9999	mm	0.0	inches
		Offset Distance	9999	mm	0.0	inches
		Closing Speed	56.7	Km/Hr	35.22	MPH
Test Performer	TRANSPORT CANADA					
Test Reference #	TC06-207					
Test Track Surface	CONCRETE	Condition	DRY			
Ambient Temperature	21 C	69.8 F	Total Number of Curves	347		
Data Recorder Type	OTHER	Data Link	OTHER			
Test Commentary	NO COMMENTS					

Fixed Barrier Information

Barrier Type	RIGID	Pole Barrier Diameter	9999	mm	9999 inches
Barrier Shape	LOAD CELL BARRIER				
Barrier Commentary	NO COMMENTS				

2006 FORD OTHER LEFT FRONT SEAT OCCUPANT

Test #	5803		
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	OTHER		
Occupant Manufacturer	FIRST TECHNOLOGY		
Occupant Modification	UNMODIFIED		
Occupant Description	S/N : 105		
Occupant Commentary	LAST CALIBRATION DATE : 31/OCT/05		

Head

Head to -

Windshielder Header	268	mm	10.6	inches	Head Injury Criteria (HIC)	330	
WindShield	652	mm	25.7	inches	HIC Lower Time Interval (ms)	51	
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	87	
Side Header	270	mm	10.6	inches			
Side Window	360	mm	14.2	inches			
Neck to Seatback	9999	mm	0.0	inches			
First Contact Region (Head)	AIR BAG						
Second Contact Region (Head)							

Chest

Chest to -

Dash	9999	mm	0.0	inches	Arm to Door	133	mm	5.2	inches
Steering Wheel	238	mm	9.4	inches	Hip to Door	174	mm	6.9	inches
Seatback	9999	mm	0.0	inches					
Chest Severity Index	9999				Pelvic Peak Lateral Acceleration (g's)	9			
Thoracic Trauma Index	9				Thorax Peak Acceleration (g's)	55.4			
Lap Belt Peak Load	5370	Newtons	1207.2	pound Force					
Shoulder Belt Peak Load	3981	Newtons	895.0	pound Force					
First Contact Region (Chest/Abdomen)	AIR BAG								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	60	mm	2.4	inches	Knees to Seatback	9999	mm	0.0	inches
Left Femur Peak Load	-1257	Newtons	-282.6	pounds Force					
Right Femur Peak Load	-2124	Newtons	-477.5	pounds Force					
First Contact Region (Legs)	DASHPANEL								
Second Contact Region (Legs)									

2006 FORD OTHER LEFT FRONT SEAT OCCUPANT

Test #	5803					
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	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N : 105
Occupant Commentary	LAST CALIBRATION DATE : 31/OCT/05

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	AIR BAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

2006 FORD OTHER RIGHT FRONT SEAT OCCUPANT

Test #	5803		
Vehicle #	1	Sex	FEMALE
Location	RIGHT 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	OTHER		
Occupant Manufacturer	FIRST TECHNOLOGY		
Occupant Modification	UNMODIFIED		
Occupant Description	S/N : 104		
Occupant Commentary	LAST CALIBRATION DATE : 21/NOV/05		

Head

Head to -

Windshielder Header	284	mm	11.2	inches	Head Injury Criteria (HIC)	427	
WindShield	663	mm	26.1	inches	HIC Lower Time Interval (ms)	52.1	
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	88.1	
Side Header	275	mm	10.8	inches			
Side Window	367	mm	14.4	inches			
Neck to Seatback	9999	mm	0.0	inches			
First Contact Region (Head)	AIR BAG						
Second Contact Region (Head)							

Chest

Chest to -

Dash	410	mm	16.1	inches	Arm to Door	184	mm	7.2	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	177	mm	7.0	inches
Seatback	9999	mm	0.0	inches					
Chest Severity Index	9999				Pelvic Peak Lateral Acceleration (g's)	9			
Thoracic Trauma Index	9				Thorax Peak Acceleration (g's)	51.6			
Lap Belt Peak Load	5358	Newtons	1204.5	pound Force					
Shoulder Belt Peak Load	3706	Newtons	833.1	pound Force					
First Contact Region (Chest/Abdomen)	AIR BAG								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	45	mm	1.8	inches	Knees to Seatback	9999	mm	0.0	inches
Left Femur Peak Load	-1582	Newtons	-355.6	pounds Force					
Right Femur Peak Load	-1986	Newtons	-446.5	pounds Force					
First Contact Region (Legs)	DASHPANEL								
Second Contact Region (Legs)									

2006 FORD OTHER RIGHT FRONT SEAT OCCUPANT

Test #	5803					
Vehicle #	1	Sex	FEMALE			
Location	RIGHT 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	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N : 104
Occupant Commentary	LAST CALIBRATION DATE : 21/NOV/05

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	AIR BAG
Mounted	DASH PANEL - TOP
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

2006 FORD OTHER RIGHT REAR SEAT OCCUPANT

Test #	5803		
Vehicle #	1	Sex	FEMALE
Location	RIGHT REAR SEAT	Age	99
Position	NOT APPLICABLE	Height	999 mm 39.3 inches
Type	HYBRID III DUMMY	Weight	999.0 kg 2202 pounds
Size	5 PERCENTILE		
Calibration Method	OTHER		
Occupant Manufacturer	FIRST TECHNOLOGY		
Occupant Modification	UNMODIFIED		
Occupant Description	S/N : 103		
Occupant Commentary	LAST CALIBRATION DATE : 10/NOV/05		

Head

Head to -

Windshielder Header	9999 mm	0.0 inches	Head Injury Criteria (HIC)	919
WindShield	9999 mm	0.0 inches	HIC Lower Time Interval (ms)	65
Seatback	9999 mm	0.0 inches	HIC Upper Time Interval (ms)	101
Side Header	9999 mm	0.0 inches		
Side Window	9999 mm	0.0 inches		

Neck to Seatback 9999 mm 0.0 inches

First Contact Region (Head) NONE

Second Contact Region (Head)

Chest

Chest to -

Dash	9999 mm	0.0 inches	Arm to Door	9999 mm 0.0 inches
Steering Wheel	9999 mm	0.0 inches	Hip to Door	9999 mm 0.0 inches
Seatback	9999 mm	0.0 inches		

Chest Severity Index	9999	Pelvic Peak Lateral Acceleration (g's)	9
Thoracic Trauma Index	9	Thorax Peak Acceleration (g's)	62.1

Lap Belt Peak Load 8630 Newtons 1940.1 pound Force

Shoulder Belt Peak Load 6281 Newtons 1412.0 pound Force

First Contact Region (Chest/Abdomen) NONE

Second Contact Region (Chest/Abdomen) NONE

Legs

Knees to Dash	9999 mm 0.0 inches	Knees to Seatback	9999 mm 0.0 inches
Left Femur Peak Load	-1764 Newtons	-396.6 pounds Force	
Right Femur Peak Load	-2053 Newtons	-461.5 pounds Force	

First Contact Region (Legs) NONE

Second Contact Region (Legs)

2006 FORD OTHER RIGHT REAR SEAT OCCUPANT

Test #	5803					
Vehicle #	1	Sex	FEMALE			
Location	RIGHT REAR SEAT	Age	99			
Position	NOT APPLICABLE	Height	999	mm	39.3	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	5 PERCENTILE					

Calibration Method	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N : 103
Occupant Commentary	LAST CALIBRATION DATE : 10/NOV/05

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	SEAT BACK
Mounted	OTHER
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

2006 FORD OTHER LEFT REAR SEAT OCCUPANT

Test #	5803		
Vehicle #	1	Sex	FEMALE
Location	LEFT REAR SEAT	Age	99
Position	NOT APPLICABLE	Height	999 mm 39.3 inches
Type	HYBRID III DUMMY	Weight	999.0 kg 2202 pounds
Size	5 PERCENTILE		
Calibration Method	OTHER		
Occupant Manufacturer	FIRST TECHNOLOGY		
Occupant Modification	UNMODIFIED		
Occupant Description	S/N : 111		
Occupant Commentary	LAST CALIBRATION DATE : 10/NOV/05		

Head

Head to -

Windshielder Header	9999 mm	0.0 inches	Head Injury Criteria (HIC)	731
WindShield	9999 mm	0.0 inches	HIC Lower Time Interval (ms)	66.2
Seatback	9999 mm	0.0 inches	HIC Upper Time Interval (ms)	102.2
Side Header	9999 mm	0.0 inches		
Side Window	9999 mm	0.0 inches		

Neck to Seatback 9999 mm 0.0 inches

First Contact Region (Head) NONE

Second Contact Region (Head)

Chest

Chest to -

Dash	9999 mm	0.0 inches	Arm to Door	9999 mm 0.0 inches
Steering Wheel	9999 mm	0.0 inches	Hip to Door	9999 mm 0.0 inches
Seatback	9999 mm	0.0 inches		

Chest Severity Index	9999	Pelvic Peak Lateral Acceleration (g's)	9
Thoracic Trauma Index	9	Thorax Peak Acceleration (g's)	53.6

Lap Belt Peak Load 8503 Newtons 1911.6 pound Force

Shoulder Belt Peak Load 5747 Newtons 1292.0 pound Force

First Contact Region (Chest/Abdomen) NONE

Second Contact Region (Chest/Abdomen) NONE

Legs

Knees to Dash 9999 mm 0.0 inches Knees to Seatback 9999 mm 0.0 inches

Left Femur Peak Load -2983 Newtons -670.6 pounds Force

Right Femur Peak Load -2958 Newtons -665.0 pounds Force

First Contact Region (Legs) NONE

Second Contact Region (Legs)

2006 FORD OTHER LEFT REAR SEAT OCCUPANT

Test #	5803					
Vehicle #	1	Sex	FEMALE			
Location	LEFT REAR SEAT	Age	99			
Position	NOT APPLICABLE	Height	999	mm	39.3	inches
Type	HYBRID III DUMMY	Weight	999.0	kg	2202	pounds
Size	5 PERCENTILE					

Calibration Method	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N : 111
Occupant Commentary	LAST CALIBRATION DATE : 10/NOV/05

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS
Restraint # 2	SEAT BACK
Mounted	OTHER
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

Vehicle 1 2006 FORD OTHER

Test #	5803		
VIN	3FAFP07ZX6R106402	NHTSA Test Vehicle Number	1
Year	2006	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	FORD	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	OTHER	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.3 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary	06-207 FORD FUSION		

Vehicle Length	4832	mm	190.2	inches	CG behind Front Axle	1277	mm	50.3	inches
Vehicle Width	1835	mm	72.2	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2727	mm	107.4	inches	Total Length of Indentation	1501	mm	59.1	inches
Vehicle Test Weight	1750	KG	3857	pounds	Maximum Static Crush Depth	9999	mm	0.0	inches
					Pre-Impact Speed	57	kph	35.2	mph

Vehicle Damage Index: 9999999 — Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	375	mm	14.8	inches
DPD 2	546	mm	21.5	inches
DPD 3	619	mm	24.4	inches
DPD 4	618	mm	24.3	inches
DPD 5	598	mm	23.5	inches
DPD 6	327	mm	12.9	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	186.5	inches	164.9	inches	21.7	inches
	4738	mm	4188	mm	550	mm
Centerline	190.2	inches	166.1	inches	24.1	inches
	4832	mm	4220	mm	612	mm
Right Bumper Corner	186.6	inches	164.3	inches	22.3	inches
	4739	mm	4173	mm	566	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
NOT APPLICABLE	99.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 2006 FORD OTHER

Test #	5803		
VIN	3FAFP07ZX6R106402	NHTSA Test Vehicle Number	1
Year	2006	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	FORD	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	OTHER	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2.3 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary	06-207 FORD FUSION		

Vehicle Length	4832	mm	190.2	inches	CG behind Front Axle	1277	mm	50.3	inches
Vehicle Width	1835	mm	72.2	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2727	mm	107.4	inches	Total Length of Indentation	1501	mm	59.1	inches
Vehicle Test Weight	1750	KG	3857	pounds	Maximum Static Crush Depth	9999	mm	0.0	inches
					Pre-Impact Speed	57	kph	35.2	mph

Vehicle Damage Index: 9999999 — Principal Direction of Force: 0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from the Rear Vehicle Surface forward.)

Left Side Pre-Test mm	Left Side Pre-Test inches	Left Side Post-Test mm	Left Side Post-Test inches	Centerline	Centerline Pre-Test mm	Centerline Pre-Test inches	Centerline Post-Test mm	Centerline Post-Test inches	Right Side Pre-Test mm	Right Side Pre-Test inches	Right Side Post-Test mm	Right Side Post-Test inches
				Length of Vehicle at Centerline	4832	190.2	4220	166.1				
				Engine Block	212	8.3	1106	43.5				
4738	186.5	4188	164.9	Front Bumper Corner					4739	186.6	4173	164.3
				Front of Engine	4146	163.2	3726	146.7				
3524	138.7	3473	136.7	Firewall					3527	138.9	3427	134.9
					3723	146.6	0	0.0				
3335	131.3	3336	131.3	Upper Leading Edge of Door					3337	131.4	3334	131.3
3316	130.6	3316	130.6	Lower Leading Edge of Door					3329	131.1	3326	130.9
3291	129.6	3292	129.6	Bottom of 'A' Post					3297	129.8	3293	129.6
2276	89.6	2276	89.6	Upper Trailing Edge of Door					2282	89.8	2277	89.6
2317	91.2	2318	91.3	Lower Trailing Edge of Door					2322	91.4	2319	91.3
				Steering Column	2857	112.5	2893	113.9				
				Center of Seering Column to 'A' Post (Horizontal)	415	16.3	411	16.2				
				Center of Steering Column to Headliner (Vertical)	450	17.7	459	18.1				

2006 FORD OTHER

NHTSA Crash Test - #5803 - Front Impact

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

Test Vehicle Weight = 3857 pounds
Vehicle Closing Speed = 35.2 mph
Test Crush Length = 72.2 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	21.7	24.1	22.3	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 21.7 inches					112.7
Using a Rated No Damage Speed of	2.5mph	161.3	97.3	133.8	
Using a Rated No Damage Speed of	5.0mph	298.0	83.0	535.0	
Using a Rated No Damage Speed of	7.5mph	410.1	69.8	1203.8	
Using a Rated No Damage Speed of	10.0mph	497.4	57.8	2140.1	
Average Crush = 23.0 inches					100.4
Using a Rated No Damage Speed of	2.5mph	152.2	86.6	133.8	
Using a Rated No Damage Speed of	5.0mph	281.2	73.9	535.0	
Using a Rated No Damage Speed of	7.5mph	386.9	62.2	1203.8	
Using a Rated No Damage Speed of	10.0mph	469.3	51.5	2140.1	
Maximum Crush = 24.1 inches					91.4
Using a Rated No Damage Speed of	2.5mph	145.3	78.9	133.8	
Using a Rated No Damage Speed of	5.0mph	268.4	67.3	535.0	
Using a Rated No Damage Speed of	7.5mph	369.2	56.6	1203.8	
Using a Rated No Damage Speed of	10.0mph	447.9	46.9	2140.1	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	24.1	35.6	0.4	1.0

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.6

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

2006 FORD OTHER

NHTSA Crash Test - #5803 - Front Impact

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

Test Vehicle Weight = 3857 pounds
Vehicle Closing Speed = 35.2 mph
Test Crush Length = 59.1 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	21.7	24.1	22.3	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 21.7 inches					137.8
Using a Rated No Damage Speed of	2.5mph	197.2	119.0	163.5	
Using a Rated No Damage Speed of	5.0mph	364.3	101.5	654.1	
Using a Rated No Damage Speed of	7.5mph	501.3	85.4	1471.7	
Using a Rated No Damage Speed of	10.0mph	608.1	70.7	2616.3	
Average Crush = 23.0 inches					122.7
Using a Rated No Damage Speed of	2.5mph	186.1	105.9	163.5	
Using a Rated No Damage Speed of	5.0mph	343.8	90.3	654.1	
Using a Rated No Damage Speed of	7.5mph	473.0	76.0	1471.7	
Using a Rated No Damage Speed of	10.0mph	573.8	62.9	2616.3	
Maximum Crush = 24.1 inches					111.8
Using a Rated No Damage Speed of	2.5mph	177.6	96.4	163.5	
Using a Rated No Damage Speed of	5.0mph	328.1	82.3	654.1	
Using a Rated No Damage Speed of	7.5mph	451.4	69.2	1471.7	
Using a Rated No Damage Speed of	10.0mph	547.6	57.3	2616.3	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	24.1	35.6	0.4	1.0

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.6

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

2006 FORD OTHER

NHTSA Crash Test - #5803 - Front Impact

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

Test Vehicle Weight = 3857 pounds
Vehicle Closing Speed = 35.2 MPH
Test Crush Length = 72.2 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	14.8	21.5	24.4	24.3	23.5	12.9	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 12.9 inches					319.0
Using a Rated No Damage Speed of	2.5mph	271.4	275.4	133.8	
Using a Rated No Damage Speed of	5.0mph	501.3	234.9	535.0	
Using a Rated No Damage Speed of	7.5mph	689.8	197.6	1203.8	
Using a Rated No Damage Speed of	10.0mph	836.8	163.6	2140.1	
Average Crush = 21.5 inches					114.9
Using a Rated No Damage Speed of	2.5mph	162.8	99.1	133.8	
Using a Rated No Damage Speed of	5.0mph	300.8	84.6	535.0	
Using a Rated No Damage Speed of	7.5mph	413.9	71.1	1203.8	
Using a Rated No Damage Speed of	10.0mph	502.1	58.9	1490.5	
Maximum Crush = 24.4 inches					89.2
Using a Rated No Damage Speed of	2.5mph	143.5	77.0	133.8	
Using a Rated No Damage Speed of	5.0mph	265.1	65.7	535.0	
Using a Rated No Damage Speed of	7.5mph	364.7	55.2	1203.8	
Using a Rated No Damage Speed of	10.0mph	442.4	45.7	2140.1	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	24.4	35.8	0.6	1.6

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

2006 FORD OTHER

NHTSA Crash Test - #5803 - Front Impact

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

Test Vehicle Weight = 3857 pounds
Vehicle Closing Speed = 35.2 MPH
Test Crush Length = 59.1 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	14.8	21.5	24.4	24.3	23.5	12.9	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 12.9 inches					390.0
Using a Rated No Damage Speed of	2.5mph	331.8	336.6	163.5	
Using a Rated No Damage Speed of	5.0mph	612.9	287.2	654.1	
Using a Rated No Damage Speed of	7.5mph	843.3	241.6	1471.7	
Using a Rated No Damage Speed of	10.0mph	1023.0	200.0	2616.3	
Average Crush = 21.5 inches					140.4
Using a Rated No Damage Speed of	2.5mph	199.1	121.2	163.5	
Using a Rated No Damage Speed of	5.0mph	367.7	103.4	654.1	
Using a Rated No Damage Speed of	7.5mph	506.0	87.0	1471.7	
Using a Rated No Damage Speed of	10.0mph	613.8	72.0	1822.2	
Maximum Crush = 24.4 inches					109.0
Using a Rated No Damage Speed of	2.5mph	175.4	94.1	163.5	
Using a Rated No Damage Speed of	5.0mph	324.0	80.3	654.1	
Using a Rated No Damage Speed of	7.5mph	445.8	67.5	1471.7	
Using a Rated No Damage Speed of	10.0mph	540.8	55.9	2616.3	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	24.4	35.8	0.6	1.6

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

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2003 - 2010
Make: FORD
Model: CROWN VICTORIA

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Width Stiffness A	Vehicle Width Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
3219	2000 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	26.8	35.1	263.7	59.2	587.0	80.5	18.4
3480	2001 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	24.7	35.1	290.3	70.7	596.3	96.1	19.9
5803	2006 FORD OTHER FOUR DOOR SEDAN	5.0	21.5	35.2	300.6	84.5	535.0	114.7	23.1
4476	2003 FORD CROWN VICTORIA FOUR DOOR SEDAN	5.0	23.0	35.3	318.1	83.9	603.6	113.8	21.7
	Average (AVG)				**293.2**	**74.6**	**580.5**	**101.3**	**20.8**
	Minimum (MIN)				**263.7**	**59.2**	**535.0**	**80.5**	**18.4**
	Maximum (MAX)				**318.1**	**84.5**	**603.6**	**114.7**	**23.1**
	Standard Deviation (STDev-sample)				**22.8**	**12.1**	**31.1**	**16.3**	**2.1**
	Number of Tests (n)			**4**					

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2003 - 2010
Make: FORD
Model: CROWN VICTORIA

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
3219	2000 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	27.8	35.1	254.0	54.9	587.0	74.7	17.7
3480	2001 LINCOLN TOWN CAR FOUR DOOR SEDAN	5.0	27.6	35.1	260.6	56.9	596.3	77.4	17.9
5803	2006 FORD OTHER FOUR DOOR SEDAN	5.0	24.4	35.2	265.4	65.8	535.0	89.4	20.4
4476	2003 FORD CROWN VICTORIA FOUR DOOR SEDAN	5.0	25.3	35.3	289.4	69.4	603.6	94.1	19.7
	Average (AVG)				**267.4**	**61.8**	**580.5**	**83.9**	**18.9**
	Minimum (MIN)				**254.0**	**54.9**	**535.0**	**74.7**	**17.7**
	Maximum (MAX)				**289.4**	**69.4**	**603.6**	**94.1**	**20.4**
	Standard Deviation (STDev-sample)				**15.4**	**7.0**	**31.1**	**9.3**	**1.3**
	Number of Tests (n)			**4**					

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: 1G8ZK5275VZ133777

Model:	1997 Saturn SL2 Sedan Auto 4 Door Sedan
Engine Size:	1.9 L/ 116 cu.in.
Engine Description:	In-line 4 cylinder with Double Overhead Cam
Horse Power:	124 @ 5600 rpm
Torque:	122 lb-ft at 4800 rpm
Injection System:	Multi-Port Fuel Injection (MFI)
PSI:	31-44 psi
Ignition:	Electronic
Manufacturer:	Saturn
Assembly Plant:	Spring Hill, TN.
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Manual Seatbelts + Driver & Passenger Air Bags

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

The Fourth and Fifth characters (ZK) indicate a SL2 Sedan Auto

The Sixth character (5) indicates a 4 Door Sedan

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

The Eighth character (7) indicates the OEM engine: 1.9 L/ 116 cu.in., L4, DOHC

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

The Tenth character (V) indicates the model year 1997

The Eleventh character (Z) indicates the vehicle was made in the assembly plant in Spring Hill, TN.

The Twelfth through Seventeenth characters (133777) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

PROVIDED BY:

4N6XPRT Systems

8387 University Avenue

La Mesa CA 91942

5/9/2012

1997 SATURN SL2 4 DOOR SEDAN

Curb Weight:		2421	lbs.	1098	kg.
Curb Weight Distribution -	Front:	61	% Rear:	39	%
Gross Vehicle Weight Rating:		3344	lbs.	1517	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		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:	67	5.58	1.70
Front Track:	57	4.75	1.45
Rear Track:	56	4.67	1.42
Vertical Dimensions			
Height:	55	4.58	1.40
Ground to -			
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

1997 SATURN SL2 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	53	4.42	1.35
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	41	3.42	1.04
Rear Seat Shoulder Width	53	4.42	1.35
Rear Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (min)	26	2.17	0.66

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data			
Turning Circle (Diameter)	480	40.00	12.19
Steering Ratio:	:1		
Wheel Radius:	12	1.00	0.30
Tire Size (OEM):	185/65R15		

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 pavement):
d = 142.0 ft t = 3.2 sec a = -27.2 ft/sec² G-force = -0.85

Acceleration:

0 to 30mph	t =	2.6	sec	a =	16.9	ft/sec²	G-force = 0.53
0 to 60mph	t =	7.6	sec	a =	11.6	ft/sec²	G-force = 0.36
45 to 65mph	t =		sec	a =		ft/sec²	G-force =

Transmission Type: 4spd AUTOMATIC

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 5 mph

N.S.D.C = 1996 - 1999

1997 SATURN SL2 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.31	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	39.78
Inches in front of rear axle	=	62.22
Inches from side of vehicle	=	33.50
Inches from ground	=	21.59
Inches from front corner	=	83.77
Inches from rear corner	=	105.67
Inches from front bumper	=	76.78
Inches from rear bumper	=	100.22

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	1287.63	lb*ft*sec²
Pitch Moment of Inertia	=	1247.79	lb*ft*sec²
Roll Moment of Inertia	=	285.78	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	45.0	deg
Angle Front of Hood to Windshield Base	=	12.7	deg
Angle Front of Hood to Windshield Top	=	20.8	deg
Angle of Windshield	=	30.1	deg
Angle of Steering Tires at Max Turn	=	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 (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

Derived from

NHTSA Crash Test

#3446

2000 SATURN SL2

Provided By

4N6XPRT StifCalcs®

Registered to:

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

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: **1997 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	SATURN	SL		102.4
Remarks: SL, SL1, SL2 - new body panels in 97				
1996 - 2001	SATURN	SW		102.4
Remarks: SW1, SW2				
1997 - 2002	SATURN	SC	2D	102.4
Remarks: SC1, SC2				

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 #	3446	NHTSA Test Reference Guide Version #	V5			
Test Date	2000-07-24	Contract #	99999999999999999			
Contract/Study Title	NCAP SIDE IMPACT - 2000 SATURN SL2 4 DOOR					
Test Objective(s)	VEHICLE CRASHWORTHINES AND OCCUPANT PROTECTION					
Test Type	OPTIONAL NEW CAR ASSESSMENT TEST	Configuration	IMPACTOR INTO VEHICLE			
Impact Angle	270	Side Impact Point	N/A	mm	N/A	inches
		Offset Distance	0	mm	0.0	inches
		Closing Speed	62.6	Km/Hr	38.90	MPH
Test Performer	MGA RESEARCH					
Test Reference #	BT00072401					
Test Track Surface	CONCRETE	Condition	DRY			
Ambient Temperature	22 C	71.6 F	Total Number of Curves	49		
Data Recorder Type	OTHER	Data Link	UMBILICAL CABLE			
Test Commentary	HIGH SPEED ANALOG TO DIGITAL RECORDER					

Fixed Barrier Information

Barrier Type		Pole Barrier Diameter		mm	inches
Barrier Shape					
Barrier Commentary					

2000 SATURN SL2 LEFT FRONT SEAT OCCUPANT

Test #	3446						
Vehicle #	2		Sex	MALE			
Location	LEFT FRONT SEAT		Age	99			
Position	CENTER POSITION		Height	999	mm	39.3	inches
Type	NHTSA SIDE IMPACT DUMMY		Weight	999.0	kg	2202	pounds
Size	50 PERCENTILE						

Calibration Method	SIDE IMPACT DUMMY
Occupant Manufacturer	FIRST TECHNOLOGIES S/N: 269
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	HEAD CONTACTED D RING

Head

Head to -

Windshielder Header	375	mm	14.8	inches	Head Injury Criteria (HIC)	440		
WindShield	681	mm	26.8	inches	HIC Lower Time Interval (ms)	37.6		
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	73.6		
Side Header	192	mm	7.6	inches				
Side Window	335	mm	13.2	inches				

Neck to Seatback 9999 mm 0.0 inches

First Contact Region (Head)	SIDE WINDOW
Second Contact Region (Head)	

Chest

Chest to -

Dash	495	mm	19.5	inches	Arm to Door	70	mm	2.8	inches
Steering Wheel	334	mm	13.1	inches	Hip to Door	136	mm	5.4	inches
Seatback	9999	mm	0.0	inches					

Chest Severity Index	9999	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	999.9

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)	NONE
Second Contact Region (Chest/Abdomen)	NONE

Legs

Knees to Dash	229	mm	9.0	inches	Knees to Seatback	9999	mm	0.0	inches

Left Femur Peak Load	-999	Newtons	-224.6	pounds Force
Right Femur Peak Load	-999	Newtons	-224.6	pounds Force

First Contact Region (Legs)	OTHER
Second Contact Region (Legs)	

2000 SATURN SL2 LEFT FRONT SEAT OCCUPANT

Test #	3446					
Vehicle #	2	Sex	MALE			
Location	LEFT FRONT SEAT	Age	99			
Position	CENTER POSITION	Height	999	mm	39.3	inches
Type	NHTSA SIDE IMPACT DUMMY	Weight	999.0	kg	2202	pounds
Size	50 PERCENTILE					

Calibration Method	SIDE IMPACT DUMMY
Occupant Manufacturer	FIRST TECHNOLOGIES S/N: 269
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	HEAD CONTACTED D RING

Restraints

Restraint # 1	3 POINT BELT
Mounted	OTHER
Deployment	NOT APPLICABLE
Restraint Commentary	
Restraint # 2	FRONTAL AIRBAG
Mounted	DASH PANEL - UNSPECIFIED
Deployment	DEPLOYED PROPERLY
Restraint Commentary	

2000 SATURN SL2 LEFT REAR SEAT OCCUPANT

Test #	3446		
Vehicle #	2	Sex	MALE
Location	LEFT REAR SEAT	Age	99
Position	CENTER POSITION	Height	999 mm 39.3 inches
Type	NHTSA SIDE IMPACT DUMMY	Weight	999.0 kg 2202 pounds
Size	50 PERCENTILE		
Calibration Method	SIDE IMPACT DUMMY		
Occupant Manufacturer	FIRST TECHNOLOGIES S/N: 270		
Occupant Modification	NO COMMENTS		
Occupant Description	NO COMMENTS		
Occupant Commentary	NO COMMENTS		

Head

Head to -

Windshielder Header	9999	mm	0.0	inches	Head Injury Criteria (HIC)	997	
WindShield	9999	mm	0.0	inches	HIC Lower Time Interval (ms)	49.7	
Seatback	547	mm	21.5	inches	HIC Upper Time Interval (ms)	58.6	
Side Header	204	mm	8.0	inches			
Side Window	311	mm	12.2	inches			

Neck to Seatback 9999 mm 0.0 inches

First Contact Region (Head): C PILLAR

Second Contact Region (Head):

Chest

Chest to -

Dash	9999	mm	0.0	inches	Arm to Door	98	mm	3.9	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	152	mm	6.0	inches
Seatback	472	mm	18.6	inches					

Chest Severity Index	9999	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	999.9

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): NONE

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash 9999 mm 0.0 inches Knees to Seatback 160 mm 6.3 inches

Left Femur Peak Load -999 Newtons -224.6 pounds Force

Right Femur Peak Load -999 Newtons -224.6 pounds Force

First Contact Region (Legs): OTHER

Second Contact Region (Legs):

2000 SATURN SL2 LEFT REAR SEAT OCCUPANT

Test #	3446					
Vehicle #	2	Sex	MALE			
Location	LEFT REAR SEAT	Age	99			
Position	CENTER POSITION	Height	999	mm	39.3	inches
Type	NHTSA SIDE IMPACT DUMMY	Weight	999.0	kg	2202	pounds
Size	50 PERCENTILE					

Calibration Method	SIDE IMPACT DUMMY
Occupant Manufacturer	FIRST TECHNOLOGIES S/N: 270
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	NO COMMENTS

Restraints

Restraint # 1	3 POINT BELT
Mounted	OTHER
Deployment	NOT APPLICABLE
Restraint Commentary	
Restraint # 2	NONE
Mounted	NOT APPLICABLE
Deployment	NOT APPLICABLE
Restraint Commentary	

Vehicle 1 0 NHTSA DEFORMABLE IMPACTOR

Test #	3446		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	99 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description	FMVSS 214 DEFORMABLE BARRIER AND IMPACTOR		
Vehicle Commentary	FMVSS 214 MOVING BARRIER		

Vehicle Length	4115	mm	162.0	inches	CG behind Front Axle	1098	mm	43.2	inches
Vehicle Width	1252	mm	49.3	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2591	mm	102.0	inches	Total Length of Indentation	99999	mm	0.0	inches
Vehicle Test Weight	1364	KG	3006	pounds	Maximum Static Crush Depth	9999	mm	0.0	inches
					Pre-Impact Speed	63	kph	38.9	mph

Vehicle Damage Index: 9999999 — Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	9999	mm	0.0	inches
DPD 2	9999	mm	0.0	inches
DPD 3	9999	mm	0.0	inches
DPD 4	9999	mm	0.0	inches
DPD 5	9999	mm	0.0	inches
DPD 6	9999	mm	0.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	99999	mm	99999	mm	0	mm
Centerline	0.0	inches	0.0	inches	0.0	inches
	99999	mm	99999	mm	0	mm
Right Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	99999	mm	99999	mm	0	mm

Bumper Engagement (Inline Impact Only): 99.0

Sill Engagement (Side Impact Only): NOT APPLICABLE

A-pillar Engagement (Side Impact Only): 9.0

Moving Test Cart Angle: NOT APPLICABLE

Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground

Moving Test Cart/Vehicle Crabbed Angle: 27.0

Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle

Vehicle Orientation on Cart Moving Test Cart: NOT APPLICABLE

Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion

Vehicle 1 0 NHTSA DEFORMABLE IMPACTOR

Test #	3446		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	99 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description	FMVSS 214 DEFORMABLE BARRIER AND IMPACTOR		
Vehicle Commentary	FMVSS 214 MOVING BARRIER		

Vehicle Length	4115	mm	162.0	inches	CG behind Front Axle	1098	mm	43.2	inches
Vehicle Width	1252	mm	49.3	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2591	mm	102.0	inches	Total Length of Indentation	99999	mm	0.0	inches
Vehicle Test Weight	1364	KG	3006	pounds	Maximum Static Crush Depth	9999	mm	0.0	inches
					Pre-Impact Speed	63	kph	38.9	mph

Vehicle Damage Index	9999999	Principal Direction of Force	0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				99999	0.0	99999	0.0				
				Engine Block							
				99999	0.0	99999	0.0				
99999	0.0	99999	0.0	Front Bumper Corner				99999	0.0	99999	0.0
				Front of Engine							
				99999	0.0	99999	0.0				
99999	0.0	99999	0.0	Firewall				99999	0.0	99999	0.0
				99999	0.0	99999	0.0				
99999	0.0	99999	0.0	Upper Leading Edge of Door				99999	0.0	99999	0.0
99999	0.0	99999	0.0	Lower Leading Edge of Door				99999	0.0	99999	0.0
99999	0.0	99999	0.0	Bottom of 'A' Post				99999	0.0	99999	0.0
99999	0.0	99999	0.0	Upper Trailing Edge of Door				99999	0.0	99999	0.0
99999	0.0	99999	0.0	Lower Trailing Edge of Door				99999	0.0	99999	0.0
				Steering Column							
				99999	0.0	99999	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				99999	0.0	99999	0.0				
				Center of Steering Column to Headliner (Vertical)							
				99999	0.0	99999	0.0				

Vehicle 2 2000 SATURN SL2

Test #	3446		
VIN	1G8ZJ5273YZ239393	NHTSA Test Vehicle Number	2
Year	2000	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	SATURN	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	SL2	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	NO COMMENTS		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	4542	mm	178.8	inches	CG behind Front Axle	1138 mm	44.8 inches
Vehicle Width	1674	mm	65.9	inches	Center of Damage to CG Axis	163 mm	6.4 inches
Vehicle Wheelbase	2596	mm	102.2	inches	Total Length of Indentation	3710 mm	146.1 inches
Vehicle Test Weight	1292	KG	2848	pounds	Maximum Static Crush Depth	381 mm	15.0 inches
					Pre-Impact Speed	0 kph	0.0 mph

Vehicle Damage Index: 03LPAW2

Principal Direction of Force: 297

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	0	mm	0.0	inches
DPD 2	-21	mm	-0.8	inches
DPD 3	370	mm	14.6	inches
DPD 4	380	mm	15.0	inches
DPD 5	-4	mm	-0.2	inches
DPD 6	0	mm	0.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	162.6	inches	160.0	inches	2.5	inches
	4129	mm	4065	mm	64	mm
Centerline	178.8	inches	177.4	inches	1.4	inches
	4542	mm	4506	mm	36	mm
Right Bumper Corner	162.5	inches	158.7	inches	3.9	inches
	4128	mm	4030	mm	98	mm

Bumper Engagement (Inline Impact Only): 27.0

Sill Engagement (Side Impact Only): DIRECT ENGAGEMENT

A-pillar Engagement (Side Impact Only): 90.0

Moving Test Cart Angle: NOT APPLICABLE

Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground

Moving Test Cart/Vehicle Crabbed Angle: 0.0

Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle

Vehicle Orientation on Cart Moving Test Cart: DIRECT ENGAGEMENT

Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion

Vehicle 2 2000 SATURN SL2

Test #	3446		
VIN	1G8ZJ5273YZ239393	NHTSA Test Vehicle Number	2
Year	2000	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	SATURN	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	SL2	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	NO COMMENTS		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	4542	mm	178.8	inches	CG behind Front Axle	1138	mm	44.8	inches
Vehicle Width	1674	mm	65.9	inches	Center of Damage to CG Axis	163	mm	6.4	inches
Vehicle Wheelbase	2596	mm	102.2	inches	Total Length of Indentation	3710	mm	146.1	inches
Vehicle Test Weight	1292	KG	2848	pounds	Maximum Static Crush Depth	381	mm	15.0	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index	03LPAW2	Principal Direction of Force	297

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				4542	178.8	4506	177.4				
				Engine Block							
				99999	0.0	99999	0.0				
4129	162.6	4065	160.0	Front Bumper Corner				4128	162.5	4030	158.7
				Front of Engine							
				99999	0.0	99999	0.0				
99999	0.0	99999	0.0	Firewall				99999	0.0	99999	0.0
				99999	0.0	99999	0.0				
99999	0.0	99999	0.0	Upper Leading Edge of Door				99999	0.0	99999	0.0
99999	0.0	99999	0.0	Lower Leading Edge of Door				99999	0.0	99999	0.0
99999	0.0	99999	0.0	Bottom of 'A' Post				99999	0.0	99999	0.0
99999	0.0	99999	0.0	Upper Trailing Edge of Door				99999	0.0	99999	0.0
99999	0.0	99999	0.0	Lower Trailing Edge of Door				99999	0.0	99999	0.0
				Steering Column							
				99999	0.0	99999	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				99999	0.0	99999	0.0				
				Center of Steering Column to Headliner (Vertical)							
				99999	0.0	99999	0.0				

2000 SATURN SL2

NHTSA Crash Test - #3446 - Side Impact

Damage Profile Distances - Indention Length - KE Equivalent Speed - Trapezoidal Average

Test Vehicle Weight =	2848 pounds	Impactor Weight =	3006
KE Equivalent Speed =	27.9 MPH	Impactor Test Speed =	38.9
Test Crush Length =	146.1 inches		

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Rear)	0.0	-0.8	14.6	15.0	-0.2	0.0	(Front)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 14.6 inches					57.0
Using a Rated No Damage Speed of	1.0mph	28.8	53.0	7.8	
Using a Rated No Damage Speed of	2.0mph	55.4	49.1	31.3	
Using a Rated No Damage Speed of	3.0mph	79.9	45.4	70.3	
Using a Rated No Damage Speed of	5.0mph	122.4	38.4	195.4	
Average Crush = 9.8 inches					126.5
Using a Rated No Damage Speed of	1.0mph	42.9	117.5	7.8	
Using a Rated No Damage Speed of	2.0mph	82.5	109.0	31.3	
Using a Rated No Damage Speed of	3.0mph	119.0	100.7	70.3	
Using a Rated No Damage Speed of	5.0mph	182.4	85.2	152.7	
Maximum Crush = 15.0 inches					54.0
Using a Rated No Damage Speed of	1.0mph	28.0	50.2	7.8	
Using a Rated No Damage Speed of	2.0mph	53.9	46.5	31.3	
Using a Rated No Damage Speed of	3.0mph	77.8	43.0	70.3	
Using a Rated No Damage Speed of	5.0mph	119.2	36.3	195.4	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	15.0	28.1	0.2	0.7

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 20.7

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

Available Test Results
Side Impact Test Summary

Report Filter Settings

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

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
2506	1997 SATURN SL2 FOUR DOOR SEDAN	2.0	15.6	27.5	51.6	42.3	31.5	49.2	19.5
3446	2000 SATURN SL2 FOUR DOOR SEDAN	2.0	9.8	27.9	82.2	108.0	31.3	125.4	31.6
3307	2000 SATURN SL1 FOUR DOOR SEDAN	2.0	3.3	20.7	170.9	489.2	29.9	599.3	52.5
	Average (AVG)				**101.6**	**213.2**	**30.9**	**258.0**	**34.5**
	Minimum (MIN)				**51.6**	**42.3**	**29.9**	**49.2**	**19.5**
	Maximum (MAX)				**170.9**	**489.2**	**31.5**	**599.3**	**52.5**
	Standard Deviation (STDev-sample)				**62.0**	**241.3**	**0.9**	**298.0**	**16.7**
	Number of Tests (n)			**3**					

Available Test Results
Side Impact Test Summary

Report Filter Settings

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

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
2506	1997 SATURN SL2 FOUR DOOR SEDAN	2.0	15.6	27.5	51.6	42.3	31.5	49.2	19.5
3446	2000 SATURN SL2 FOUR DOOR SEDAN	2.0	15.0	27.9	53.9	46.5	31.3	54.0	20.7
3307	2000 SATURN SL1 FOUR DOOR SEDAN	2.0	10.1	20.7	55.5	51.6	29.9	63.1	17.1
	Average (AVG)				**53.7**	**46.8**	**30.9**	**55.4**	**19.1**
	Minimum (MIN)				**51.6**	**42.3**	**29.9**	**49.2**	**17.1**
	Maximum (MAX)				**55.5**	**51.6**	**31.5**	**63.1**	**20.7**
	Standard Deviation (STDev-sample)				**2.0**	**4.7**	**0.9**	**7.1**	**1.8**
	Number of Tests (n)			**3**					

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: KNADC125236241385

Model:	2003 Kia Rio 4-Door Sedan
Engine Size:	1.6L / 97 cu.in.
Engine Description:	Inline 4 cylinder with Dual Overhear Cams
Horse Power:	104 @ 5800 rpm
Torque:	104 lb-ft at 4700 rpm
Injection System:	Electronic Gasoline Injection (EGI)
PSI:	65-94 psi
Ignition:	electronic
Manufacturer:	Kia
Assembly Plant:	Sohari, Korea
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Dual Air Bags

The First through Third characters (KNA) indicate a Kia Car made in Korea

The Fourth and Fifth characters (DC) indicate a Rio

The Sixth and Seventh characters (12) indicate a 4-Door Sedan

The Eighth character (5) indicates the OEM engine: 1.6L / 97 cu.in., L4,DOHC

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

The Tenth character (3) indicates the model year 2003

The Eleventh character (6) indicates the vehicle was made in the assembly plant in Sohari, Korea

The Twelfth through Seventeenth characters (241385) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

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

5/29/2012

2003 KIA RIO 4 DOOR SEDAN

Curb Weight:		2403	lbs.	1090	kg.
Curb Weight Distribution -	Front:	56	% Rear:	44	%
Gross Vehicle Weight Rating:		3379	lbs.	1533	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	167	13.92	4.24
Wheelbase:	95	7.92	2.41
Front Bumper to Front Axle:	33	2.75	0.84
Front Bumper to Front of Front Well:	19	1.58	0.48
Front Bumper to Front of Hood:	5	0.42	0.13
Front Bumper to Base of Windshield:	42	3.50	1.07
Front Bumper to Top of Windshield:	70	5.83	1.78
Rear Bumper to Rear Axle:	39	3.25	0.99
Rear Bumper to Rear of Rear Well:	24	2.00	0.61
Rear Bumper to Rear of Trunk:	4	0.33	0.10
Rear Bumper to Base of Rear Window:	20	1.67	0.51
Width Dimensions			
Maximum Width:	66	5.50	1.68
Front Track:	56	4.67	1.42
Rear Track:	57	4.75	1.45
Vertical Dimensions			
Height:	57	4.75	1.45
Ground to -			
Front Bumper (Top)	22	1.83	0.56
Headlight - center	26	2.17	0.66
Hood - top front:	30	2.50	0.76
Base of Windshield	37	3.08	0.94
Rear Bumper - top:	24	2.00	0.61
Trunk - top rear:	39	3.25	0.99
Base of Rear Window:	42	3.50	1.07

2003 KIA RIO 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	53	4.42	1.35
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	43	3.58	1.09
Rear Seat Shoulder Width	53	4.42	1.35
Rear Seat to Headliner	38	3.17	0.97
Front Leg Room - seatback to floor (min)	33	2.75	0.84

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	372	31.00	9.45
Steering Ratio:	:1		
Wheel Radius:	11	0.92	0.28
Tire Size (OEM):	P175/65R14		

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 pavement):
d = 129.0 ft t = 2.9 sec a = -30.0 ft/sec² G-force = -0.93

Acceleration:

0 to 30mph	t =	3.1	sec	a =	14.2	ft/sec²	G-force = 0.44
0 to 60mph	t =	9.8	sec	a =	9.0	ft/sec²	G-force = 0.28
45 to 65mph	t =	5.5	sec	a =	5.3	ft/sec²	G-force = 0.17

Transmission Type: 5spd MANUAL

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2003 - 2005

2003 KIA RIO 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.26	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	41.80
Inches in front of rear axle	=	53.20
Inches from side of vehicle	=	33.00
Inches from ground	=	22.37
Inches from front corner	=	81.76
Inches from rear corner	=	97.93
Inches from front bumper	=	74.80
Inches from rear bumper	=	92.20

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	1269.09	lb*ft*sec²
Pitch Moment of Inertia	=	1229.97	lb*ft*sec²
Roll Moment of Inertia	=	282.54	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	58.0	deg
Angle Front of Hood to Windshield Base	=	10.7	deg
Angle Front of Hood to Windshield Top	=	21.0	deg
Angle of Windshield	=	32.7	deg
Angle of Steering Tires at Max Turn	=	29.3	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 (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).

4N6XPRT StifCalcs - Selected Vehicle: 2003 KIA RIO

File Print Reports Settings Help Reg To: 4N6XPRT SYSTEMS StifCalcs Version: 3.1.1.13

Basic Vehicle Search | NHTSA Test Selection | Advanced Vehicle Search | Force Balance | NHTSA Download

Available Test | Test Information | Occupant Information | Vehicle Information | Stiffness Calcs

Available Tests in the NHTSA database for a 2003 - 2005 KIA RIO

Sister Clone Searched Year Range (2003 - 2005)

Frontal Test(s)

No Front Tests: 2003 - 2005

Rear Test(s)

No Rear Tests: 2003 - 2005

Print

Side Test(s)

Test No.	Year	Make	Model	Impact Speed	Max Crush	Crush Factor	VDI	PDOF	Test Config	VIN
4557	2003	KIA	RIO	38.5	10.7	55.4		297	IMPACTOR IN...	KNADC1250362...

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 1965 - 2012
Model: RIO

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
3905	2002 KIA RIO FOUR DOOR SEDAN	5.0	17.1	34.6	305.6	105.9	440.8	144.8	28.0
7751	2012 KIA RIO FOUR DOOR SEDAN	5.0	17.4	34.9	309.8	106.2	452.0	144.7	27.9
5912	2007 KIA RIO FOUR DOOR SEDAN	5.0	13.8	34.8	386.4	166.9	447.2	227.6	35.1
5495	2006 KIA RIO FOUR DOOR SEDAN	5.0	12.3	35.1	437.2	213.9	446.8	290.8	40.1
	Average (AVG)				**359.8**	**148.2**	**446.7**	**202.0**	**32.8**
	Minimum (MIN)				**305.6**	**105.9**	**440.8**	**144.7**	**27.9**
	Maximum (MAX)				**437.2**	**213.9**	**452.0**	**290.8**	**40.1**
	Standard Deviation (STDev-sample)				**63.6**	**52.3**	**4.6**	**70.9**	**5.9**
	Number of Tests (n)			**4**					

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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 Yaris was used, with the Stiffness Values from the range of tests for the Kia Rio as the “Known Good” values.

In this set of tests, the Kis Rio stiffness values based on AVERAGE crush were used.

2003 KIA RIO - Front Impact

Curb Weight (pounds):	2375
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	2375
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	7.24
Damage Length (inches):	66.0
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	1240.25

"Known" Stifness Values

	A	B
Average	359.8	148.2
Minimum	305.6	105.9
Maximum	437.2	213.9
Std. Devation	63.6	52.3

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	15.72	13.20	176.62	6.76	1193.61	6.22	1097.71
C2 (inches)	11.04	13.20	151.27	5.73	867.18	19.88	3007.38
C3 (inches)	11.88	13.20	106.13	4.33	459.07	31.95	3390.71
C4 (inches)	4.20	13.20	35.64	1.49	53.06	44.98	1603.01
C5 (inches)	1.20	13.20	7.92	0.40	3.17	57.20	453.02
C6 (inches)	0.00						
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 7.24

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	305.6	105.9	35372.45	37321.45	21.7	26.4	53.9
Avg - 2 Std. Deviations	232.6	43.6	18086.96	22029.26	16.7	19.8	40.4
Avg - 1 Std. Deviations	296.2	95.9	32674.37	34891.27	21.0	25.5	52.1
Average	359.8	148.2	47261.78	48536.23	24.8	30.1	61.6
Avg + 1 Std. Deviations	423.4	200.5	61849.19	62351.44	28.1	34.2	69.8
Avg + 2 Std. Deviations	487.0	252.8	76436.61	76231.24	31.0	37.7	77.1
Maximum	437.2	213.9	65504.35	65775.94	28.8	35.1	71.7

Damage Centroid Depth (x) (inches)	5.39	k^2	2421.39
Damage Centroid Depth (y) (inches)	20.00	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	477.58		

2007 TOYOTA YARIS - Front Impact

Curb Weight (pounds):	2275
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	2275
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	21.35
Damage Length (inches):	66.0
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	1137.25

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	19.20	13.20	253.44	9.60	2433.02	6.60	1672.70
C2 (inches)	19.20	13.20	261.36	9.90	2588.26	19.87	5192.35
C3 (inches)	20.40	13.20	269.28	10.20	2746.66	33.00	8886.24
C4 (inches)	20.40	13.20	285.12	10.81	3082.46	46.32	13207.39
C5 (inches)	22.80	13.20	339.90	12.93	4395.36	59.65	20275.73
C6 (inches)	28.70						
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 21.35

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	170.8	42.2	35372.45	75581.65	31.6	27.5	21.7
Avg - 2 Std. Deviations	118.0	20.1	18086.96	41352.80	23.4	20.6	15.0
Avg - 1 Std. Deviations	163.6	38.7	32674.37	70298.23	30.4	26.6	20.8
Average	199.8	57.7	47261.78	98698.13	36.1	31.5	25.4
Avg + 1 Std. Deviations	230.7	77.0	61849.19	126794.31	40.9	35.7	29.4
Avg + 2 Std. Deviations	258.2	96.4	76436.61	154689.81	45.2	39.4	32.9
Maximum	237.9	81.8	65504.35	133800.22	42.0	36.6	30.3

Damage Centroid Depth (x) (inches)	10.82	k^2	2317.89
Damage Centroid Depth (y) (inches)	34.94	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	1409.10		

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 1965 - 2012
Model: RIO

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
7751	2012 KIA RIO FOUR DOOR SEDAN	5.0	20.0	34.9	270.5	80.9	452.0	110.3	24.4
3905	2002 KIA RIO FOUR DOOR SEDAN	5.0	18.9	34.6	275.7	86.2	440.8	117.8	25.3
5912	2007 KIA RIO FOUR DOOR SEDAN	5.0	14.8	34.8	359.2	144.3	447.2	196.7	32.6
5495	2006 KIA RIO FOUR DOOR SEDAN	5.0	14.5	35.1	370.4	153.5	446.8	208.7	33.9
	Average (AVG)				**319.0**	**116.2**	**446.7**	**158.4**	**29.1**
	Minimum (MIN)				**270.5**	**80.9**	**440.8**	**110.3**	**24.4**
	Maximum (MAX)				**370.4**	**153.5**	**452.0**	**208.7**	**33.9**
	Standard Deviation (STDev-sample)				**53.2**	**38.0**	**4.6**	**51.5**	**4.9**
	Number of Tests (n)			**4**					

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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 Yaris was used, with the Stiffness Values from the range of tests for the Kia Rio as the “Known Good” values.

In this set of tests, the Kis Rio stiffness values based on MAXIMUM crush were used.

2003 KIA RIO - Front Impact

Curb Weight (pounds):	2375
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	2375
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	7.24
Damage Length (inches):	66.0
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	1240.25

"Known" Stifness Values

	A	B
Average	319.0	116.2
Minimum	270.5	80.9
Maximum	370.4	153.5
Std. Devation	53.2	38.0

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	15.72	13.20	176.62	6.76	1193.61	6.22	1097.71
C2 (inches)	11.04	13.20	151.27	5.73	867.18	19.88	3007.38
C3 (inches)	11.88	13.20	106.13	4.33	459.07	31.95	3390.71
C4 (inches)	4.20	13.20	35.64	1.49	53.06	44.98	1603.01
C5 (inches)	1.20	13.20	7.92	0.40	3.17	57.20	453.02
C6 (inches)	0.00						
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 7.24

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	270.5	80.9	28244.45	30619.75	19.7	23.8	48.7
Avg - 2 Std. Deviations	212.6	40.2	16615.08	20182.91	16.0	19.0	38.8
Avg - 1 Std. Deviations	265.8	78.2	27444.62	29850.32	19.4	23.5	48.1
Average	319.0	116.2	38274.17	40048.99	22.5	27.4	55.9
Avg + 1 Std. Deviations	372.2	154.2	49103.71	50386.18	25.2	30.7	62.7
Avg + 2 Std. Deviations	425.4	192.2	59933.25	60779.71	27.7	33.7	68.8
Maximum	370.4	153.5	48877.16	50151.59	25.2	30.6	62.6

Damage Centroid Depth (x) (inches)	5.39	k^2	2421.39
Damage Centroid Depth (y) (inches)	20.00	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	477.58		

2007 TOYOTA YARIS - Front Impact

Curb Weight (pounds):	2275
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	2275
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	21.35
Damage Length (inches):	66.0
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	1137.25

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	19.20	13.20	253.44	9.60	2433.02	6.60	1672.70
C2 (inches)	19.20	13.20	261.36	9.90	2588.26	19.87	5192.35
C3 (inches)	20.40	13.20	269.28	10.20	2746.66	33.00	8886.24
C4 (inches)	20.40	13.20	285.12	10.81	3082.46	46.32	13207.39
C5 (inches)	22.80	13.20	339.90	12.93	4395.36	59.65	20275.73
C6 (inches)	28.70						
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 21.35

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	151.1	33.0	28244.45	61584.45	28.5	24.9	19.2
Avg - 2 Std. Deviations	112.5	18.3	16615.08	38380.42	22.5	19.8	14.3
Avg - 1 Std. Deviations	148.7	32.0	27444.62	60005.29	28.1	24.6	18.9
Average	178.3	46.0	38274.17	81246.52	32.7	28.6	22.7
Avg + 1 Std. Deviations	203.9	60.1	49103.71	102259.68	36.7	32.0	26.0
Avg + 2 Std. Deviations	226.9	74.4	59933.25	123117.11	40.3	35.2	28.9
Maximum	203.4	59.8	48877.16	101821.86	36.6	32.0	25.9

Damage Centroid Depth (x) (inches)	10.82	k^2	2317.89
Damage Centroid Depth (y) (inches)	34.94	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	1409.10		

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: JTDBT923071053555

Model:	2007 Toyota Yaris 4-Door Sedan
Engine Size:	1.5L / 91cu.in.
Engine Description:	In-line 4 Cylinder with Dual Overhead Cam
Horse Power:	108 @ 5999 rpm
Torque:	105 lb-ft @ 3999 rpm
Injection System:	Electronic Fuel Injection (EFI)
PSI:	44-50 psi
Ignition:	electronic
Manufacturer:	Toyota
Assembly Plant:	Toyota, Japan
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Dual Front Air Bags

The First through Third characters (JTD) indicate a Toyota Car made in Japan

The Fourth character (B) indicates a 4-Door Sedan

The Fifth character (T) indicates the OEM engine: 1.5L / 91cu.in., L4,DOHC

The Sixth and Eighth characters (93) indicate a Yaris

The Seventh character (2) indicates Dual Front Air Bags

The Ninth character (the check digit) is entered as 0.
The VIN appears Valid, the calculated value is 0.

The Tenth character (7) indicates the model year 2007

The Eleventh character (1) indicates the vehicle was made in the assembly plant in Toyota, Japan

The Twelfth through Seventeenth characters (053555) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

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

5/29/2012

2007 TOYOTA YARIS 4 DOOR SEDAN

Curb Weight:		2309	lbs.	1047	kg.
Curb Weight Distribution -	Front:	61	% Rear:	39	%
Gross Vehicle Weight Rating:		3300	lbs.	1497	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	169	14.08	4.29
Wheelbase:	100	8.33	2.54
Front Bumper to Front Axle:	31	2.58	0.79
Front Bumper to Front of Front Well:	17	1.42	0.43
Front Bumper to Front of Hood:	7	0.58	0.18
Front Bumper to Base of Windshield:	36	3.00	0.91
Front Bumper to Top of Windshield:	66	5.50	1.68
Rear Bumper to Rear Axle:	38	3.17	0.97
Rear Bumper to Rear of Rear Well:	23	1.92	0.58
Rear Bumper to Rear of Trunk:	6	0.50	0.15
Rear Bumper to Base of Rear Window:	18	1.50	0.46
Width Dimensions			
Maximum Width:	67	5.58	1.70
Front Track:	58	4.83	1.47
Rear Track:	58	4.83	1.47
Vertical Dimensions			
Height:	57	4.75	1.45
Ground to -			
Front Bumper (Top)	22	1.83	0.56
Headlight - center	29	2.42	0.74
Hood - top front:	33	2.75	0.84
Base of Windshield	39	3.25	0.99
Rear Bumper - top:	24	2.00	0.61
Trunk - top rear:	42	3.50	1.07
Base of Rear Window:	44	3.67	1.12

2007 TOYOTA YARIS 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	52	4.33	1.32
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	42	3.50	1.07
Rear Seat Shoulder Width	50	4.17	1.27
Rear Seat to Headliner	37	3.08	0.94
Front Leg Room - seatback to floor (min)	36	3.00	0.91

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	396	33.00	10.06
Steering Ratio:	19.70:1		
Wheel Radius:			
Tire Size (OEM):	P175/65R14		

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 pavement):
d = 125.0 ft t = 2.8 sec a = -30.9 ft/sec² G-force = -0.96

Acceleration:

0 to 30mph	t =	3.3	sec	a =	13.3	ft/sec²	G-force = 0.41
0 to 60mph	t =	10.4	sec	a =	8.5	ft/sec²	G-force = 0.26
45 to 65mph	t =	5.6	sec	a =	5.2	ft/sec²	G-force = 0.16

Transmission Type: 5spd MANUAL

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 2007 - 2012

2007 TOYOTA YARIS 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.30	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	39.00
Inches in front of rear axle	=	61.00
Inches from side of vehicle	=	33.50
Inches from ground	=	22.37
Inches from front corner	=	77.60
Inches from rear corner	=	104.51
Inches from front bumper	=	70.00
Inches from rear bumper	=	99.00

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	1172.27	lb*ft*sec²
Pitch Moment of Inertia	=	1136.91	lb*ft*sec²
Roll Moment of Inertia	=	265.62	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	57.5	deg
Angle Front of Hood to Windshield Base	=	11.7	deg
Angle Front of Hood to Windshield Top	=	20.4	deg
Angle of Windshield	=	28.1	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:

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

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

Derived from

NHTSA Crash Test

#5677

2007 TOYOTA YARIS

Provided By

4N6XPRT StifCalcs®

Registered to:

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

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: **2007 TOYOTA YARIS 4D**

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

Year Range	Make	Model	Body Styles	Wheelbase
2006 - 2010	TOYOTA	YARIS 4D	4D	100.4

Remarks:

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 #	5677	NHTSA Test Reference Guide Version #	V5				
Test Date	2006-05-16	Contract #	DTNH22-01-D-12005				
Contract/Study Title	NCAP - 2007 TOYOTA YARIS						
Test Objective(s)	VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT PERFORMANCE DATA						
Test Type	NEW CAR ASSESSMENT TEST	Configuration	VEHICLE INTO BARRIER				
Impact Angle	0	Side Impact Point	0	mm	0.0	inches	
		Offset Distance	0	mm	0.0	inches	
		Closing Speed	56.3	Km/Hr	34.98	MPH	
Test Performer	MGA RESEARCH						
Test Reference #	BT06051601						
Test Track Surface	CONCRETE	Condition	DRY				
Ambient Temperature	21 C	69.8 F	Total Number of Curves	102			
Data Recorder Type	OTHER	Data Link	OTHER				
Test Commentary	DTS TDAS PRO ON BOARD DAS						

Fixed Barrier Information

Barrier Type	RIGID	Pole Barrier Diameter	0	mm	0	inches
Barrier Shape	LOAD CELL BARRIER					
Barrier Commentary						

2007 TOYOTA YARIS LEFT FRONT SEAT OCCUPANT

Test #	5677		
Vehicle #	1	Sex	MALE
Location	LEFT FRONT SEAT	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	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 066		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO HEADREST; KNEES TO BOLSTER; RIGHT KNEE TO STEERING COLUMN		

Head

Head to -

Windshielder Header	397	mm	15.6	inches	Head Injury Criteria (HIC)	427	
WindShield	653	mm	25.7	inches	HIC Lower Time Interval (ms)	62.5	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	98.5	
Side Header	202	mm	8.0	inches			
Side Window	302	mm	11.9	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	681	mm	26.8	inches	Arm to Door	100	mm	3.9	inches
Steering Wheel	352	mm	13.9	inches	Hip to Door	143	mm	5.6	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	45

Lap Belt Peak Load	6935	Newtons	1559.1	pound Force
Shoulder Belt Peak Load	3743	Newtons	841.5	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	139	mm	5.5	inches	Knees to Seatback	0	mm	0.0	inches

Left Femur Peak Load	-4893	Newtons	-1100.0	pounds Force
Right Femur Peak Load	-2829	Newtons	-636.0	pounds Force

First Contact Region (Legs): OTHER

Second Contact Region (Legs):

2007 TOYOTA YARIS LEFT FRONT SEAT OCCUPANT

Test #	5677					
Vehicle #	1	Sex	MALE			
Location	LEFT FRONT SEAT	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	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N 066
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST; KNEES TO BOLSTER; RIGHT KNEE TO STEERING COLUMN

Restraints

Restraint # 1	FRONTAL AIRBAG
Mounted	STEERING WHEEL
Deployment	DEPLOYED PROPERLY
Restraint Commentary	PRIMARY
Restraint # 2	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

2007 TOYOTA YARIS RIGHT FRONT SEAT OCCUPANT

Test #	5677		
Vehicle #	1	Sex	MALE
Location	RIGHT FRONT SEAT	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	HYBRID III		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 065		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO HEADREST; KNEES TO GLOVE BOX		

Head

Head to -

Windshielder Header	381 mm	15.0 inches	Head Injury Criteria (HIC)	485
WindShield	625 mm	24.6 inches	HIC Lower Time Interval (ms)	62.2
Seatback	0 mm	0.0 inches	HIC Upper Time Interval (ms)	91
Side Header	190 mm	7.5 inches		
Side Window	284 mm	11.2 inches		

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	573 mm	22.6 inches	Arm to Door	84 mm 3.3 inches
Steering Wheel	0 mm	0.0 inches	Hip to Door	136 mm 5.4 inches
Seatback	0 mm	0.0 inches		

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	48

Lap Belt Peak Load	9815 Newtons	2206.5	pound Force
Shoulder Belt Peak Load	4125 Newtons	927.3	pound Force

First Contact Region (Chest/Abdomen): AIR BAG

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash	170 mm	6.7 inches	Knees to Seatback	0 mm 0.0 inches
Left Femur Peak Load	-1715 Newtons	-385.5	pounds Force	
Right Femur Peak Load	-598 Newtons	-134.4	pounds Force	

First Contact Region (Legs): OTHER

Second Contact Region (Legs):

2007 TOYOTA YARIS RIGHT FRONT SEAT OCCUPANT

Test #	5677					
Vehicle #	1	Sex	MALE			
Location	RIGHT FRONT SEAT	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	HYBRID III
Occupant Manufacturer	FIRST TECHNOLOGY S/N 065
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO HEADREST; KNEES TO GLOVE BOX

Restraints

Restraint # 1	FRONTAL AIRBAG
Mounted	DASH PANEL - TOP
Deployment	DEPLOYED PROPERLY
Restraint Commentary	PRIMARY
Restraint # 2	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

Vehicle 1 2007 TOYOTA YARIS

Test #	5677		
VIN	JTDBT923471016797	NHTSA Test Vehicle Number	1
Year	2007	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	TOYOTA	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	YARIS	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	1.5 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary	VEHICLE MAKE: YARIS		

Vehicle Length	4265	mm	167.9	inches	CG behind Front Axle	1046	mm	41.2	inches
Vehicle Width	1695	mm	66.7	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2551	mm	100.4	inches	Total Length of Indentation	1518	mm	59.8	inches
Vehicle Test Weight	1271	KG	2801	pounds	Maximum Static Crush Depth	546	mm	21.5	inches
					Pre-Impact Speed	56	kph	35.0	mph

Vehicle Damage Index: 12FDEW6

Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	290	mm	11.4	inches
DPD 2	448	mm	17.6	inches
DPD 3	509	mm	20.0	inches
DPD 4	527	mm	20.7	inches
DPD 5	311	mm	12.2	inches
DPD 6	-12	mm	-0.5	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	158.9	inches	147.5	inches	11.4	inches
	4036	mm	3746	mm	290	mm
Centerline	167.9	inches	146.4	inches	21.5	inches
	4265	mm	3719	mm	546	mm
Right Bumper Corner	159.2	inches	146.9	inches	12.2	inches
	4043	mm	3732	mm	311	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 2007 TOYOTA YARIS

Test #	5677		
VIN	JTDBT923471016797	NHTSA Test Vehicle Number	1
Year	2007	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	TOYOTA	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	YARIS	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	1.5 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary	VEHICLE MAKE: YARIS		

Vehicle Length	4265	mm	167.9	inches	CG behind Front Axle	1046	mm	41.2	inches
Vehicle Width	1695	mm	66.7	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2551	mm	100.4	inches	Total Length of Indentation	1518	mm	59.8	inches
Vehicle Test Weight	1271	KG	2801	pounds	Maximum Static Crush Depth	546	mm	21.5	inches
					Pre-Impact Speed	56	kph	35.0	mph

Vehicle Damage Index	12FDEW6	Principal Direction of Force	0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				4265	167.9	3719	146.4				
				Engine Block							
				450	17.7	450	17.7				
4036	158.9	3746	147.5	Front Bumper Corner				4043	159.2	3732	146.9
				Front of Engine							
				3835	151.0	3464	136.4				
3275	128.9	3356	132.1	Firewall				3317	130.6	3332	131.2
				3300	129.9	0	0.0				
3054	120.2	3060	120.5	Upper Leading Edge of Door				3058	120.4	3064	120.6
3006	118.3	3011	118.5	Lower Leading Edge of Door				3015	118.7	3012	118.6
2973	117.0	2969	116.9	Bottom of 'A' Post				2968	116.9	2974	117.1
1979	77.9	1964	77.3	Upper Trailing Edge of Door				1982	78.0	1980	78.0
1951	76.8	1950	76.8	Lower Trailing Edge of Door				1954	76.9	1956	77.0
				Steering Column							
				2595	102.2	2657	104.6				
				Center of Seering Column to 'A' Post (Horizontal)							
				375	14.8	366	14.4				
				Center of Steering Column to Headliner (Vertical)							
				445	17.5	475	18.7				

2007 TOYOTA YARIS

NHTSA Crash Test - #5677 - Front Impact

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

Test Vehicle Weight = 2801 pounds
Vehicle Closing Speed = 35.0 mph
Test Crush Length = 66.7 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	11.4	21.5	12.2	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 11.4 inches					316.9
Using a Rated No Damage Speed of	2.5mph	239.7	273.2	105.2	
Using a Rated No Damage Speed of	5.0mph	442.6	232.8	420.7	
Using a Rated No Damage Speed of	7.5mph	608.5	195.6	946.5	
Using a Rated No Damage Speed of	10.0mph	737.5	161.6	1682.7	
Average Crush = 16.7 inches					147.7
Using a Rated No Damage Speed of	2.5mph	163.7	127.3	105.2	
Using a Rated No Damage Speed of	5.0mph	302.1	108.5	420.7	
Using a Rated No Damage Speed of	7.5mph	415.4	91.1	946.5	
Using a Rated No Damage Speed of	10.0mph	503.5	75.3	1682.7	
Maximum Crush = 21.5 inches					89.1
Using a Rated No Damage Speed of	2.5mph	127.1	76.8	105.2	
Using a Rated No Damage Speed of	5.0mph	234.7	65.5	420.7	
Using a Rated No Damage Speed of	7.5mph	322.7	55.0	946.5	
Using a Rated No Damage Speed of	10.0mph	391.1	45.4	1682.7	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	21.5	33.6	-1.4	-4.1

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 22.8

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

2007 TOYOTA YARIS

NHTSA Crash Test - #5677 - Front Impact

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

Test Vehicle Weight = 2801 pounds
Vehicle Closing Speed = 35.0 mph
Test Crush Length = 59.8 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	11.4	21.5	12.2	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 11.4 inches					353.9
Using a Rated No Damage Speed of	2.5mph	267.7	305.1	117.4	
Using a Rated No Damage Speed of	5.0mph	494.2	259.9	469.7	
Using a Rated No Damage Speed of	7.5mph	679.5	218.4	1056.9	
Using a Rated No Damage Speed of	10.0mph	823.5	180.5	1878.9	
Average Crush = 16.7 inches					164.9
Using a Rated No Damage Speed of	2.5mph	182.7	142.2	117.4	
Using a Rated No Damage Speed of	5.0mph	337.3	121.1	469.7	
Using a Rated No Damage Speed of	7.5mph	463.8	101.8	1056.9	
Using a Rated No Damage Speed of	10.0mph	562.2	84.1	1878.9	
Maximum Crush = 21.5 inches					99.5
Using a Rated No Damage Speed of	2.5mph	141.9	85.8	117.4	
Using a Rated No Damage Speed of	5.0mph	262.0	73.1	469.7	
Using a Rated No Damage Speed of	7.5mph	360.3	61.4	1056.9	
Using a Rated No Damage Speed of	10.0mph	436.7	50.7	1878.9	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	21.5	33.6	-1.4	-4.1

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 22.8

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

2007 TOYOTA YARIS

NHTSA Crash Test - #5677 - Front Impact

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

Test Vehicle Weight = 2801 pounds
Vehicle Closing Speed = 35.0 MPH
Test Crush Length = 66.7 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	11.4	17.6	20.0	20.7	12.2	-0.5	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 11.4 inches					316.9
Using a Rated No Damage Speed of	2.5mph	239.7	273.2	105.2	
Using a Rated No Damage Speed of	5.0mph	442.6	232.8	420.7	
Using a Rated No Damage Speed of	7.5mph	608.5	195.6	946.5	
Using a Rated No Damage Speed of	10.0mph	737.5	161.6	1682.7	
Average Crush = 15.3 inches					175.9
Using a Rated No Damage Speed of	2.5mph	178.6	151.7	105.2	
Using a Rated No Damage Speed of	5.0mph	329.8	129.2	420.7	
Using a Rated No Damage Speed of	7.5mph	453.4	108.6	946.5	
Using a Rated No Damage Speed of	10.0mph	549.5	89.7	1168.3	
Maximum Crush = 20.7 inches					96.1
Using a Rated No Damage Speed of	2.5mph	132.0	82.9	105.2	
Using a Rated No Damage Speed of	5.0mph	243.7	70.6	420.7	
Using a Rated No Damage Speed of	7.5mph	335.1	59.3	946.5	
Using a Rated No Damage Speed of	10.0mph	406.2	49.0	1682.7	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	20.7	33.0	-2.0	-6.1

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 23.6

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

2007 TOYOTA YARIS

NHTSA Crash Test - #5677 - Front Impact

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

Test Vehicle Weight = 2801 pounds
Vehicle Closing Speed = 35.0 MPH
Test Crush Length = 59.8 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	11.4	17.6	20.0	20.7	12.2	-0.5	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 11.4 inches					353.9
Using a Rated No Damage Speed of	2.5mph	267.7	305.1	117.4	
Using a Rated No Damage Speed of	5.0mph	494.2	259.9	469.7	
Using a Rated No Damage Speed of	7.5mph	679.5	218.4	1056.9	
Using a Rated No Damage Speed of	10.0mph	823.5	180.5	1878.9	
Average Crush = 15.3 inches					196.5
Using a Rated No Damage Speed of	2.5mph	199.5	169.4	117.4	
Using a Rated No Damage Speed of	5.0mph	368.2	144.3	469.7	
Using a Rated No Damage Speed of	7.5mph	506.3	121.3	1056.9	
Using a Rated No Damage Speed of	10.0mph	613.6	100.2	1304.5	
Maximum Crush = 20.7 inches					107.3
Using a Rated No Damage Speed of	2.5mph	147.4	92.5	117.4	
Using a Rated No Damage Speed of	5.0mph	272.2	78.8	469.7	
Using a Rated No Damage Speed of	7.5mph	374.2	66.2	1056.9	
Using a Rated No Damage Speed of	10.0mph	453.5	54.7	1878.9	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	20.7	33.0	-2.0	-6.1

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 23.6

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: 2006 - 2010
Make: TOYOTA
Model: YARIS 4D

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
6069	2007 TOYOTA YARIS FOUR DOOR SEDAN	5.0	11.7	24.7	255.4	86.4	377.3	135.8	21.0
6221	2008 TOYOTA YARIS THREE DOOR HATCHBACK	5.0	19.2	34.9	257.7	80.3	413.3	109.4	25.4
5677	2007 TOYOTA YARIS FOUR DOOR SEDAN	5.0	15.3	35.0	330.3	129.7	420.7	176.5	32.0
	Average (AVG)				**281.1**	**98.8**	**403.8**	**140.6**	**26.1**
	Minimum (MIN)				**255.4**	**80.3**	**377.3**	**109.4**	**21.0**
	Maximum (MAX)				**330.3**	**129.7**	**420.7**	**176.5**	**32.0**
	Standard Deviation (STDev-sample)				**42.6**	**26.9**	**23.2**	**33.8**	**5.5**
	Number of Tests (n)			**3**					

4N6XPRT Systems
Expert System Software for Litigation

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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 Rio was used, with the Stiffness Values from the range of tests for the Toyota Yaris as the "Known Good" values.

In this set of tests, the Kis Rio stiffness values based on AVERAGE crush were used.

2007 TOYOTA YARIS - Front Impact

Curb Weight (pounds):	2275
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	2275
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	21.35
Damage Length (inches):	66.0
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	1137.25

"Known" Stifness Values

	A	B
Average	281.1	98.8
Minimum	255.4	80.3
Maximum	330.3	129.7
Std. Devation	42.6	26.9

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	19.20	13.20	253.44	9.60	2433.02	6.60	1672.70
C2 (inches)	19.20	13.20	261.36	9.90	2588.26	19.87	5192.35
C3 (inches)	20.40	13.20	269.28	10.20	2746.66	33.00	8886.24
C4 (inches)	20.40	13.20	285.12	10.81	3082.46	46.32	13207.39
C5 (inches)	22.80	13.20	339.90	12.93	4395.36	59.65	20275.73
C6 (inches)	28.70						
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 21.35

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	255.4	80.3	65003.57	134243.75	42.1	36.5	71.5
Avg - 2 Std. Deviations	195.9	45.0	38169.45	82520.40	33.0	28.6	56.0
Avg - 1 Std. Deviations	238.5	71.9	58527.65	121528.97	40.0	34.8	68.1
Average	281.1	98.8	78885.84	160730.94	46.0	40.0	78.3
Avg + 1 Std. Deviations	323.7	125.7	99244.04	200002.15	51.4	44.6	87.4
Avg + 2 Std. Deviations	366.3	152.6	119602.23	239305.98	56.2	48.8	95.6
Maximum	330.3	129.7	102280.04	205879.89	52.1	45.3	88.6

Damage Centroid Depth (x) (inches)	10.82	k^2	2317.89
Damage Centroid Depth (y) (inches)	34.94	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	1409.10		

2003 KIA RIO - Front Impact

Curb Weight (pounds):	2375
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	2375
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	7.24
Damage Length (inches):	66.0
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	1240.25

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	15.72	13.20	176.62	6.76	1193.61	6.22	1097.71
C2 (inches)	11.04	13.20	151.27	5.73	867.18	19.88	3007.38
C3 (inches)	11.88	13.20	106.13	4.33	459.07	31.95	3390.71
C4 (inches)	4.20	13.20	35.64	1.49	53.06	44.98	1603.01
C5 (inches)	1.20	13.20	7.92	0.40	3.17	57.20	453.02
C6 (inches)	0.00						
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 7.24

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	396.1	217.4	65003.57	64411.75	28.5	35.0	48.3
Avg - 2 Std. Deviations	293.4	119.2	38169.45	39258.33	22.3	27.4	35.8
Avg - 1 Std. Deviations	373.6	193.4	58527.65	58364.65	27.2	33.3	45.5
Average	440.9	269.3	78885.84	77339.62	31.3	38.3	53.7
Avg + 1 Std. Deviations	500.0	346.3	99244.04	96231.66	34.9	42.7	61.0
Avg + 2 Std. Deviations	553.4	424.2	119602.23	115065.20	38.1	46.7	67.5
Maximum	508.3	357.9	102280.04	99043.57	35.4	43.4	62.0

Damage Centroid Depth (x) (inches)	5.39	k^2	2421.39
Damage Centroid Depth (y) (inches)	20.00	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	477.58		

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 2006 - 2010
Make: TOYOTA
Model: YARIS 4D

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
6069	2007 TOYOTA YARIS FOUR DOOR SEDAN	5.0	13.4	24.7	221.8	65.2	377.3	102.4	18.2
5677	2007 TOYOTA YARIS FOUR DOOR SEDAN	5.0	21.5	35.0	234.7	65.5	420.7	89.1	22.8
6221	2008 TOYOTA YARIS THREE DOOR HATCHBACK	5.0	20.4	34.9	243.0	71.4	413.3	97.3	24.0
	Average (AVG)				**233.2**	**67.4**	**403.8**	**96.3**	**21.7**
	Minimum (MIN)				**221.8**	**65.2**	**377.3**	**89.1**	**18.2**
	Maximum (MAX)				**243.0**	**71.4**	**420.7**	**102.4**	**24.0**
	Standard Deviation (STDev-sample)				**10.7**	**3.5**	**23.2**	**6.7**	**3.1**
	Number of Tests (n)			**3**					

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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 Rio was used, with the Stiffness Values from the range of tests for the Toyota Yaris as the "Known Good" values.

In this set of tests, the Kis Rio stiffness values based on MAXIMUM crush were used.

2007 TOYOTA YARIS 4D - Front Impact

Curb Weight (pounds):	2275
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	2275
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	21.35
Damage Length (inches):	66.0
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	1137.25

"Known" Stifness Values

	A	B
Average	233.2	67.4
Minimum	221.8	65.2
Maximum	243.0	71.4
Std. Devation	10.7	3.5

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	19.20	13.20	253.44	9.60	2433.02	6.60	1672.70
C2 (inches)	19.20	13.20	261.36	9.90	2588.26	19.87	5192.35
C3 (inches)	20.40	13.20	269.28	10.20	2746.66	33.00	8886.24
C4 (inches)	20.40	13.20	285.12	10.81	3082.46	46.32	13207.39
C5 (inches)	22.80	13.20	339.90	12.93	4395.36	59.65	20275.73
C6 (inches)	28.70						
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 21.35

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	Closing Speed (MPH)
Minimum	221.8	65.2	53256.06	110955.10	38.3	33.2	65.1
Avg - 2 Std. Deviations	211.8	60.4	49544.22	103650.03	37.0	32.1	62.9
Avg - 1 Std. Deviations	222.5	63.9	52363.25	109441.27	38.0	33.0	64.6
Average	233.2	67.4	55182.27	115232.71	39.0	33.8	66.3
Avg + 1 Std. Deviations	243.9	70.9	58001.30	121024.31	39.9	34.7	67.9
Avg + 2 Std. Deviations	254.6	74.4	60820.32	126816.05	40.9	35.5	69.5
Maximum	243.0	71.4	58323.87	121520.83	40.0	34.8	68.0

Damage Centroid Depth (x) (inches)	10.82	k^2	2317.89
Damage Centroid Depth (y) (inches)	34.94	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	1409.10		

2003 KIA RIO - Front Impact

Curb Weight (pounds):	2375
Occupant + Cargo Weight (pounds):	0
Total Weight (pounds):	2375
Angle Coll Force to Normal (degrees):	0.0
No Damage Speed (mph):	5.0
Energy Crush Depth (inches):	7.24
Damage Length (inches):	66.0
Crush Profile Measurements:	6

PDOF

Lever Arm Distance (inches):	0.00
Yaw Moment of Inertia (lb-ft-sec^2)	1240.25

		Equal Spacing (inches)	Zone Area (inches^2)	Zone Depth(x) (inches)	Area Depth(x) (inches^2)	Zone Depth(y) (inches)	Area Depth(y) (inches^2)
C1 (inches)	15.72	13.20	176.62	6.76	1193.61	6.22	1097.71
C2 (inches)	11.04	13.20	151.27	5.73	867.18	19.88	3007.38
C3 (inches)	11.88	13.20	106.13	4.33	459.07	31.95	3390.71
C4 (inches)	4.20	13.20	35.64	1.49	53.06	44.98	1603.01
C5 (inches)	1.20	13.20	7.92	0.40	3.17	57.20	453.02
C6 (inches)	0.00						
C7 (inches)							
C8 (inches)							
C9 (inches)							
C10 (inches)							

Average Crush (inches): 7.24

Results

	A	B	Average Force (pounds)	Damage Energy (ft*lbs)	KE Speed (mph)	Delta V (mph)	bsub1
Minimum	354.4	174.0	53256.06	53432.76	26.0	31.8	43.2
Avg - 2 Std. Deviations	340.3	160.4	49544.22	49954.33	25.1	30.8	41.5
Avg - 1 Std. Deviations	351.0	170.7	52363.25	52596.55	25.8	31.6	42.8
Average	361.5	181.0	55182.27	55235.90	26.4	32.4	44.1
Avg + 1 Std. Deviations	371.7	191.4	58001.30	57872.62	27.0	33.2	45.3
Avg + 2 Std. Deviations	381.7	201.8	60820.32	60506.87	27.6	34.0	46.5
Maximum	372.9	192.6	58323.87	58174.17	27.1	33.3	45.5

Damage Centroid Depth (x) (inches)	5.39	k^2	2421.39
Damage Centroid Depth (y) (inches)	20.00	Eff. Mass Ratio (gamma)	1.00
Area of Damage (inches^2):	477.58		

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: 1J4RR6GTXBC500016

Model:	2011 Jeep Grand Cherokee 4x4 4-Door Sport Utility
Engine Size:	4.2 L/ 258 cu.in.
Engine Description:	In-line 6 cylinder with Overhead Valves
Horse Power:	112 @ 3000 rpm
Torque:	210 lb-ft @ 2000 rpm
Injection System:	2 Bbl Carburetor
PSI:	4-5 psi
Ignition:	Electronic
Manufacturer:	Chrysler
Assembly Plant:	Jefferson (Detroit, MI)
Drive Wheels:	This is a 4 Wheel Drive vehicle

The First through Third characters (1J4) indicate a Jeep Multi-purpose Vehicle (MPV) made in the U.S.A.

The Fourth character (R) indicates a GVWR of 6001 - 7000 lbs.

The Fifth and Sixth characters (R6) indicate a Grand Cherokee 4x4 and a Overland series

The Seventh character (G) indicates a 4-Door Sport Utility

The Eighth character (T) indicates the OEM engine: 4.2 L/ 258 cu.in., L6, OHV

The Ninth character (the check digit) is entered as X.
The VIN appears Valid, the calculated value is 10. (The display Character should be X)

The Tenth character (B) indicates the model year 2011

The Eleventh character (C) indicates the vehicle was made in the assembly plant in Jefferson (Detroit, MI)

The Twelfth through Seventeenth characters (500016) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

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

5/9/2012

2011 JEEP GRAND CHEROKEE 4 DOOR 4X4 UTILITY

Curb Weight:	4755 lbs.		2157	kg.
Curb Weight Distribution - Front:	52 %	Rear:	48	%
Gross Vehicle Weight Rating:	6500 lbs.		2948	kg.
Number of Tires on Vehicle:	4			
Drive Wheels:	4 Wheel Drive			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	190	15.83	4.83
Wheelbase:	115	9.58	2.92
Front Bumper to Front Axle:	33	2.75	0.84
Front Bumper to Front of Front Well:	15	1.25	0.38
Front Bumper to Front of Hood:	7	0.58	0.18
Front Bumper to Base of Windshield:	49	4.08	1.24
Front Bumper to Top of Windshield:	78	6.50	1.98
Rear Bumper to Rear Axle:	42	3.50	1.07
Rear Bumper to Rear of Rear Well:	21	1.75	0.53
Rear Bumper to Rear of Trunk:	3	0.25	0.08
Rear Bumper to Base of Rear Window:	5	0.42	0.13
Width Dimensions			
Maximum Width:	76	6.33	1.93
Front Track:	64	5.33	1.63
Rear Track:	64	5.33	1.63
Vertical Dimensions			
Height:	69	5.75	1.75
Ground to -			
Front Bumper (Top)	27	2.25	0.69
Headlight - center	36	3.00	0.91
Hood - top front:	41	3.42	1.04
Base of Windshield	47	3.92	1.19
Rear Bumper - top:	30	2.50	0.76
Trunk - top rear:	48	4.00	1.22
Base of Rear Window:	51	4.25	1.30

2011 JEEP GRAND CHEROKEE 4 DOOR 4X4 UTILITY

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	59	4.92	1.50
Front Seat to Headliner	40	3.33	1.02
Front Leg Room - seatback to floor (max)	40	3.33	1.02
Rear Seat Shoulder Width	58	4.83	1.47
Rear Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (min)	39	3.25	0.99

Seatbelts: 3pt - front and rear

Airbags: FRONT SEAT AIRBAGS + SIDE AIRBAGS

Steering Data

	Inches	Feet	Meters
Turning Circle (Diameter)	444	37.00	11.28

Steering Ratio: 17.29:1

Wheel Radius:

Tire Size (OEM): 245/70R17

Acceleration & Braking Information

Brake Type: ALL DISC

ABS System: ALL WHEEL ABS

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):

d = 128.0 ft t = 2.9 sec a = -30.2 ft/sec² G-force = -0.94

Acceleration:

	t		a		G-force
0 to 30mph	3.1 sec		14.2	ft/sec²	0.44
0 to 60mph	8.4 sec		10.5	ft/sec²	0.33
45 to 65mph	4.4 sec		6.7	ft/sec²	0.21

Transmission Type: 5spd AUTOMATIC

Notes:

Federal Bumper Standard Requirements: No Requirement

N.S.D.C = 2011 - 2012

2011 JEEP GRAND CHEROKEE 4 DOOR 4X4 UTILITY

Other Information

Tip-Over Stability Ratio =	1.16	Reasonably Stable
NHTSA Star Rating (calculated)		***

Center of Gravity (No Load):

Inches behind front axle	=	55.20
Inches in front of rear axle	=	59.80
Inches from side of vehicle	=	38.00
Inches from ground	=	27.53
Inches from front corner	=	96.04
Inches from rear corner	=	108.66
Inches from front bumper	=	88.20
Inches from rear bumper	=	101.80

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	3554.65	lb*ft*sec²
Pitch Moment of Inertia	=	3668.60	lb*ft*sec²
Roll Moment of Inertia	=	811.10	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	63.4	deg
Angle Front of Hood to Windshield Base	=	8.1	deg
Angle Front of Hood to Windshield Top	=	20.1	deg
Angle of Windshield	=	34.6	deg
Angle of Steering Tires at Max Turn	=	29.7	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 (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).

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: ZBBBS00A4H7160873

Model:	1987 Bertone X 1/9 Convertible
Engine Size:	1.5 L/ 92 cu.in.
Engine Description:	Inline 4 cylinder with Overhead Cams
Horse Power:	75 @ 5500 rpm
Torque:	79 lb-ft at 3000 rpm
Injection System:	electronic Fuel Injection (EFI)
PSI:	28-37 psi
Ignition:	Electronic
Manufacturer:	Fiat
Assembly Plant:	Lordstown, OH.
Drive Wheels:	This is a Rear Wheel Drive vehicle

The First through Third characters (ZBB) indicate a Bertone product made in Italy

The Fourth character (B) indicates the model: X 1/9

The Fifth and Sixth characters (S0) indicate a Convertible, Basic Version

The Seventh character (0) indicates the Restraints: Manual Belts

The Eighth character (A) indicates the OEM engine: L4, 1.5 L/ 92 cu.in., OHC

The Ninth character (the check digit) is entered as 4.
The VIN appears Valid, the calculated value is 4.

The Tenth character (H) indicates the model year 1987

The Eleventh character (7) indicates the vehicle was made in the assembly plant in Turin, Italy

The Twelfth through Seventeenth characters (160873) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.2

PROVIDED BY:

4N6XPRT Systems

8387 University Avenue

La Mesa CA 91941

6/6/2012

1987 BERTONE X 1/9 2 DOOR COUPE

Curb Weight:	2130	lbs.	966	kg.
Curb Weight Distribution - Front:	56	% Rear:	44	%
Gross Vehicle Weight Rating:	2640	lbs.	1197	kg.
Number of Tires on Vehicle:	4			
Drive Wheels:	REAR			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	156	13.00	3.96
Wheelbase:	87	7.25	2.21
Front Bumper to Front Axle:	41	3.42	1.04
Front Bumper to Front of Front Well:	19	1.58	0.48
Front Bumper to Front of Hood:	7	0.58	0.18
Front Bumper to Base of Windshield:	55	4.58	1.40
Front Bumper to Top of Windshield:	75	6.25	1.91
Rear Bumper to Rear Axle:	28	2.33	0.71
Rear Bumper to Rear of Rear Well:	18	1.50	0.46
Rear Bumper to Rear of Trunk:	6	0.50	0.15
Rear Bumper to Base of Rear Window:	49	4.08	1.24
Width Dimensions			
Maximum Width:	62	5.17	1.57
Front Track:	53	4.42	1.35
Rear Track:	54	4.50	1.37
Vertical Dimensions			
Height:	47	3.92	1.19
Ground to -			
Front Bumper (Top)	19	1.58	0.48
Headlight - center	24	2.00	0.61
Hood - top front:	23	1.92	0.58
Base of Windshield	30	2.50	0.76
Rear Bumper - top:	19	1.58	0.48
Trunk - top rear:	27	2.25	0.69
Base of Rear Window:	36	3.00	0.91

1987 BERTONE X 1/9 2 DOOR COUPE

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width			
Front Seat to Headliner			
Front Leg Room - seatback to floor (max)			
Rear Seat Shoulder Width			
Rear Seat to Headliner			
Front Leg Room - seatback to floor (min)			

Seatbelts: 3pt LAP & SHOULDER - front, None or Unknown - rear

Airbags: NO AIRBAGS

Steering Data

Turning Circle (Diameter)			
Steering Ratio:	:1		
Wheel Radius:	10	0.83	0.25
Tire Size (OEM):	P165/70SR13		

Acceleration & Braking Information

Brake Type: ALL DISC

ABS System: ABS UNKNOWN

Braking, 60 mph to 0 (Hard pedal, no skid, dry pavement):

d = ft t = sec a = ft/sec² G-force =

Acceleration:

0 to 30mph	t =	sec	a =	ft/sec²	G-force =	
0 to 60mph	t =	sec	a =	ft/sec²	G-force =	
45 to 65mph	t =	sec	a =	ft/sec²	G-force =	

Transmission Type: 5spd MANUAL

Notes:

Federal Bumper Standard Requirements: 2.5 mph

This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 1984 - 1990

1987 BERTONE X 1/9 2 DOOR COUPE

Other Information

Tip-Over Stability Ratio =	1.39	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	38.28
Inches in front of rear axle	=	48.72
Inches from side of vehicle	=	31.00
Inches from ground	=	19.20
Inches from front corner	=	85.13
Inches from rear corner	=	82.75
Inches from front bumper	=	79.28
Inches from rear bumper	=	76.72

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	987.90	lb*ft*sec²
Pitch Moment of Inertia	=	959.70	lb*ft*sec²
Roll Moment of Inertia	=	233.40	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	29.7	deg
Angle Front of Hood to Windshield Base	=	8.3	deg
Angle Front of Hood to Windshield Top	=	17.9	deg
Angle of Windshield	=	36.9	deg
Angle of Steering Tires at Max Turn	=		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).

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: KNAFB1214X5804909

Model:	1999 Kia Sephia 4-Door Sedan
Engine Size:	1.8L / 109 cu.in.
Engine Description:	Inline 4 cylinder with Dual Overhead Cam
Horse Power:	125 @ 6000 rpm
Torque:	120 lb-ft at 4500 rpm
Injection System:	Electronic Gasoline Injection (EGI)
PSI:	47-48 psi
Ignition:	electronic
Manufacturer:	Kia
Assembly Plant:	Asan, Korea
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Dual Air Bags

The First through Third characters (KNA) indicate a Kia Car made in Korea

The Fourth and Fifth characters (FB) indicate a Sephia

The Sixth and Seventh characters (12) indicate a 4-Door Sedan

The Eighth character (1) indicates the OEM engine: 1.8L / 109 cu.in., L4, DOHC

The Ninth character (the check digit) is entered as 4.
The VIN appears Valid, the calculated value is 4.

The Tenth character (X) indicates the model year 1999

The Eleventh character (5) indicates the vehicle was made in the assembly plant in Asan, Korea

The Twelfth through Seventeenth characters (804909) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

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

5/9/2012

1999 KIA SEPHIA 4 DOOR SEDAN

Curb Weight:		2542	lbs.	1153	kg.
Curb Weight Distribution -	Front:	63	% Rear:	37	%
Gross Vehicle Weight Rating:		3549	lbs.	1610	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	174	14.50	4.42
Wheelbase:	101	8.42	2.57
Front Bumper to Front Axle:	36	3.00	0.91
Front Bumper to Front of Front Well:	22	1.83	0.56
Front Bumper to Front of Hood:	5	0.42	0.13
Front Bumper to Base of Windshield:	46	3.83	1.17
Front Bumper to Top of Windshield:	74	6.17	1.88
Rear Bumper to Rear Axle:	37	3.08	0.94
Rear Bumper to Rear of Rear Well:	24	2.00	0.61
Rear Bumper to Rear of Trunk:	4	0.33	0.10
Rear Bumper to Base of Rear Window:	23	1.92	0.58
Width Dimensions			
Maximum Width:	67	5.58	1.70
Front Track:	56	4.67	1.42
Rear Track:	56	4.67	1.42
Vertical Dimensions			
Height:	56	4.67	1.42
Ground to -			
Front Bumper (Top)	22	1.83	0.56
Headlight - center	26	2.17	0.66
Hood - top front:	28	2.33	0.71
Base of Windshield	37	3.08	0.94
Rear Bumper - top:	25	2.08	0.64
Trunk - top rear:	39	3.25	0.99
Base of Rear Window:	41	3.42	1.04

1999 KIA SEPHIA 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	55	4.58	1.40
Front Seat to Headliner	40	3.33	1.02
Front Leg Room - seatback to floor (max)	42	3.50	1.07
Rear Seat Shoulder Width	54	4.50	1.37
Rear Seat to Headliner	38	3.17	0.97
Front Leg Room - seatback to floor (min)	29	2.42	0.74

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	444	37.00	11.28
Steering Ratio: :1			
Wheel Radius:	11	0.92	0.28
Tire Size (OEM): P185/65R14			

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 pavement):
d = 135.0 ft t = 3.1 sec a = -28.6 ft/sec² G-force = -0.89

Acceleration:

0 to 30mph	t =	2.8	sec	a =	15.7	ft/sec²	G-force = 0.49
0 to 60mph	t =	9.6	sec	a =	9.2	ft/sec²	G-force = 0.28
45 to 65mph	t =	5.5	sec	a =	5.3	ft/sec²	G-force = 0.17

Transmission Type: 5spd MANUAL

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 1999 - 2001

1999 KIA SEPHIA 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.27	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	37.37
Inches in front of rear axle	=	63.63
Inches from side of vehicle	=	33.50
Inches from ground	=	21.98
Inches from front corner	=	80.66
Inches from rear corner	=	106.06
Inches from front bumper	=	73.37
Inches from rear bumper	=	100.63

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	1412.26	lb*ft*sec²
Pitch Moment of Inertia	=	1367.58	lb*ft*sec²
Roll Moment of Inertia	=	307.56	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	50.2	deg
Angle Front of Hood to Windshield Base	=	12.4	deg
Angle Front of Hood to Windshield Top	=	20.6	deg
Angle of Windshield	=	31.3	deg
Angle of Steering Tires at Max Turn	=	26.1	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 (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).

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: 1FALP10P3VW131607

Model:	1997 Ford Escort 4 door Sedan
Engine Size:	2.0 L/ 121 cu.in.
Engine Description:	In-Line 4 cylinder with Single Overhead Cam
Horse Power:	110 @ 5000 rpm
Torque:	125 lb-ft at 3800 rpm
Injection System:	Sequential Port Fuel Injection (SEFI)
PSI:	35-40 psi
Ignition:	electronic
Manufacturer:	Ford
Assembly Plant:	Wayne, MI
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Manual Seatbelts + Driver/Passgr Air Bag

The First through Third characters (1FA) indicate a Ford Passenger Car made in the U.S.A.

The Fourth character (L) indicates Manual Seatbelts + Driver/Passgr Air Bag

The Fifth through Seventh characters (P10) indicate an Escort and a 4 door Sedan

The Eighth character (P) indicates the OEM engine: 2.0 L/ 121 cu.in., L4, SOHC

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

The Tenth character (V) indicates the model year 1997

The Eleventh character (W) indicates the vehicle was made in the assembly plant in Wayne, MI

The Twelfth through Seventeenth characters (131607) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

PROVIDED BY:

4N6XPRT Systems

8387 University Avenue

La Mesa CA 91942

5/9/2012

1997 FORD ESCORT 4 DOOR SEDAN

Curb Weight:		2450	lbs.	1111	kg.
Curb Weight Distribution -	Front:	64	% Rear:	36	%
Gross Vehicle Weight Rating:		3485	lbs.	1581	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	175	14.58	4.44
Wheelbase:	98	8.17	2.49
Front Bumper to Front Axle:	34	2.83	0.86
Front Bumper to Front of Front Well:	19	1.58	0.48
Front Bumper to Front of Hood:	5	0.42	0.13
Front Bumper to Base of Windshield:	47	3.92	1.19
Front Bumper to Top of Windshield:	73	6.08	1.85
Rear Bumper to Rear Axle:	43	3.58	1.09
Rear Bumper to Rear of Rear Well:	25	2.08	0.64
Rear Bumper to Rear of Trunk:	6	0.50	0.15
Rear Bumper to Base of Rear Window:	23	1.92	0.58
Width Dimensions			
Maximum Width:	67	5.58	1.70
Front Track:	56	4.67	1.42
Rear Track:	56	4.67	1.42
Vertical Dimensions			
Height:	53	4.42	1.35
Ground to -			
Front Bumper (Top)	22	1.83	0.56
Headlight - center	26	2.17	0.66
Hood - top front:	27	2.25	0.69
Base of Windshield	36	3.00	0.91
Rear Bumper - top:	23	1.92	0.58
Trunk - top rear:	37	3.08	0.94
Base of Rear Window:	40	3.33	1.02

1997 FORD ESCORT 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	52	4.33	1.32
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	43	3.58	1.09
Rear Seat Shoulder Width	52	4.33	1.32
Rear Seat to Headliner	37	3.08	0.94
Front Leg Room - seatback to floor (min)	34	2.83	0.86

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	372	31.00	9.45
Steering Ratio:	:1		
Wheel Radius:			
Tire Size (OEM):	P185/65R14		

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 pavement):
d = 148.0 ft t = 3.4 sec a = -26.1 ft/sec² G-force = -0.81

Acceleration:

0 to 30mph	t =	2.9	sec	a =	15.2	ft/sec²	G-force = 0.47
0 to 60mph	t =	9.2	sec	a =	9.6	ft/sec²	G-force = 0.30
45 to 65mph	t =	5.3	sec	a =	5.5	ft/sec²	G-force = 0.17

Transmission Type: 5spd MANUAL

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 1997 - 2003

1997 FORD ESCORT 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.35	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	35.28
Inches in front of rear axle	=	62.72
Inches from side of vehicle	=	33.50
Inches from ground	=	20.80
Inches from front corner	=	76.95
Inches from rear corner	=	110.90
Inches from front bumper	=	69.28
Inches from rear bumper	=	105.72

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	1317.50	lb*ft*sec²
Pitch Moment of Inertia	=	1276.50	lb*ft*sec²
Roll Moment of Inertia	=	291.00	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	45.0	deg
Angle Front of Hood to Windshield Base	=	12.1	deg
Angle Front of Hood to Windshield Top	=	19.4	deg
Angle of Windshield	=	30.0	deg
Angle of Steering Tires at Max Turn	=	30.2	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 (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

Derived from

NHTSA Crash Test

#2501

1997 FORD ESCORT

Provided By

4N6XPRT StifCalcs®

Registered to:

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

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(800) 266-9778 | (619) 464-3478 | FAX: (619) 464-2206 | Email: 4n6@4n6xprt.com

Sister/Clone database reader

You entered: **1997 FORD ESCORT**

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

Year Range	Make	Model	Body Styles	Wheelbase
1997 - 2000	FORD	ESCORT	3D, 4D, 5D, SW	98.4
Remarks: Wagon discontinued after 1999				
2001 - 2003	FORD	ESCORT	3D, 4D, 5D, SW	98.4
Remarks: Fleet use only				

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 #	2501	NHTSA Test Reference Guide Version #	V4			
Test Date	1996-11-26	Contract #	DTNH22-93-C-02047			
Contract/Study Title	FMVSS 214 COMPLIANCE (RIGHT SIDE) 1997 FORD ESCORT 4 DOOR (CV0205)					
Test Objective(s)	VEHICLE CRASHWORTHINESS AND OCCUPANT PROTECTION					
Test Type	FMVSS 214 SIDE IMPACT PROTECTION	Configuration	IMPACTOR INTO VEHICLE			
Impact Angle	90	Side Impact Point	N/A	mm	N/A	inches
		Offset Distance	0	mm	0.0	inches
		Closing Speed	53.3	Km/Hr	33.12	MPH
Test Performer	MGA RESEARCH					
Test Reference #	BT96112601					
Test Track Surface	CONCRETE	Condition	DRY			
Ambient Temperature	21 C	69.8 F	Total Number of Curves	54		
Data Recorder Type	OTHER	Data Link	UMBILICAL CABLE			
Test Commentary	ANALOG TO DIGITAL RECORDING WITH DAS 16F METRABYTE CARD					

Fixed Barrier Information

Barrier Type		Pole Barrier Diameter		mm	inches
Barrier Shape					
Barrier Commentary					

1997 FORD ESCORT RIGHT FRONT SEAT OCCUPANT

Test #	2501						
Vehicle #	2		Sex	MALE			
Location	RIGHT FRONT SEAT		Age	99			
Position	CENTER POSITION		Height	999	mm	39.3	inches
Type	APR SIDE IMPACT DUMMY		Weight	999.0	kg	2202	pounds
Size	50 PERCENTILE						

Calibration Method	HSRI
Occupant Manufacturer	FIRST TECHNOLOGY: S/N 271
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	HEAD TO HEADREST AND SHOULDER; RIGHT LEG TO DOOR; LT LEG TO RT LEG

Head

Head to -

Windshielder Header	354	mm	13.9	inches	Head Injury Criteria (HIC)	120		
WindShield	587	mm	23.1	inches	HIC Lower Time Interval (ms)	47.3		
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	83.3		
Side Header	199	mm	7.8	inches				
Side Window	278	mm	10.9	inches				
Neck to Seatback	9999	mm	0.0	inches				

First Contact Region (Head)	OTHER
Second Contact Region (Head)	

Chest

Chest to -

Dash	543	mm	21.4	inches	Arm to Door	103	mm	4.1	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	157	mm	6.2	inches
Seatback	9999	mm	0.0	inches					

Chest Severity Index	9999	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	999.9

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)	NONE
Second Contact Region (Chest/Abdomen)	NONE

Legs

Knees to Dash	167	mm	6.6	inches	Knees to Seatback	9999	mm	0.0	inches

Left Femur Peak Load	-9999	Newtons	-2247.9	pounds Force
Right Femur Peak Load	-9999	Newtons	-2247.9	pounds Force

First Contact Region (Legs)	OTHER
Second Contact Region (Legs)	

1997 FORD ESCORT RIGHT FRONT SEAT OCCUPANT

Test #	2501					
Vehicle #	2	Sex	MALE			
Location	RIGHT FRONT SEAT	Age	99			
Position	CENTER POSITION	Height	999	mm	39.3	inches
Type	APR SIDE IMPACT DUMMY	Weight	999.0	kg	2202	pounds
Size	50 PERCENTILE					

Calibration Method	HSRI
Occupant Manufacturer	FIRST TECHNOLOGY: S/N 271
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	HEAD TO HEADREST AND SHOULDER; RIGHT LEG TO DOOR; LT LEG TO RT LEG

Restraints

Restraint # 1	3 POINT BELT
Mounted	
Deployment	UNKNOWN
Restraint Commentary	NO COMMENTS
Restraint # 2	FRONTAL AIRBAG
Mounted	
Deployment	UNKNOWN
Restraint Commentary	NO COMMENTS

1997 FORD ESCORT RIGHT REAR SEAT OCCUPANT

Test #	2501		
Vehicle #	2	Sex	MALE
Location	RIGHT REAR SEAT	Age	99
Position	NONADJUSTABLE SEAT	Height	999 mm 39.3 inches
Type	APR SIDE IMPACT DUMMY	Weight	999.0 kg 2202 pounds
Size	50 PERCENTILE		
Calibration Method	HSRI		
Occupant Manufacturer	FIRST TECHNOLOGIES: S/N 272		
Occupant Modification	NO COMMENTS		
Occupant Description	NO COMMENTS		
Occupant Commentary	RIGHT LEG TO DOOR PANEL; LEFT LEG TO RIGHT LEG		

Head

Head to -

Windshielder Header	9999	mm	0.0	inches	Head Injury Criteria (HIC)	1040	
WindShield	9999	mm	0.0	inches	HIC Lower Time Interval (ms)	53.1	
Seatback	557	mm	21.9	inches	HIC Upper Time Interval (ms)	61.5	
Side Header	191	mm	7.5	inches			
Side Window	229	mm	9.0	inches			
Neck to Seatback	9999	mm	0.0	inches			
First Contact Region (Head)	C PILLAR						
Second Contact Region (Head)							

Chest

Chest to -

Dash	9999	mm	0.0	inches	Arm to Door	115	mm	4.5	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	136	mm	5.4	inches
Seatback	471	mm	18.5	inches					
Chest Severity Index	9999				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	999.9			
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)	NONE								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	9999	mm	0.0	inches	Knees to Seatback	174	mm	6.9	inches
Left Femur Peak Load	-9999	Newtons	-2247.9	pounds Force					
Right Femur Peak Load	-9999	Newtons	-2247.9	pounds Force					
First Contact Region (Legs)	OTHER								
Second Contact Region (Legs)									

1997 FORD ESCORT RIGHT REAR SEAT OCCUPANT

Test #	2501					
Vehicle #	2	Sex	MALE			
Location	RIGHT REAR SEAT	Age	99			
Position	NONADJUSTABLE SEAT	Height	999	mm	39.3	inches
Type	APR SIDE IMPACT DUMMY	Weight	999.0	kg	2202	pounds
Size	50 PERCENTILE					

Calibration Method	HSRI
Occupant Manufacturer	FIRST TECHNOLOGIES: S/N 272
Occupant Modification	NO COMMENTS
Occupant Description	NO COMMENTS
Occupant Commentary	RIGHT LEG TO DOOR PANEL; LEFT LEG TO RIGHT LEG

Restraints

Restraint # 1	3 POINT BELT
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS
Restraint # 2	NONE
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS

Vehicle 1 0 NHTSA DEFORMABLE IMPACTOR

Test #	2501		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	0 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description	FMVSS 214 DEFORMABLE BARRIER AND IMPACTOR		
Vehicle Commentary	FMVSS 214 MOVING BARRIER		

Vehicle Length	4115	mm	162.0	inches	CG behind Front Axle	1106	mm	43.5	inches
Vehicle Width	2014	mm	79.3	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2591	mm	102.0	inches	Total Length of Indentation	99999	mm	0.0	inches
Vehicle Test Weight	1357	KG	2991	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	53	kph	33.1	mph

Vehicle Damage Index: 9999999

Principal Direction of Force: 27

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	0	mm	0.0	inches
DPD 2	0	mm	0.0	inches
DPD 3	0	mm	0.0	inches
DPD 4	0	mm	0.0	inches
DPD 5	0	mm	0.0	inches
DPD 6	0	mm	0.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Centerline	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Right Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
27.0	DIRECT ENGAGEMENT	999.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
NOT APPLICABLE	27.0	DIRECT ENGAGEMENT
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 0 NHTSA DEFORMABLE IMPACTOR

Test #	2501		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	0 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description	FMVSS 214 DEFORMABLE BARRIER AND IMPACTOR		
Vehicle Commentary	FMVSS 214 MOVING BARRIER		

Vehicle Length	4115	mm	162.0	inches	CG behind Front Axle	1106	mm	43.5	inches
Vehicle Width	2014	mm	79.3	inches	Center of Damage to CG Axis	9999	mm	0.0	inches
Vehicle Wheelbase	2591	mm	102.0	inches	Total Length of Indentation	99999	mm	0.0	inches
Vehicle Test Weight	1357	KG	2991	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	53	kph	33.1	mph

Vehicle Damage Index 9999999 Principal Direction of Force 27

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				0	0.0	0	0.0				
				Engine Block							
				0	0.0	0	0.0				
0	0.0	0	0.0	Front Bumper Corner				0	0.0	0	0.0
				Front of Engine							
				0	0.0	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	0.0	Upper Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Bottom of 'A' Post				0	0.0	0	0.0
0	0.0	0	0.0	Upper Trailing Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Trailing Edge of Door				0	0.0	0	0.0
				Steering Column							
				0	0.0	0	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				0	0.0	0	0.0				
				Center of Steering Column to Headliner (Vertical)							
				0	0.0	0	0.0				

Vehicle 2 1997 FORD ESCORT

Test #	2501		
VIN	1FALP13P0VW136646	NHTSA Test Vehicle Number	2
Year	1997	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	FORD	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	ESCORT	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NO COMMENTS		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	4312	mm	169.8	inches	CG behind Front Axle	1015	mm	40.0	inches
Vehicle Width	1709	mm	67.3	inches	Center of Damage to CG Axis	-35	mm	-1.4	inches
Vehicle Wheelbase	2496	mm	98.3	inches	Total Length of Indentation	3600	mm	141.7	inches
Vehicle Test Weight	1314	KG	2896	pounds	Maximum Static Crush Depth	355	mm	14.0	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index: 09LPAW7

Principal Direction of Force: 63

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	0	mm	0.0	inches
DPD 2	140	mm	5.5	inches
DPD 3	290	mm	11.4	inches
DPD 4	310	mm	12.2	inches
DPD 5	63	mm	2.5	inches
DPD 6	0	mm	0.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	154.5	inches	155.6	inches	-1.1	inches
	3924	mm	3953	mm	-29	mm
Centerline	169.8	inches	170.7	inches	-0.9	inches
	4312	mm	4336	mm	-24	mm
Right Bumper Corner	154.5	inches	154.4	inches	0.1	inches
	3924	mm	3921	mm	3	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
27.0	DIRECT ENGAGEMENT	90.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
NOT APPLICABLE	0.0	DIRECT ENGAGEMENT
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 2 1997 FORD ESCORT

Test #	2501		
VIN	1FALP13P0VW136646	NHTSA Test Vehicle Number	2
Year	1997	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	FORD	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	ESCORT	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2 Liter	Transmission	MANUAL - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	NO COMMENTS		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	4312	mm	169.8	inches	CG behind Front Axle	1015	mm	40.0	inches
Vehicle Width	1709	mm	67.3	inches	Center of Damage to CG Axis	-35	mm	-1.4	inches
Vehicle Wheelbase	2496	mm	98.3	inches	Total Length of Indentation	3600	mm	141.7	inches
Vehicle Test Weight	1314	KG	2896	pounds	Maximum Static Crush Depth	355	mm	14.0	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index	09LPAW7	Principal Direction of Force	63

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				4312	169.8	4336	170.7				
				Engine Block							
				0	0.0	0	0.0				
3924	154.5	3953	155.6	Front Bumper Corner				3924	154.5	3921	154.4
				Front of Engine							
				0	0.0	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	0.0	Upper Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Bottom of 'A' Post				0	0.0	0	0.0
0	0.0	0	0.0	Upper Trailing Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Trailing Edge of Door				0	0.0	0	0.0
				Steering Column							
				0	0.0	0	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				0	0.0	0	0.0				
				Center of Steering Column to Headliner (Vertical)							
				0	0.0	0	0.0				

1997 FORD ESCORT

NHTSA Crash Test - #2501 - Side Impact

Damage Profile Distances - Indention Length - KE Equivalent Speed - Trapezoidal Average

Test Vehicle Weight = 2896 pounds
KE Equivalent Speed = 23.6 MPH
Test Crush Length = 141.7 inches

Impactor Weight = 2991
Impactor Test Speed = 33.1

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Rear)	0.0	5.5	11.4	12.2	2.5	0.0	(Front)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 2.5 inches					1460.6
Using a Rated No Damage Speed of	1.0mph	148.1	1339.5	8.2	
Using a Rated No Damage Speed of	2.0mph	283.2	1223.6	32.8	
Using a Rated No Damage Speed of	3.0mph	405.1	1113.0	73.7	
Using a Rated No Damage Speed of	5.0mph	609.6	907.4	204.8	
Average Crush = 6.3 inches					230.0
Using a Rated No Damage Speed of	1.0mph	58.8	210.9	8.2	
Using a Rated No Damage Speed of	2.0mph	112.4	192.7	32.8	
Using a Rated No Damage Speed of	3.0mph	160.7	175.3	73.7	
Using a Rated No Damage Speed of	5.0mph	241.9	142.9	151.9	
Maximum Crush = 12.2 inches					61.3
Using a Rated No Damage Speed of	1.0mph	30.4	56.2	8.2	
Using a Rated No Damage Speed of	2.0mph	58.0	51.4	32.8	
Using a Rated No Damage Speed of	3.0mph	83.0	46.7	73.7	
Using a Rated No Damage Speed of	5.0mph	124.9	38.1	204.8	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	12.2	25.3	1.7	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
Side Impact Test Summary

Report Filter Settings

Year Range: 1997 - 2000
Make: FORD
Model: ESCORT

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
2501	1997 FORD ESCORT FOUR DOOR SEDAN	2.0	6.3	23.6	112.0	191.3	32.8	228.3	35.3
2482	1997 FORD ESCORT FOUR DOOR SEDAN	2.0	6.2	26.9	288.1	583.5	71.1	680.8	47.2
	Average (AVG)				**200.1**	**387.4**	**52.0**	**454.6**	**41.3**
	Minimum (MIN)				**112.0**	**191.3**	**32.8**	**228.3**	**35.3**
	Maximum (MAX)				**288.1**	**583.5**	**71.1**	**680.8**	**47.2**
	Standard Deviation (STDev-sample)				**124.5**	**277.3**	**27.1**	**320.0**	**8.4**
	Number of Tests (n)			**2**					

Available Test Results
Side Impact Test Summary

Report Filter Settings

Year Range: 1997 - 2000
Make: FORD
Model: ESCORT

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
2501	1997 FORD ESCORT FOUR DOOR SEDAN	2.0	14.0	23.6	50.6	39.2	32.8	46.7	15.9
2482	1997 FORD ESCORT FOUR DOOR SEDAN	2.0	15.5	26.9	114.4	91.9	71.1	107.3	18.7
	Average (AVG)				**82.5**	**65.6**	**52.0**	**77.0**	**17.3**
	Minimum (MIN)				**50.6**	**39.2**	**32.8**	**46.7**	**15.9**
	Maximum (MAX)				**114.4**	**91.9**	**71.1**	**107.3**	**18.7**
	Standard Deviation (STDev-sample)				**45.1**	**37.3**	**27.1**	**42.9**	**2.0**
	Number of Tests (n)			**2**					

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN:	3VWSA81H8VM067343
Model:	1997 Volkswagen Jetta 4 Door
Engine Size:	1.8 L/ 109 cu.in.
Engine Description:	Inline 4 cylinder with Dual Overhead Cam
Horse Power:	150 @ 5700 rpm
Torque:	155 lb-ft at 3200 rpm
Injection System:	Motronic
PSI:	52 psi
Ignition:	electronic
Manufacturer:	Volkswagen
Assembly Plant:	Puebla, Mexico
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Manual Belts, Dual Front Airbags

The First through Third characters (3VW) indicate a Volkswagen Car made in Mexico

The Fourth character (S) indicates a 4 Door

The Fifth character (A) indicates the OEM engine: 1.8 L/ 109 cu.in., L4, DOHC

The Sixth character (8) indicates Manual Belts, Dual Front Airbags

The Seventh and Eighth characters (1H) indicate a Jetta

The Ninth character (the check digit) is entered as 8.
The VIN appears Valid, the calculated value is 8.

The Tenth character (V) indicates the model year 1997

The Eleventh character (M) indicates the vehicle was made in the assembly plant in Puebla, Mexico

The Twelfth through Seventeenth characters (067343) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

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

5/9/2012

1997 VOLKSWAGEN JETTA III 4 DOOR SEDAN

Curb Weight:		2647	lbs.	1201	kg.
Curb Weight Distribution -	Front:	62	% Rear:	38	%
Gross Vehicle Weight Rating:		3682	lbs.	1670	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	173	14.42	4.39
Wheelbase:	97	8.08	2.46
Front Bumper to Front Axle:	33	2.75	0.84
Front Bumper to Front of Front Well:	19	1.58	0.48
Front Bumper to Front of Hood:	4	0.33	0.10
Front Bumper to Base of Windshield:	44	3.67	1.12
Front Bumper to Top of Windshield:	67	5.58	1.70
Rear Bumper to Rear Axle:	43	3.58	1.09
Rear Bumper to Rear of Rear Well:	29	2.42	0.74
Rear Bumper to Rear of Trunk:	5	0.42	0.13
Rear Bumper to Base of Rear Window:	24	2.00	0.61
Width Dimensions			
Maximum Width:	67	5.58	1.70
Front Track:	58	4.83	1.47
Rear Track:	57	4.75	1.45
Vertical Dimensions			
Height:	56	4.67	1.42
Ground to -			
Front Bumper (Top)	19	1.58	0.48
Headlight - center	25	2.08	0.64
Hood - top front:	29	2.42	0.74
Base of Windshield	37	3.08	0.94
Rear Bumper - top:	22	1.83	0.56
Trunk - top rear:	39	3.25	0.99
Base of Rear Window:	41	3.42	1.04

1997 VOLKSWAGEN JETTA III 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	54	4.50	1.37
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	42	3.50	1.07
Rear Seat Shoulder Width	53	4.42	1.35
Rear Seat to Headliner	37	3.08	0.94
Front Leg Room - seatback to floor (min)	27	2.25	0.69

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	396	33.00	10.06
Steering Ratio: 17.79:1			
Wheel Radius:			
Tire Size (OEM): P205/50HR15			

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 pavement):
d = ft t = sec a = ft/sec² G-force =

Acceleration:

0 to 30mph	t =	sec	a =	ft/sec²	G-force =	
0 to 60mph	t =	sec	a =	ft/sec²	G-force =	
45 to 65mph	t =	sec	a =	ft/sec²	G-force =	

Transmission Type: 5spd MANUAL

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 2.5 mph

N.S.D.C = 1995 - 1998

1997 VOLKSWAGEN JETTA III 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.31	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	36.86
Inches in front of rear axle	=	60.14
Inches from side of vehicle	=	33.50
Inches from ground	=	21.98
Inches from front corner	=	77.48
Inches from rear corner	=	108.44
Inches from front bumper	=	69.86
Inches from rear bumper	=	103.14

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	1520.41	lb*ft*sec²
Pitch Moment of Inertia	=	1471.53	lb*ft*sec²
Roll Moment of Inertia	=	326.46	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	68.2	deg
Angle Front of Hood to Windshield Base	=	11.3	deg
Angle Front of Hood to Windshield Top	=	21.6	deg
Angle of Windshield	=	36.5	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 (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

Derived from

NHTSA Crash Test

#2856

1997 VOLKSWAGEN JETTA

Provided By

4N6XPRT StifCalcs®

Registered to:

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

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: **1997 VOLKSWAGEN JETTA III**

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

Year Range	Make	Model	Body Styles	Wheelbase
1993 - 1998	VOLKSWAGEN	JETTA Ⅲ	4D	97.4

Remarks:

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 #	**2856**	NHTSA Test Reference Guide Version #	**V4**			
Test Date	**1997-11-04**	Contract #	**98-5003**			
Contract/Study Title	**CMVSS 212-301 - STUDY OF OCCUPANT**					
Test Objective(s)	**Windshield mounting - Fuel system integrity**					
Test Type	**OTHER**	Configuration	**VEHICLE INTO BARRIER**			
Impact Angle	**0**	Side Impact Point	**0**	mm	**0.0**	inches
		Offset Distance	**0**	mm	**0.0**	inches
		Closing Speed	**47.7**	Km/Hr	**29.64**	MPH
Test Performer	**TRANSPORT CANADA**					
Test Reference #	**TC97-164**					
Test Track Surface	**CONCRETE**	Condition	**DRY**			
Ambient Temperature	**10** C **50.0** F	Total Number of Curves	**48**			
Data Recorder Type	**OTHER**	Data Link	**OTHER**			
Test Commentary	**CANADIAN MVSS COMPLIANCE TEST**					

Fixed Barrier Information

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

1997 VOLKSWAGEN JETTA LEFT FRONT SEAT OCCUPANT

Test #	2856						
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	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N:261
Occupant Commentary	LAST CALIBRATION DATE : 20/MAY/97 POSITION : NEAR

Head

Head to -

Windshielder Header	272	mm	10.7	inches	Head Injury Criteria (HIC)	188			
WindShield	488	mm	19.2	inches	HIC Lower Time Interval (ms)	41.8			
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	77.8			
Side Header	264	mm	10.4	inches					
Side Window	340	mm	13.4	inches					
Neck to Seatback	9999	mm	0.0	inches					

First Contact Region (Head)	AIR BAG
Second Contact Region (Head)	

Chest

Chest to -

Dash	9999	mm	0.0	inches	Arm to Door	184	mm	7.2	inches
Steering Wheel	205	mm	8.1	inches	Hip to Door	251	mm	9.9	inches
Seatback	9999	mm	0.0	inches					

Chest Severity Index	99999	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	52.9

Lap Belt Peak Load	3162	Newtons	710.8	pound Force
Shoulder Belt Peak Load	4738	Newtons	1065.1	pound Force

First Contact Region (Chest/Abdomen)	AIR BAG
Second Contact Region (Chest/Abdomen)	UNKNOWN

Legs

Knees to Dash	66	mm	2.6	inches	Knees to Seatback	9999	mm	0.0	inches
Left Femur Peak Load	-4137	Newtons	-930.0	pounds Force					
Right Femur Peak Load	-3895	Newtons	-875.6	pounds Force					

First Contact Region (Legs)	DASHPANEL
Second Contact Region (Legs)	

1997 VOLKSWAGEN JETTA LEFT FRONT SEAT OCCUPANT

Test #	2856					
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	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N:261
Occupant Commentary	LAST CALIBRATION DATE : 20/MAY/97 POSITION : NEAR

Restraints

Restraint # 1	3 POINT BELT
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS
Restraint # 2	FRONTAL AIRBAG
Mounted	
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

1997 VOLKSWAGEN JETTA RIGHT FRONT SEAT OCCUPANT

Test #	2856						
Vehicle #	1			Sex	FEMALE		
Location	RIGHT 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	OTHER						
Occupant Manufacturer	FIRST TECHNOLOGY						
Occupant Modification	UNMODIFIED						
Occupant Description	S/N:197						
Occupant Commentary	LAST CALIBRATION DATE : 20/MAY/97 POSITION : NEAR						

Head

Head to -

Windshielder Header	239	mm	9.4	inches	Head Injury Criteria (HIC)	198	
WindShield	441	mm	17.4	inches	HIC Lower Time Interval (ms)	33.9	
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	62.8	
Side Header	248	mm	9.8	inches			
Side Window	342	mm	13.5	inches			
Neck to Seatback	9999	mm	0.0	inches			
First Contact Region (Head)	AIR BAG						
Second Contact Region (Head)							

Chest

Chest to -

Dash	326	mm	12.8	inches	Arm to Door	193	mm	7.6	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	212	mm	8.3	inches
Seatback	9999	mm	0.0	inches					
Chest Severity Index	99999				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	49.7			
Lap Belt Peak Load	1685	Newtons	378.8	pound Force					
Shoulder Belt Peak Load	3033	Newtons	681.8	pound Force					
First Contact Region (Chest/Abdomen)	AIR BAG								
Second Contact Region (Chest/Abdomen)	UNKNOWN								

Legs

Knees to Dash	14	mm	0.6	inches	Knees to Seatback	9999	mm	0.0	inches
Left Femur Peak Load	-2800	Newtons	-629.5	pounds Force					
Right Femur Peak Load	-2265	Newtons	-509.2	pounds Force					
First Contact Region (Legs)	DASHPANEL								
Second Contact Region (Legs)									

1997 VOLKSWAGEN JETTA RIGHT FRONT SEAT OCCUPANT

Test #	2856					
Vehicle #	1	Sex	FEMALE			
Location	RIGHT 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	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N:197
Occupant Commentary	LAST CALIBRATION DATE : 20/MAY/97 POSITION : NEAR

Restraints

Restraint # 1	3 POINT BELT
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS
Restraint # 2	FRONTAL AIRBAG
Mounted	
Deployment	DEPLOYED PROPERLY
Restraint Commentary	NO COMMENTS

Vehicle 1 1997 VOLKSWAGEN JETTA

Test #	2856		
VIN	3VWRL81H9VM032853	NHTSA Test Vehicle Number	1
Year	1997	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	VOLKSWAGEN	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	JETTA	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	4400	mm	173.2	inches	CG behind Front Axle	1081	mm	42.6	inches
Vehicle Width	1425	mm	56.1	inches	Center of Damage to CG Axis	737	mm	29.0	inches
Vehicle Wheelbase	2475	mm	97.4	inches	Total Length of Indentation	1475	mm	58.1	inches
Vehicle Test Weight	1453	KG	3203	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	48	kph	29.6	mph

Vehicle Damage Index: 9999999

Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	340	mm	13.4	inches
DPD 2	382	mm	15.0	inches
DPD 3	398	mm	15.7	inches
DPD 4	384	mm	15.1	inches
DPD 5	354	mm	13.9	inches
DPD 6	305	mm	12.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	170.7	inches	156.1	inches	14.5	inches
	4335	mm	3966	mm	369	mm
Centerline	173.1	inches	159.1	inches	14.1	inches
	4397	mm	4040	mm	357	mm
Right Bumper Corner	170.9	inches	157.3	inches	13.6	inches
	4340	mm	3995	mm	345	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
NOT APPLICABLE	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 1997 VOLKSWAGEN JETTA

Test #	2856		
VIN	3VWRL81H9VM032853	NHTSA Test Vehicle Number	1
Year	1997	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	VOLKSWAGEN	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	JETTA	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	UNMODIFIED		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	4400	mm	173.2	inches	CG behind Front Axle	1081	mm	42.6	inches
Vehicle Width	1425	mm	56.1	inches	Center of Damage to CG Axis	737	mm	29.0	inches
Vehicle Wheelbase	2475	mm	97.4	inches	Total Length of Indentation	1475	mm	58.1	inches
Vehicle Test Weight	1453	KG	3203	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	48	kph	29.6	mph

Vehicle Damage Index	9999999	Principal Direction of Force	0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				4397	173.1	4040	159.1				
				Engine Block							
				370	14.6	200	7.9				
4335	170.7	3966	156.1	Front Bumper Corner				4340	170.9	3995	157.3
				Front of Engine							
				4208	165.7	3890	153.1				
3362	132.4	3236	127.4	Firewall				3357	132.2	3214	126.5
				3338	131.4	3316	130.6				
3085	121.5	3075	121.1	Upper Leading Edge of Door				3101	122.1	4397	173.1
3076	121.1	3067	120.7	Lower Leading Edge of Door				3085	121.5	4397	173.1
3069	120.8	3055	120.3	Bottom of 'A' Post				3065	120.7	3051	120.1
2127	83.7	2117	83.3	Upper Trailing Edge of Door				2114	83.2	4397	173.1
2141	84.3	2132	83.9	Lower Trailing Edge of Door				2127	83.7	4397	173.1
				Steering Column							
				2673	105.2	2670	105.1				
				Center of Seering Column to 'A' Post (Horizontal)							
				406	16.0	456	18.0				
				Center of Steering Column to Headliner (Vertical)							
				471	18.5	519	20.4				

1997 VOLKSWAGEN JETTA

NHTSA Crash Test - #2856 - Front Impact

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

Test Vehicle Weight = 3203 pounds
Vehicle Closing Speed = 29.6 mph
Test Crush Length = 56.1 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	14.5	14.1	13.6	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 13.6 inches					217.4
Using a Rated No Damage Speed of	2.5mph	228.3	182.2	143.0	
Using a Rated No Damage Speed of	5.0mph	414.6	150.2	572.0	
Using a Rated No Damage Speed of	7.5mph	558.7	121.3	1287.1	
Using a Rated No Damage Speed of	10.0mph	660.9	95.4	2288.2	
Average Crush = 14.1 inches					202.2
Using a Rated No Damage Speed of	2.5mph	220.2	169.5	143.0	
Using a Rated No Damage Speed of	5.0mph	399.9	139.7	572.0	
Using a Rated No Damage Speed of	7.5mph	538.9	112.8	1287.1	
Using a Rated No Damage Speed of	10.0mph	637.4	88.8	2288.2	
Maximum Crush = 14.5 inches					191.2
Using a Rated No Damage Speed of	2.5mph	214.1	160.3	143.0	
Using a Rated No Damage Speed of	5.0mph	388.8	132.1	572.0	
Using a Rated No Damage Speed of	7.5mph	524.1	106.7	1287.1	
Using a Rated No Damage Speed of	10.0mph	619.8	84.0	2288.2	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	14.5	27.6	-2.0	-7.4

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 24.2

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

1997 VOLKSWAGEN JETTA

NHTSA Crash Test - #2856 - Front Impact

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

Test Vehicle Weight = 3203 pounds
Vehicle Closing Speed = 29.6 mph
Test Crush Length = 58.1 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	14.5	14.1	13.6	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 13.6 inches					210.0
Using a Rated No Damage Speed of	2.5mph	220.6	176.1	138.2	
Using a Rated No Damage Speed of	5.0mph	400.5	145.1	552.6	
Using a Rated No Damage Speed of	7.5mph	539.8	117.2	1243.5	
Using a Rated No Damage Speed of	10.0mph	638.5	92.2	2210.6	
Average Crush = 14.1 inches					195.4
Using a Rated No Damage Speed of	2.5mph	212.7	163.8	138.2	
Using a Rated No Damage Speed of	5.0mph	386.3	135.0	552.6	
Using a Rated No Damage Speed of	7.5mph	520.7	109.0	1243.5	
Using a Rated No Damage Speed of	10.0mph	615.8	85.8	2210.6	
Maximum Crush = 14.5 inches					184.7
Using a Rated No Damage Speed of	2.5mph	206.9	154.9	138.2	
Using a Rated No Damage Speed of	5.0mph	375.6	127.7	552.6	
Using a Rated No Damage Speed of	7.5mph	506.3	103.1	1243.5	
Using a Rated No Damage Speed of	10.0mph	598.8	81.1	2210.6	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	14.5	27.6	-2.0	-7.4

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 24.2

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

1997 VOLKSWAGEN JETTA

NHTSA Crash Test - #2856 - Front Impact

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

Test Vehicle Weight = 3203 pounds
Vehicle Closing Speed = 29.6 MPH
Test Crush Length = 56.1 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	13.4	15.0	15.7	15.1	13.9	12.0	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 12.0 inches					279.2
Using a Rated No Damage Speed of	2.5mph	258.7	234.1	143.0	
Using a Rated No Damage Speed of	5.0mph	469.8	192.9	572.0	
Using a Rated No Damage Speed of	7.5mph	633.2	155.8	1287.1	
Using a Rated No Damage Speed of	10.0mph	749.0	122.6	2288.2	
Average Crush = 14.5 inches					191.2
Using a Rated No Damage Speed of	2.5mph	214.1	160.3	143.0	
Using a Rated No Damage Speed of	5.0mph	388.8	132.1	572.0	
Using a Rated No Damage Speed of	7.5mph	524.1	106.7	1287.1	
Using a Rated No Damage Speed of	10.0mph	619.8	84.0	1453.7	
Maximum Crush = 15.7 inches					163.1
Using a Rated No Damage Speed of	2.5mph	197.8	136.7	143.0	
Using a Rated No Damage Speed of	5.0mph	359.1	112.7	572.0	
Using a Rated No Damage Speed of	7.5mph	484.0	91.0	1287.1	
Using a Rated No Damage Speed of	10.0mph	572.5	71.6	2288.2	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	15.7	28.7	-0.9	-3.2

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 22.4

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

1997 VOLKSWAGEN JETTA

NHTSA Crash Test - #2856 - Front Impact

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

Test Vehicle Weight = 3203 pounds
Vehicle Closing Speed = 29.6 MPH
Test Crush Length = 58.1 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	13.4	15.0	15.7	15.1	13.9	12.0	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 12.0 inches					269.7
Using a Rated No Damage Speed of	2.5mph	250.0	226.1	138.2	
Using a Rated No Damage Speed of	5.0mph	453.9	186.4	552.6	
Using a Rated No Damage Speed of	7.5mph	611.8	150.5	1243.5	
Using a Rated No Damage Speed of	10.0mph	723.6	118.4	2210.6	
Average Crush = 14.5 inches					184.7
Using a Rated No Damage Speed of	2.5mph	206.9	154.9	138.2	
Using a Rated No Damage Speed of	5.0mph	375.6	127.7	552.6	
Using a Rated No Damage Speed of	7.5mph	506.3	103.1	1243.5	
Using a Rated No Damage Speed of	10.0mph	598.8	81.1	1404.4	
Maximum Crush = 15.7 inches					157.6
Using a Rated No Damage Speed of	2.5mph	191.1	132.1	138.2	
Using a Rated No Damage Speed of	5.0mph	346.9	108.9	552.6	
Using a Rated No Damage Speed of	7.5mph	467.6	87.9	1243.5	
Using a Rated No Damage Speed of	10.0mph	553.1	69.2	2210.6	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	15.7	28.7	-0.9	-3.2

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 22.4

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

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 1993 - 1998
Make: VOLKSWAGEN
Model: JETTA III

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
2139	1994 VOLKSWAGEN JETTA FOUR DOOR SEDAN	5.0	21.4	34.9	273.4	76.5	488.4	104.3	22.8
2856	1997 VOLKSWAGEN JETTA FOUR DOOR SEDAN	5.0	14.5	29.6	389.0	132.3	572.0	191.4	24.2
2878	1997 VOLKSWAGEN JETTA FOUR DOOR SEDAN	5.0	7.8	25.2	487.1	251.0	472.6	390.9	32.4
	Average (AVG)				**383.2**	**153.3**	**511.0**	**228.9**	**26.5**
	Minimum (MIN)				**273.4**	**76.5**	**472.6**	**104.3**	**22.8**
	Maximum (MAX)				**487.1**	**251.0**	**572.0**	**390.9**	**32.4**
	Standard Deviation (STDev-sample)				**107.0**	**89.1**	**53.4**	**146.9**	**5.2**
	Number of Tests (n)			**3**					

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 1993 - 1998
Make: VOLKSWAGEN
Model: JETTA III

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
2878	1997 VOLKSWAGEN JETTA FOUR DOOR SEDAN	5.0	16.0	25.2	237.9	59.9	472.6	93.3	15.8
2139	1994 VOLKSWAGEN JETTA FOUR DOOR SEDAN	5.0	22.3	34.9	262.3	70.5	488.4	96.0	21.9
2856	1997 VOLKSWAGEN JETTA FOUR DOOR SEDAN	5.0	15.7	29.6	359.8	113.2	572.0	163.7	22.4
	Average (AVG)				**286.7**	**81.2**	**511.0**	**117.7**	**20.0**
	Minimum (MIN)				**237.9**	**59.9**	**472.6**	**93.3**	**15.8**
	Maximum (MAX)				**359.8**	**113.2**	**572.0**	**163.7**	**22.4**
	Standard Deviation (STDev-sample)				**64.5**	**28.2**	**53.4**	**39.9**	**3.7**
	Number of Tests (n)			**3**					

Stiffness Values and Test Data

Derived from

NHTSA Crash Test

#6274

2008 DODGE GRAND CARAVAN

Provided By

4N6XPRT StifCalcs®

Registered to:

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

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: **2011 CHRYSLER TOWN & COUNTRY**

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

Year Range	Make	Model	Body Styles	Wheelbase
2008 - 2011	CHRYSLER	TOWN & COUNTRY	SW, VAN	121.2, 119.3
Remarks:				
2008 - 2011	DODGE	GRAND CARAVAN		121.2
Remarks:				
2009 - 2011	VOLKSWAGEN	ROUTAN		121.2
Remarks:				

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 #	6274	NHTSA Test Reference Guide Version #	V5			
Test Date	2007-12-21	Contract #	DTNH22-03-D-12005			
Contract/Study Title	NCAP SIDE - 2008 DODGE GRAND CARAVAN SE					
Test Objective(s)	VEHICLE CRASHWORTHINESS AND OCCUPANT RESTRAINT PERFORMANCE DATA					
Test Type	EXPERIMENTAL NEW CAR ASSESSMENT TEST	Configuration	IMPACTOR INTO VEHICLE			
Impact Angle	270	Side Impact Point	N/A	mm	N/A	inches
		Offset Distance	0	mm	0.0	inches
		Closing Speed	62.3	Km/Hr	38.71	MPH
Test Performer	MGA RESEARCH					
Test Reference #	BT07122101					
Test Track Surface	CONCRETE	Condition	DRY			
Ambient Temperature	21 C	69.8 F	Total Number of Curves	134		
Data Recorder Type	OTHER	Data Link	OTHER			
Test Commentary	DTS TDAS PRO ON BOARD DAS					

Fixed Barrier Information

Barrier Type		Pole Barrier Diameter		mm	inches
Barrier Shape					
Barrier Commentary					

2008 DODGE GRAND CARAVAN LEFT FRONT SEAT OCCUPANT

Test #	6274		
Vehicle #	2	Sex	MALE
Location	LEFT FRONT SEAT	Age	0
Position	CENTER POSITION	Height	0 mm 0.0 inches
Type	EUROSID 2 (ES-2RE) SIDE IMPACT DUMMY	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	SIDE IMPACT DUMMY		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 030		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO CURTAIN AIRBAG AND HEADLINER		

Head

Head to -

Windshielder Header	284	mm	11.2	inches	Head Injury Criteria (HIC)	122	
WindShield	568	mm	22.4	inches	HIC Lower Time Interval (ms)	58	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	79.2	
Side Header	239	mm	9.4	inches			
Side Window	382	mm	15.0	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): AIR BAG

Second Contact Region (Head):

Chest

Chest to -

Dash	506	mm	19.9	inches	Arm to Door	133	mm	5.2	inches
Steering Wheel	315	mm	12.4	inches	Hip to Door	160	mm	6.3	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	0
Thoracic Trauma Index	0	Thorax Peak Acceleration (g's)	40.7

Lap Belt Peak Load 0 Newtons 0.0 pound Force

Shoulder Belt Peak Load 0 Newtons 0.0 pound Force

First Contact Region (Chest/Abdomen): NONE

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash 150 mm 5.9 inches Knees to Seatback 0 mm 0.0 inches

Left Femur Peak Load 0 Newtons 0.0 pounds Force

Right Femur Peak Load 0 Newtons 0.0 pounds Force

First Contact Region (Legs): DOOR

Second Contact Region (Legs):

2008 DODGE GRAND CARAVAN LEFT FRONT SEAT OCCUPANT

Test #	6274					
Vehicle #	2	Sex	MALE			
Location	LEFT FRONT SEAT	Age	0			
Position	CENTER POSITION	Height	0	mm	0.0	inches
Type	EUROSID 2 (ES-2RE) SIDE IMPACT DUMMY	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	SIDE IMPACT DUMMY
Occupant Manufacturer	FIRST TECHNOLOGY S/N 030
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO CURTAIN AIRBAG AND HEADLINER

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY
Restraint # 2	CURTAIN AIRBAG
Mounted	HEADER - SIDE
Deployment	DEPLOYED PROPERLY
Restraint Commentary	SECONDARY

2008 DODGE GRAND CARAVAN RIGHT REAR SEAT OCCUPANT

Test #	6274		
Vehicle #	2	Sex	NOT APPLICABLE
Location	RIGHT REAR SEAT	Age	0
Position	FORWARD OF CENTER POSITION	Height	0 mm 0.0 inches
Type	CRABI	Weight	0.0 kg 0 pounds
Size	12 MONTH OLD CHILD		
Calibration Method	PART 572		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 090		
Occupant Modification			
Occupant Description			
Occupant Commentary	HEAD TO DOOR PANEL		

Head

Head to -

Windshielder Header	0	mm	0.0	inches	Head Injury Criteria (HIC)	23	
WindShield	0	mm	0.0	inches	HIC Lower Time Interval (ms)	62.1	
Seatback	536	mm	21.1	inches	HIC Upper Time Interval (ms)	98.1	
Side Header	0	mm	0.0	inches			
Side Window	470	mm	18.5	inches			
Neck to Seatback	0	mm	0.0	inches			
First Contact Region (Head)	SEAT BACK						
Second Contact Region (Head)							

Chest

Chest to -

Dash	0	mm	0.0	inches	Arm to Door	288	mm	11.3	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	303	mm	11.9	inches
Seatback	409	mm	16.1	inches					
Chest Severity Index	0				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	15.9			
Lap Belt Peak Load	0	Newtons	0.0	pound Force					
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force					
First Contact Region (Chest/Abdomen)	NONE								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	0	mm	0.0	inches	Knees to Seatback	175	mm	6.9	inches
Left Femur Peak Load	0	Newtons	0.0	pounds Force					
Right Femur Peak Load	0	Newtons	0.0	pounds Force					
First Contact Region (Legs)	SEAT BACK								
Second Contact Region (Legs)									

2008 DODGE GRAND CARAVAN RIGHT REAR SEAT OCCUPANT

Test #	6274					
Vehicle #	2	Sex	NOT APPLICABLE			
Location	RIGHT REAR SEAT	Age	0			
Position	FORWARD OF CENTER POSITION	Height	0	mm	0.0	inches
Type	CRABI	Weight	0.0	kg	0	pounds
Size	12 MONTH OLD CHILD					

Calibration Method	PART 572
Occupant Manufacturer	FIRST TECHNOLOGY S/N 090
Occupant Modification	
Occupant Description	
Occupant Commentary	HEAD TO DOOR PANEL

Restraints

Restraint # 1	INFANT SAFETY SEAT
Mounted	LAP/SHOULDER BELT, NO TOP TETHER
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY - EVENFLO DISCOVERY WITH BASE
Restraint # 2	5 POINT BELT
Mounted	CHILD SEAT
Deployment	NOT APPLICABLE
Restraint Commentary	SECONDARY - EVENFLO DISCOVERY WITH BASE

2008 DODGE GRAND CARAVAN LEFT REAR SEAT OCCUPANT

Test #	6274		
Vehicle #	2	Sex	NOT APPLICABLE
Location	LEFT REAR SEAT	Age	0
Position	FORWARD OF CENTER POSITION	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	3 YEAR OLD CHILD		
Calibration Method	PART 572		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 031		
Occupant Modification			
Occupant Description			
Occupant Commentary			

Head

Head to -

Windshielder Header	0	mm	0.0	inches	Head Injury Criteria (HIC)	123	
WindShield	0	mm	0.0	inches	HIC Lower Time Interval (ms)	58.1	
Seatback	628	mm	24.7	inches	HIC Upper Time Interval (ms)	87.3	
Side Header	0	mm	0.0	inches			
Side Window	445	mm	17.5	inches			
Neck to Seatback	0	mm	0.0	inches			
First Contact Region (Head)	AIR BAG						
Second Contact Region (Head)							

Chest

Chest to -

Dash	0	mm	0.0	inches	Arm to Door	280	mm	11.0	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	325	mm	12.8	inches
Seatback	578	mm	22.8	inches					
Chest Severity Index	0				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	46.6			
Lap Belt Peak Load	0	Newtons	0.0	pound Force					
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force					
First Contact Region (Chest/Abdomen)	NONE								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	0	mm	0.0	inches	Knees to Seatback	343	mm	13.5	inches
Left Femur Peak Load	0	Newtons	0.0	pounds Force					
Right Femur Peak Load	0	Newtons	0.0	pounds Force					
First Contact Region (Legs)	SEAT BACK								
Second Contact Region (Legs)									

2008 DODGE GRAND CARAVAN LEFT REAR SEAT OCCUPANT

Test #	6274					
Vehicle #	2	Sex	NOT APPLICABLE			
Location	LEFT REAR SEAT	Age	0			
Position	FORWARD OF CENTER POSITION	Height	0	mm	0.0	inches
Type	HYBRID III DUMMY	Weight	0.0	kg	0	pounds
Size	3 YEAR OLD CHILD					

Calibration Method	PART 572
Occupant Manufacturer	FIRST TECHNOLOGY S/N 031
Occupant Modification	
Occupant Description	
Occupant Commentary	

Restraints

Restraint # 1	CONVERTIBLE CHILD SAFETY SEAT, FRONT FACING
Mounted	LATCH - LOWER ANCHORAGES AND TOP TETHER
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY - GRACO SAFE SEAT
Restraint # 2	5 POINT BELT
Mounted	CHILD SEAT
Deployment	NOT APPLICABLE
Restraint Commentary	SECONDARY - GRACO SAFE SEAT

2008 DODGE GRAND CARAVAN LEFT THIRD SEAT OCCUPANT

Test #	6274		
Vehicle #	2	Sex	NOT APPLICABLE
Location	LEFT THIRD SEAT	Age	0
Position	NON-ADJUSTABLE SEAT	Height	0 mm 0.0 inches
Type	HYBRID III DUMMY	Weight	0.0 kg 0 pounds
Size	3 YEAR OLD CHILD		
Calibration Method	PART 572		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 032		
Occupant Modification			
Occupant Description			
Occupant Commentary			

Head

Head to -

Windshielder Header	0	mm	0.0	inches	Head Injury Criteria (HIC)	160	
WindShield	0	mm	0.0	inches	HIC Lower Time Interval (ms)	61.9	
Seatback	436	mm	17.2	inches	HIC Upper Time Interval (ms)	94.2	
Side Header	0	mm	0.0	inches			
Side Window	585	mm	23.0	inches			
Neck to Seatback	0	mm	0.0	inches			
First Contact Region (Head)	AIR BAG						
Second Contact Region (Head)							

Chest

Chest to -

Dash	0	mm	0.0	inches	Arm to Door	196	mm	7.7	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	193	mm	7.6	inches
Seatback	372	mm	14.6	inches					
Chest Severity Index	0				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	32.7			
Lap Belt Peak Load	0	Newtons	0.0	pound Force					
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force					
First Contact Region (Chest/Abdomen)	NONE								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	0	mm	0.0	inches	Knees to Seatback	165	mm	6.5	inches
Left Femur Peak Load	0	Newtons	0.0	pounds Force					
Right Femur Peak Load	0	Newtons	0.0	pounds Force					
First Contact Region (Legs)	SEAT BACK								
Second Contact Region (Legs)									

2008 DODGE GRAND CARAVAN LEFT THIRD SEAT OCCUPANT

Test #	6274					
Vehicle #	2		Sex	NOT APPLICABLE		
Location	LEFT THIRD SEAT		Age	0		
Position	NON-ADJUSTABLE SEAT		Height	0	mm 0.0	inches
Type	HYBRID III DUMMY		Weight	0.0	kg 0	pounds
Size	3 YEAR OLD CHILD					

Calibration Method	PART 572
Occupant Manufacturer	FIRST TECHNOLOGY S/N 032
Occupant Modification	
Occupant Description	
Occupant Commentary	

Restraints

Restraint # 1	CONVERTIBLE CHILD SAFETY SEAT, FRONT FACING
Mounted	LATCH - LOWER ANCHORAGES AND TOP TETHER
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY - GRACO SAFE SEAT
Restraint # 2	5 POINT BELT
Mounted	CHILD SEAT
Deployment	NOT APPLICABLE
Restraint Commentary	SECONDARY - GRACO SAFE SEAT

2008 DODGE GRAND CARAVAN RIGHT THIRD SEAT OCCUPANT

Test #	6274		
Vehicle #	2	Sex	NOT APPLICABLE
Location	RIGHT THIRD SEAT	Age	0
Position	NON-ADJUSTABLE SEAT	Height	0 mm 0.0 inches
Type	CRABI	Weight	0.0 kg 0 pounds
Size	12 MONTH OLD CHILD		
Calibration Method	PART 572		
Occupant Manufacturer	FIRST TECHNOLOGY S/N 093		
Occupant Modification			
Occupant Description			
Occupant Commentary			

Head

Head to -

Windshielder Header	0	mm	0.0	inches	Head Injury Criteria (HIC)	66	
WindShield	0	mm	0.0	inches	HIC Lower Time Interval (ms)	80.2	
Seatback	579	mm	22.8	inches	HIC Upper Time Interval (ms)	116.2	
Side Header	0	mm	0.0	inches			
Side Window	497	mm	19.6	inches			
Neck to Seatback	0	mm	0.0	inches			
First Contact Region (Head)	NONE						
Second Contact Region (Head)							

Chest

Chest to -

Dash	0	mm	0.0	inches	Arm to Door	302	mm	11.9	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	336	mm	13.2	inches
Seatback	483	mm	19.0	inches					
Chest Severity Index	0				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	17			
Lap Belt Peak Load	0	Newtons	0.0	pound Force					
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force					
First Contact Region (Chest/Abdomen)	NONE								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	0	mm	0.0	inches	Knees to Seatback	232	mm	9.1	inches
Left Femur Peak Load	0	Newtons	0.0	pounds Force					
Right Femur Peak Load	0	Newtons	0.0	pounds Force					
First Contact Region (Legs)	SEAT BACK								
Second Contact Region (Legs)									

2008 DODGE GRAND CARAVAN RIGHT THIRD SEAT OCCUPANT

Test #	6274					
Vehicle #	2	Sex	NOT APPLICABLE			
Location	RIGHT THIRD SEAT	Age	0			
Position	NON-ADJUSTABLE SEAT	Height	0	mm	0.0	inches
Type	CRABI	Weight	0.0	kg	0	pounds
Size	12 MONTH OLD CHILD					

Calibration Method	PART 572
Occupant Manufacturer	FIRST TECHNOLOGY S/N 093
Occupant Modification	
Occupant Description	
Occupant Commentary	

Restraints

Restraint # 1	INFANT SAFETY SEAT
Mounted	LAP/SHOULDER BELT, NO TOP TETHER
Deployment	NOT APPLICABLE
Restraint Commentary	PRIMARY - EVENFLO DISCOVERY WITHOUT BASE
Restraint # 2	5 POINT BELT
Mounted	CHILD SEAT
Deployment	NOT APPLICABLE
Restraint Commentary	SECONDARY - EVENFLO DISCOVERY WITHOUT BASE

Vehicle 1 0 NHTSA DEFORMABLE IMPACTOR

Test #	6274		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	0 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description			
Vehicle Commentary	FMVSS 214 DEFORMABLE BARRIER AND IMPACTOR		

Vehicle Length	4115	mm	162.0	inches	CG behind Front Axle	1101	mm	43.3	inches
Vehicle Width	1252	mm	49.3	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2588	mm	101.9	inches	Total Length of Indentation	0	mm	0.0	inches
Vehicle Test Weight	1361	KG	3000	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	62	kph	38.7	mph

Vehicle Damage Index: | Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	0	mm	0.0	inches
DPD 2	0	mm	0.0	inches
DPD 3	0	mm	0.0	inches
DPD 4	0	mm	0.0	inches
DPD 5	0	mm	0.0	inches
DPD 6	0	mm	0.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Centerline	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Right Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm

Bumper Engagement (Inline Impact Only): 27.0

Sill Engagement (Side Impact Only): NOT APPLICABLE

A-pillar Engagement (Side Impact Only): 0.0

Moving Test Cart Angle: NOT APPLICABLE

Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground

Moving Test Cart/Vehicle Crabbed Angle: 27.0

Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle

Vehicle Orientation on Cart Moving Test Cart: NOT APPLICABLE

Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion

Vehicle 1 0 NHTSA DEFORMABLE IMPACTOR

Test #	6274		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine	NOT APPLICABLE		
Displacement	0 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description			
Vehicle Commentary	FMVSS 214 DEFORMABLE BARRIER AND IMPACTOR		

Vehicle Length	4115	mm	162.0	inches	CG behind Front Axle	1101	mm	43.3	inches
Vehicle Width	1252	mm	49.3	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2588	mm	101.9	inches	Total Length of Indentation	0	mm	0.0	inches
Vehicle Test Weight	1361	KG	3000	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	62	kph	38.7	mph

Vehicle Damage Index | Principal Direction of Force: 0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				0	0.0	0	0.0				
				Engine Block							
				0	0.0	0	0.0				
0	0.0	0	0.0	Front Bumper Corner				0	0.0	0	0.0
				Front of Engine							
				0	0.0	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	0.0	Upper Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Bottom of 'A' Post				0	0.0	0	0.0
0	0.0	0	0.0	Upper Trailing Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Trailing Edge of Door				0	0.0	0	0.0
				Steering Column							
				0	0.0	0	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				0	0.0	0	0.0				
				Center of Steering Column to Headliner (Vertical)							
				0	0.0	0	0.0				

Vehicle 2 2008 DODGE GRAND CARAVAN

Test #	6274		
VIN	2D8HN44H08R104776	NHTSA Test Vehicle Number	2
Year	2008	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	DODGE	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	GRAND CARAVAN	Steering Column Collapse Mechanism	UNKNOWN
Body	MINIVAN		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.3 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary			

Vehicle Length	5297	mm	208.5	inches	CG behind Front Axle	1432	mm	56.4	inches
Vehicle Width	1959	mm	77.1	inches	Center of Damage to CG Axis	-279	mm	-11.0	inches
Vehicle Wheelbase	3080	mm	121.3	inches	Total Length of Indentation	3900	mm	153.5	inches
Vehicle Test Weight	2214	KG	4880	pounds	Maximum Static Crush Depth	270	mm	10.6	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index 03LPAW2 Principal Direction of Force 297

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	2	mm	0.1	inches
DPD 2	7	mm	0.3	inches
DPD 3	270	mm	10.6	inches
DPD 4	252	mm	9.9	inches
DPD 5	85	mm	3.3	inches
DPD 6	0	mm	0.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	166.1	inches	165.8	inches	0.3	inches
	4219	mm	4212	mm	7	mm
Centerline	208.5	inches	201.3	inches	7.2	inches
	5297	mm	5114	mm	183	mm
Right Bumper Corner	166.1	inches	166.5	inches	-0.4	inches
	4219	mm	4228	mm	-9	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
27.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
NOT APPLICABLE	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 2 2008 DODGE GRAND CARAVAN

Test #	6274		
VIN	2D8HN44H08R104776	NHTSA Test Vehicle Number	2
Year	2008	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	DODGE	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	GRAND CARAVAN	Steering Column Collapse Mechanism	UNKNOWN
Body	MINIVAN		
Engine	V6 TRANSVERSE FRONT		
Displacement	3.3 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description			
Vehicle Commentary			

Vehicle Length	5297	mm	208.5	inches	CG behind Front Axle	1432	mm	56.4	inches
Vehicle Width	1959	mm	77.1	inches	Center of Damage to CG Axis	-279	mm	-11.0	inches
Vehicle Wheelbase	3080	mm	121.3	inches	Total Length of Indentation	3900	mm	153.5	inches
Vehicle Test Weight	2214	KG	4880	pounds	Maximum Static Crush Depth	270	mm	10.6	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index: 03LPAW2 — Principal Direction of Force: 297

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				5297	208.5	5114	201.3				
				Engine Block							
				0	0.0	0	0.0				
4219	166.1	4212	165.8	Front Bumper Corner				4219	166.1	4228	166.5
				Front of Engine							
				0	0.0	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	0.0	Upper Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Bottom of 'A' Post				0	0.0	0	0.0
0	0.0	0	0.0	Upper Trailing Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Trailing Edge of Door				0	0.0	0	0.0
				Steering Column							
				0	0.0	0	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				0	0.0	0	0.0				
				Center of Steering Column to Headliner (Vertical)							
				0	0.0	0	0.0				

2008 DODGE GRAND CARAVAN

NHTSA Crash Test - #6274 - Side Impact

Damage Profile Distances - Indention Length - KE Equivalent Speed - Trapezoidal Average

Test Vehicle Weight = 4880 pounds
KE Equivalent Speed = 23.9 MPH
Test Crush Length = 153.5 inches

Impactor Weight = 3000
Impactor Test Speed = 38.7

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Rear)	0.1	0.3	10.6	9.9	3.3	0.0	(Front)

			CRASH 3 Stiffness Coefficents			SMAC Stiffness
			A	B	G	Kv
Minimum Crush =	0.1 inches					1453576.1
Using a Rated No Damage Speed of		1.0mph	5830.9	1334410.6	12.7	
Using a Rated No Damage Speed of		2.0mph	11152.2	1220340.8	51.0	
Using a Rated No Damage Speed of		3.0mph	15963.9	1111366.8	114.7	
Using a Rated No Damage Speed of		5.0mph	24058.6	908706.1	318.5	
Average Crush =	4.8 inches					630.9
Using a Rated No Damage Speed of		1.0mph	121.5	579.2	12.7	
Using a Rated No Damage Speed of		2.0mph	232.3	529.7	51.0	
Using a Rated No Damage Speed of		3.0mph	332.6	482.4	114.7	
Using a Rated No Damage Speed of		5.0mph	501.2	394.4	237.2	
Maximum Crush =	10.6 inches					129.4
Using a Rated No Damage Speed of		1.0mph	55.0	118.8	12.7	
Using a Rated No Damage Speed of		2.0mph	105.2	108.6	51.0	
Using a Rated No Damage Speed of		3.0mph	150.6	98.9	114.7	
Using a Rated No Damage Speed of		5.0mph	227.0	80.9	318.5	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	10.6	23.6	-0.3	-1.3

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

Available Test Results
Side Impact Test Summary

Report Filter Settings

Year Range: 2008 - 2011
Make: CHRYSLER
Model: TOWN & COUNTRY

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
6274	2008 DODGE GRAND CARAVAN MINIVAN	2.0	4.8	23.9	230.3	520.4	51.0	619.9	47.1
6175	2008 DODGE GRAND CARAVAN MINIVAN	2.0	6.7	23.9	238.9	389.0	73.4	463.1	34.0
	Average (AVG)				**234.6**	**454.7**	**62.2**	**541.5**	**40.6**
	Minimum (MIN)				**230.3**	**389.0**	**51.0**	**463.1**	**34.0**
	Maximum (MAX)				**238.9**	**520.4**	**73.4**	**619.9**	**47.1**
	Standard Deviation (STDev-sample)				**6.1**	**92.9**	**15.8**	**110.9**	**9.3**
	Number of Tests (n)			**2**					

Available Test Results
Side Impact Test Summary

Report Filter Settings

Year Range: 2008 - 2011
Make: CHRYSLER
Model: TOWN & COUNTRY

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
6274	2008 DODGE GRAND CARAVAN MINIVAN	2.0	10.6	23.9	104.9	108.0	51.0	128.6	21.5
6175	2008 DODGE GRAND CARAVAN MINIVAN	2.0	10.9	23.9	148.2	149.7	73.4	178.2	21.1
	Average (AVG)				**126.6**	**128.9**	**62.2**	**153.4**	**21.3**
	Minimum (MIN)				**104.9**	**108.0**	**51.0**	**128.6**	**21.1**
	Maximum (MAX)				**148.2**	**149.7**	**73.4**	**178.2**	**21.5**
	Standard Deviation (STDev-sample)				**30.6**	**29.5**	**15.8**	**35.1**	**0.3**
	Number of Tests (n)			**2**					

Expert VIN DeCoder®

Version Number 3.1.0.3

DeCoded VIN: 1FAFP6530XK174277

Model:	1999 Ford Contour 4 door Sedan
Engine Size:	2.0L/ 122 cu.in.
Engine Description:	Inline 4 cylinder with Dual Overhead Cam (DOHC)
Horse Power:	130 @ 5500 rpm
Torque:	135lb-ft at 4500 rpm
Injection System:	Sequential Fuel Injection (SFI)
PSI:	37-41 psi
Ignition:	Electronic
Manufacturer:	Ford
Assembly Plant:	Kansas City, MO
Drive Wheels:	This is a Front Wheel Drive vehicle w/ Manual Seatbelts + Driver/Passenger Front Air Bags

The First through Third characters (1FA) indicate a Ford Passenger Car made in the U.S.A.

The Fourth character (F) indicates Manual Seatbelts + Driver/Passenger Front Air Bags

The Fifth through Seventh characters (P65) indicate a Contour and a 4 door Sedan

The Eighth character (3) indicates the OEM engine: 2.0L/ 122 cu.in., L4 DOHC

The Ninth character (the check digit) is entered as 0.
The VIN appears Valid, the calculated value is 0.

The Tenth character (X) indicates the model year 1999

The Eleventh character (K) indicates the vehicle was made in the assembly plant in Kansas City, MO

The Twelfth through Seventeenth characters (174277) indicate the Serial Number and are unique to this vehicle.

Expert AutoStats®

Version 5.2.0.4

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

5/9/2012

1999 FORD CONTOUR 4 DOOR SEDAN

Curb Weight:		2840	lbs.	1288	kg.
Curb Weight Distribution -	Front:	64	% Rear:	36	%
Gross Vehicle Weight Rating:		4079	lbs.	1850	kg.
Number of Tires on Vehicle:		4			
Drive Wheels:		FRONT			

Horizontal Dimensions	Inches	Feet	Meters
Total Length	185	15.42	4.70
Wheelbase:	107	8.92	2.72
Front Bumper to Front Axle:	38	3.17	0.97
Front Bumper to Front of Front Well:	24	2.00	0.61
Front Bumper to Front of Hood:	7	0.58	0.18
Front Bumper to Base of Windshield:	50	4.17	1.27
Front Bumper to Top of Windshield:	81	6.75	2.06
Rear Bumper to Rear Axle:	40	3.33	1.02
Rear Bumper to Rear of Rear Well:	27	2.25	0.69
Rear Bumper to Rear of Trunk:	6	0.50	0.15
Rear Bumper to Base of Rear Window:	24	2.00	0.61
Width Dimensions			
Maximum Width:	69	5.75	1.75
Front Track:	59	4.92	1.50
Rear Track:	59	4.92	1.50
Vertical Dimensions			
Height:	55	4.58	1.40
Ground to -			
Front Bumper (Top)	21	1.75	0.53
Headlight - center	26	2.17	0.66
Hood - top front:	26	2.17	0.66
Base of Windshield	36	3.00	0.91
Rear Bumper - top:	26	2.17	0.66
Trunk - top rear:	39	3.25	0.99
Base of Rear Window:	41	3.42	1.04

1999 FORD CONTOUR 4 DOOR SEDAN

Interior Dimensions	Inches	Feet	Meters
Front Seat Shoulder Width	54	4.50	1.37
Front Seat to Headliner	39	3.25	0.99
Front Leg Room - seatback to floor (max)	42	3.50	1.07
Rear Seat Shoulder Width	53	4.42	1.35
Rear Seat to Headliner	37	3.08	0.94
Front Leg Room - seatback to floor (min)	34	2.83	0.86

Seatbelts: 3pt - front and rear
Airbags: FRONT SEAT AIRBAGS

Steering Data

Turning Circle (Diameter)	432	36.00	10.97
Steering Ratio: 14.50:1			
Wheel Radius:			
Tire Size (OEM): P185/70SR14			

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 pavement):
d = 138.0 ft t = 3.1 sec a = -28.0 ft/sec² G-force = -0.87

Acceleration:

0 to 30mph	t =		sec	a =		ft/sec²	G-force =
0 to 60mph	t =	9.2	sec	a =	9.6	ft/sec²	G-force = 0.30
45 to 65mph	t =		sec	a =		ft/sec²	G-force =

Transmission Type: 5spd MANUAL

Notes:
Federal Bumper Standard Requirements: 2.5 mph
This vehicles Rated Bumper Strength: 5 mph

N.S.D.C = 1998 - 2000

1999 FORD CONTOUR 4 DOOR SEDAN

Other Information

Tip-Over Stability Ratio =	1.37	Stable
NHTSA Star Rating (calculated)		****

Center of Gravity (No Load):

Inches behind front axle	=	38.52
Inches in front of rear axle	=	68.48
Inches from side of vehicle	=	34.50
Inches from ground	=	21.59
Inches from front corner	=	83.94
Inches from rear corner	=	113.83
Inches from front bumper	=	76.52
Inches from rear bumper	=	108.48

Moments of Inertia Approximations (No Load):

Yaw Moment of Inertia	=	1719.20	lb*ft*sec²
Pitch Moment of Inertia	=	1662.60	lb*ft*sec²
Roll Moment of Inertia	=	361.20	lb*ft*sec²

Front Profile Information

Angle Front Bumper to Hood Front	=	35.5	deg
Angle Front of Hood to Windshield Base	=	13.1	deg
Angle Front of Hood to Windshield Top	=	20.0	deg
Angle of Windshield	=	28.7	deg
Angle of Steering Tires at Max Turn	=	28.4	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 (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

Derived from

NHTSA Crash Test

#2871

1997 MERCURY MYSTIQUE

Provided By

4N6XPRT StifCalcs®

Registered to:

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

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: **1999 FORD CONTOUR**

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

Year Range	Make	Model	Body Styles	Wheelbase
1995 - 1997	FORD	CONTOUR	4D	106.5
Remarks:				
1995 - 1997	MERCURY	MYSTIQUE	4D	106.5
Remarks:				
1998 - 2000	FORD	CONTOUR	4D	106.5
Remarks:				
1998 - 2000	MERCURY	MYSTIQUE	4D	106.5
Remarks:				

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 #	2871	NHTSA Test Reference Guide Version #	V4			
Test Date	1997-09-09	Contract #	98-5001			
Contract/Study Title	AIR BAG AGGRESSIVENESS STUDY					
Test Objective(s)	OFFSET FRONTAL CRASH 56 KM/H - 40%					
Test Type	MODIFIED VEHICLE TEST	Configuration	VEHICLE INTO BARRIER			
Impact Angle	0	Side Impact Point	0	mm	0.0	inches
		Offset Distance	N/A	mm	N/A	inches
		Closing Speed	56.5	Km/Hr	35.11	MPH
Test Performer	TRANSPORT CANADA					
Test Reference #	TC97-163					
Test Track Surface	CONCRETE	Condition	DRY			
Ambient Temperature	18 C	64.4 F	Total Number of Curves	49		
Data Recorder Type	OTHER	Data Link	OTHER			
Test Commentary	AIR BAGS DEACTIVATED					

Fixed Barrier Information

Barrier Type	DEFORMABLE	Pole Barrier Diameter	9999	mm	9999 inches
Barrier Shape	OTHER				
Barrier Commentary	EEVC BARRIER (WG11-ECE R94/01) PLASCORE PART # 20670				

1997 MERCURY MYSTIQUE LEFT FRONT SEAT OCCUPANT

Test #	2871		
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	OTHER		
Occupant Manufacturer	FIRST TECHNOLOGY		
Occupant Modification	UNMODIFIED		
Occupant Description	S/N:261		
Occupant Commentary	LAST CALIBRATION DATE : 15/OCT/97 POSITION : NEAR		

Head

Head to -

Windshielder Header	204	mm	8.0	inches	Head Injury Criteria (HIC)	240	
WindShield	414	mm	16.3	inches	HIC Lower Time Interval (ms)	65.8	
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	101.8	
Side Header	253	mm	10.0	inches			
Side Window	345	mm	13.6	inches			
Neck to Seatback	9999	mm	0.0	inches			
First Contact Region (Head)	STEERING WHEEL						
Second Contact Region (Head)							

Chest

Chest to -

Dash	9999	mm	0.0	inches	Arm to Door	125	mm	4.9	inches
Steering Wheel	118	mm	4.6	inches	Hip to Door	153	mm	6.0	inches
Seatback	9999	mm	0.0	inches					
Chest Severity Index	99999				Pelvic Peak Lateral Acceleration (g's)	0			
Thoracic Trauma Index	0				Thorax Peak Acceleration (g's)	31.2			
Lap Belt Peak Load	1523	Newtons	342.4	pound Force					
Shoulder Belt Peak Load	1353	Newtons	304.2	pound Force					
First Contact Region (Chest/Abdomen)	UNKNOWN								
Second Contact Region (Chest/Abdomen)	UNKNOWN								

Legs

Knees to Dash	61	mm	2.4	inches	Knees to Seatback	9999	mm	0.0	inches
Left Femur Peak Load	-3520	Newtons	-791.3	pounds Force					
Right Femur Peak Load	-1645	Newtons	-369.8	pounds Force					
First Contact Region (Legs)	DASHPANEL								
Second Contact Region (Legs)									

1997 MERCURY MYSTIQUE LEFT FRONT SEAT OCCUPANT

Test #	2871					
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	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N:261
Occupant Commentary	LAST CALIBRATION DATE : 15/OCT/97 POSITION : NEAR

Restraints

Restraint # 1	3 POINT BELT
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS
Restraint # 2	UNKNOWN
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS

1997 MERCURY MYSTIQUE RIGHT FRONT SEAT OCCUPANT

Test #	2871		
Vehicle #	1	Sex	FEMALE
Location	RIGHT 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	OTHER		
Occupant Manufacturer	FIRST TECHNOLOGY		
Occupant Modification	UNMODIFIED		
Occupant Description	S/N:197		
Occupant Commentary	LAST CALIBRATION DATE : 15/OCT/97 POSITION : NEAR		

Head

Head to -

Windshielder Header	188	mm	7.4	inches	Head Injury Criteria (HIC)	357	
WindShield	397	mm	15.6	inches	HIC Lower Time Interval (ms)	92.4	
Seatback	9999	mm	0.0	inches	HIC Upper Time Interval (ms)	128.4	
Side Header	243	mm	9.6	inches			
Side Window	338	mm	13.3	inches			

Neck to Seatback 9999 mm 0.0 inches

First Contact Region (Head) STEERING WHEEL

Second Contact Region (Head)

Chest

Chest to -

Dash	306	mm	12.0	inches	Arm to Door	125	mm	4.9	inches
Steering Wheel	9999	mm	0.0	inches	Hip to Door	173	mm	6.8	inches
Seatback	9999	mm	0.0	inches					

Chest Severity Index 99999 — Pelvic Peak Lateral Acceleration (g's) 0

Thoracic Trauma Index 0 — Thorax Peak Acceleration (g's) 31.9

Lap Belt Peak Load 2804 Newtons 630.4 pound Force

Shoulder Belt Peak Load 3002 Newtons 674.9 pound Force

First Contact Region (Chest/Abdomen) UNKNOWN

Second Contact Region (Chest/Abdomen) UNKNOWN

Legs

Knees to Dash 69 mm 2.7 inches — Knees to Seatback 9999 mm 0.0 inches

Left Femur Peak Load -1950 Newtons -438.4 pounds Force

Right Femur Peak Load -823 Newtons -185.0 pounds Force

First Contact Region (Legs) DASHPANEL

Second Contact Region (Legs)

1997 MERCURY MYSTIQUE RIGHT FRONT SEAT OCCUPANT

Test #	2871					
Vehicle #	1	Sex	FEMALE			
Location	RIGHT 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	OTHER
Occupant Manufacturer	FIRST TECHNOLOGY
Occupant Modification	UNMODIFIED
Occupant Description	S/N:197
Occupant Commentary	LAST CALIBRATION DATE : 15/OCT/97 POSITION : NEAR

Restraints

Restraint # 1	3 POINT BELT
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS
Restraint # 2	UNKNOWN
Mounted	
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS

Vehicle 1 1997 MERCURY MYSTIQUE

Test #	2871		
VIN	1MELM6532VK607762	NHTSA Test Vehicle Number	1
Year	1997	Vehicle Modification Indicator	MODIFIED VEHICLE
Make	MERCURY	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	MYSTIQUE	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	AIR BAGS DEACTIVATED		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	4671	mm	183.9	inches	CG behind Front Axle	1086	mm	42.8	inches
Vehicle Width	1783	mm	70.2	inches	Center of Damage to CG Axis	657	mm	25.9	inches
Vehicle Wheelbase	2700	mm	106.3	inches	Total Length of Indentation	1314	mm	51.7	inches
Vehicle Test Weight	1511	KG	3330	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	57	kph	35.1	mph

Vehicle Damage Index: 9999999 — Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	464	mm	18.3	inches
DPD 2	370	mm	14.6	inches
DPD 3	287	mm	11.3	inches
DPD 4	145	mm	5.7	inches
DPD 5	34	mm	1.3	inches
DPD 6	-82	mm	-3.2	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	179.6	inches	181.3	inches	-1.7	inches
	4563	mm	4605	mm	-42	mm
Centerline	183.9	inches	176.1	inches	7.7	inches
	4670	mm	4474	mm	196	mm
Right Bumper Corner	179.4	inches	162.4	inches	17.0	inches
	4558	mm	4125	mm	433	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
NOT APPLICABLE	0.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 1997 MERCURY MYSTIQUE

Test #	2871		
VIN	1MELM6532VK607762	NHTSA Test Vehicle Number	1
Year	1997	Vehicle Modification Indicator	MODIFIED VEHICLE
Make	MERCURY	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	MYSTIQUE	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	FOUR DOOR SEDAN		
Engine	4 CYLINDER TRANSVERSE FRONT		
Displacement	2 Liter	Transmission	AUTOMATIC - FRONT WHEEL DRIVE
Vehicle Modification(s) Description	AIR BAGS DEACTIVATED		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	4671	mm	183.9	inches	CG behind Front Axle	1086	mm	42.8	inches
Vehicle Width	1783	mm	70.2	inches	Center of Damage to CG Axis	657	mm	25.9	inches
Vehicle Wheelbase	2700	mm	106.3	inches	Total Length of Indentation	1314	mm	51.7	inches
Vehicle Test Weight	1511	KG	3330	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	57	kph	35.1	mph

Vehicle Damage Index 9999999 Principal Direction of Force 0

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				4670	183.9	4474	176.1				
				Engine Block							
				181	7.1	177	7.0				
4563	179.6	4605	181.3	Front Bumper Corner				4558	179.4	4125	162.4
				Front of Engine							
				4088	160.9	3920	154.3				
3474	136.8	3245	127.8	Firewall				3458	136.1	3444	135.6
				3628	142.8	3513	138.3				
3201	126.0	3174	125.0	Upper Leading Edge of Door				3204	126.1	3209	126.3
3211	126.4	3189	125.6	Lower Leading Edge of Door				3223	126.9	3226	127.0
3227	127.0	3195	125.8	Bottom of 'A' Post				3225	127.0	3230	127.2
2180	85.8	2156	84.9	Upper Trailing Edge of Door				2154	84.8	2158	85.0
2185	86.0	2162	85.1	Lower Trailing Edge of Door				2164	85.2	2167	85.3
				Steering Column							
				2705	106.5	2688	105.8				
				Center of Seering Column to 'A' Post (Horizontal)							
				436	17.2	395	15.6				
				Center of Steering Column to Headliner (Vertical)							
				481	18.9	524	20.6				

1997 MERCURY MYSTIQUE

NHTSA Crash Test - #2871 - Front Impact

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

Test Vehicle Weight = 3330 pounds
Vehicle Closing Speed = 35.1 mph
Test Crush Length = 70.2 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	-1.7	7.7	17.0	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 0.0 inches					0.0
Using a Rated No Damage Speed of	2.5mph	0.0	0.0	0.0	
Using a Rated No Damage Speed of	5.0mph	0.0	0.0	0.0	
Using a Rated No Damage Speed of	7.5mph	0.0	0.0	0.0	
Using a Rated No Damage Speed of	10.0mph	0.0	0.0	0.0	
Average Crush = 8.1 inches					714.5
Using a Rated No Damage Speed of	2.5mph	382.8	616.4	118.9	
Using a Rated No Damage Speed of	5.0mph	706.9	525.5	475.4	
Using a Rated No Damage Speed of	7.5mph	972.3	441.8	1069.7	
Using a Rated No Damage Speed of	10.0mph	1179.0	365.4	1901.7	
Maximum Crush = 17.0 inches					162.2
Using a Rated No Damage Speed of	2.5mph	182.4	139.9	118.9	
Using a Rated No Damage Speed of	5.0mph	336.8	119.3	475.4	
Using a Rated No Damage Speed of	7.5mph	463.3	100.3	1069.7	
Using a Rated No Damage Speed of	10.0mph	561.7	83.0	1901.7	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	17.0	29.9	-5.2	-17.5

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 29.0

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

1997 MERCURY MYSTIQUE

NHTSA Crash Test - #2871 - Front Impact

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

Test Vehicle Weight = 3330 pounds
Vehicle Closing Speed = 35.1 mph
Test Crush Length = 51.7 inches

Pre/Post Collision Crush Depths (inches)

	Left Side Crush	Centerline Crush	Right Side Crush	
(Driver Side)	-1.7	7.7	17.0	(Pass. Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 0.0 inches					0.0
Using a Rated No Damage Speed of	2.5mph	0.0	0.0	0.0	
Using a Rated No Damage Speed of	5.0mph	0.0	0.0	0.0	
Using a Rated No Damage Speed of	7.5mph	0.0	0.0	0.0	
Using a Rated No Damage Speed of	10.0mph	0.0	0.0	0.0	
Average Crush = 8.1 inches					969.5
Using a Rated No Damage Speed of	2.5mph	519.4	836.4	161.3	
Using a Rated No Damage Speed of	5.0mph	959.2	713.0	645.1	
Using a Rated No Damage Speed of	7.5mph	1319.3	599.5	1451.5	
Using a Rated No Damage Speed of	10.0mph	1599.8	495.9	2580.5	
Maximum Crush = 17.0 inches					220.1
Using a Rated No Damage Speed of	2.5mph	247.5	189.9	161.3	
Using a Rated No Damage Speed of	5.0mph	457.0	161.9	645.1	
Using a Rated No Damage Speed of	7.5mph	628.6	136.1	1451.5	
Using a Rated No Damage Speed of	10.0mph	762.2	112.6	2580.5	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	17.0	29.9	-5.2	-17.5

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 29.0

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

1997 MERCURY MYSTIQUE

NHTSA Crash Test - #2871 - Front Impact

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

Test Vehicle Weight = 3330 pounds
Vehicle Closing Speed = 35.1 MPH
Test Crush Length = 70.2 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	18.3	14.6	11.3	5.7	1.3	-3.2	(Pass Side)

			CRASH 3 Stiffness Coefficents			SMAC Stiffness
			A	B	G	Kv
Minimum Crush =	1.3 inches					27739.0
Using a Rated No Damage Speed of		2.5mph	2385.0	23929.1	118.9	
Using a Rated No Damage Speed of		5.0mph	4404.3	20400.5	475.4	
Using a Rated No Damage Speed of		7.5mph	6057.9	17153.2	1069.7	
Using a Rated No Damage Speed of		10.0mph	7345.8	14187.3	1901.7	
Average Crush =	8.4 inches					664.4
Using a Rated No Damage Speed of		2.5mph	369.1	573.1	118.9	
Using a Rated No Damage Speed of		5.0mph	681.6	488.6	475.4	
Using a Rated No Damage Speed of		7.5mph	937.5	410.8	1069.7	
Using a Rated No Damage Speed of		10.0mph	1136.8	339.8	1322.5	
Maximum Crush =	18.3 inches					140.0
Using a Rated No Damage Speed of		2.5mph	169.4	120.8	118.9	
Using a Rated No Damage Speed of		5.0mph	312.9	102.9	475.4	
Using a Rated No Damage Speed of		7.5mph	430.3	86.6	1069.7	
Using a Rated No Damage Speed of		10.0mph	521.8	71.6	1901.7	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	18.3	31.0	-4.1	-13.3

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 26.9

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

1997 MERCURY MYSTIQUE

NHTSA Crash Test - #2871 - Front Impact

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

Test Vehicle Weight = 3330 pounds
Vehicle Closing Speed = 35.1 MPH
Test Crush Length = 51.7 inches

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Driver Side)	18.3	14.6	11.3	5.7	1.3	-3.2	(Pass Side)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 1.3 inches					37639.8
Using a Rated No Damage Speed of	2.5mph	3236.3	32470.0	161.3	
Using a Rated No Damage Speed of	5.0mph	5976.4	27682.0	645.1	
Using a Rated No Damage Speed of	7.5mph	8220.1	23275.6	1451.5	
Using a Rated No Damage Speed of	10.0mph	9967.7	19251.0	2580.5	
Average Crush = 8.4 inches					901.5
Using a Rated No Damage Speed of	2.5mph	500.9	777.7	161.3	
Using a Rated No Damage Speed of	5.0mph	924.9	663.0	645.1	
Using a Rated No Damage Speed of	7.5mph	1272.2	557.5	1451.5	
Using a Rated No Damage Speed of	10.0mph	1542.6	461.1	1794.6	
Maximum Crush = 18.3 inches					189.9
Using a Rated No Damage Speed of	2.5mph	229.9	163.9	161.3	
Using a Rated No Damage Speed of	5.0mph	424.5	139.7	645.1	
Using a Rated No Damage Speed of	7.5mph	583.9	117.5	1451.5	
Using a Rated No Damage Speed of	10.0mph	708.1	97.1	2580.5	

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, lb/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

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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 Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	18.3	31.0	-4.1	-13.3

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 26.9

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: 1998 - 2000
Make: FORD
Model: CONTOUR

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
2921	1998 FORD CONTOUR FOUR DOOR SEDAN	5.0	17.9	30.4	266.1	75.6	468.6	108.2	20.7
2903	1998 FORD CONTOUR FOUR DOOR SEDAN	5.0	16.4	30.4	306.1	94.7	494.8	135.7	22.5
2852	1997 MERCURY MYSTIQUE FOUR DOOR SEDAN	5.0	13.3	29.5	369.0	136.0	500.6	197.4	26.2
2242	1995 FORD CONTOUR FOUR DOOR SEDAN	5.0	12.2	29.8	378.7	154.0	465.4	222.3	29.2
2154	1995 FORD CONTOUR FOUR DOOR SEDAN	5.0	14.9	34.9	403.8	161.9	503.4	220.6	32.7
2853	1997 MERCURY MYSTIQUE FOUR DOOR SEDAN	5.0	12.0	29.5	411.5	168.8	501.6	244.7	29.2
2708	1998 FORD CONTOUR FOUR DOOR SEDAN	5.0	13.9	35.0	413.8	178.1	480.9	242.4	35.1
2912	1998 FORD CONTOUR FOUR DOOR SEDAN	5.0	14.9	37.8	418.1	184.0	475.0	244.4	38.3
2906	1998 FORD CONTOUR FOUR DOOR SEDAN	5.0	13.3	37.0	476.6	229.7	494.5	307.2	41.2
	Average (AVG)				**382.6**	**153.6**	**487.2**	**213.7**	**30.6**
	Minimum (MIN)				**266.1**	**75.6**	**465.4**	**108.2**	**20.7**
	Maximum (MAX)				**476.6**	**229.7**	**503.4**	**307.2**	**41.2**
	Standard Deviation (STDev-sample)				**63.2**	**46.7**	**14.9**	**60.3**	**6.9**
	Number of Tests (n)			**9**					

Available Test Results
Front Impact Test Summary

Report Filter Settings

Year Range: 1998 - 2000
Make: FORD
Model: CONTOUR

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	Closing Speed (mph)	Vehicle Stiffness A	Vehicle Stiffness B	Vehicle Width Values G	Vehicle Width Values Kv	Crush Factor
2921	1998 FORD CONTOUR FOUR DOOR SEDAN	5.0	21.3	30.4	223.5	53.3	468.6	76.3	17.4
2903	1998 FORD CONTOUR FOUR DOOR SEDAN	5.0	18.3	30.4	274.5	76.1	494.8	109.1	20.2
2912	1998 FORD CONTOUR FOUR DOOR SEDAN	5.0	22.0	37.8	282.5	84.0	475.0	111.6	25.9
2906	1998 FORD CONTOUR FOUR DOOR SEDAN	5.0	20.5	37.0	308.3	96.1	494.5	128.5	26.7
2871	1997 MERCURY MYSTIQUE FOUR DOOR SEDAN	5.0	18.3	35.1	313.4	103.3	475.4	140.5	27.0
2852	1997 MERCURY MYSTIQUE FOUR DOOR SEDAN	5.0	14.4	29.5	338.9	114.7	500.6	166.4	24.0
2242	1995 FORD CONTOUR FOUR DOOR SEDAN	5.0	13.1	29.8	352.5	133.5	465.4	192.7	27.1
2853	1997 MERCURY MYSTIQUE FOUR DOOR SEDAN	5.0	13.1	29.5	376.3	141.2	501.6	204.6	26.7
2154	1995 FORD CONTOUR FOUR DOOR SEDAN	5.0	16.0	34.9	376.9	141.1	503.4	192.2	30.5
2708	1998 FORD CONTOUR FOUR DOOR SEDAN	5.0	15.2	35.0	380.5	150.5	480.9	204.9	32.3
	Average (AVG)				**322.7**	**109.4**	**486.0**	**152.7**	**25.8**
	Minimum (MIN)				**223.5**	**53.3**	**465.4**	**76.3**	**17.4**
	Maximum (MAX)				**380.5**	**150.5**	**503.4**	**204.9**	**32.3**
	Standard Deviation (STDev-sample)				**52.0**	**32.4**	**14.5**	**45.9**	**4.4**
	Number of Tests (n)			**10**					

Stiffness Values and Test Data

Derived from

NHTSA Crash Test

#4426

2003 FORD CROWN VICTORIA

Provided By

4N6XPRT StifCalcs®

Registered to:

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

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: **2006 FORD CROWN VICTORIA**

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

Year Range	Make	Model	Body Styles	Wheelbase
1998 - 2011	LINCOLN	TOWN CAR	2D, 4D	117.4
Remarks: Could use Crown Victoria/Grand Marquis - same basic RWD Chassis, longer WB				
2003 - 2010	FORD	CROWN VICTORIA	4D	114.7, 133
Remarks: REVISED "STIFFER FRAME"				
2003 - 2010	MERCURY	GRAND MARQUIS	2D, 4D, SW	114.7
Remarks: ALSO MARAUDER				

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 #	4426	NHTSA Test Reference Guide Version #	V5			
Test Date	2002-11-12	Contract #	DTNH22-99-D-02041			
Contract/Study Title	NCAP SIDE IMPACT - 2003 FORD CROWN VICTORIA 4 DOOR SEDAN - M30201					
Test Objective(s)	TO GENERATE SIDE IMPACT PERFORMANCE INFORMATION WITH H3 HEAD AND NECK					
Test Type	NEW CAR ASSESSMENT TEST	Configuration	IMPACTOR INTO VEHICLE			
Impact Angle	270	Side Impact Point	75	mm	3.0	inches
		Offset Distance	0	mm	0.0	inches
		Closing Speed	61.8	Km/Hr	38.38	MPH
Test Performer	KARCO ENGINEERING					
Test Reference #	M30201					
Test Track Surface	CONCRETE	Condition	DRY			
Ambient Temperature	19 C	66.2 F	Total Number of Curves	76		
Data Recorder Type	DIGITAL DATA ACQUISITION	Data Link	OTHER			
Test Commentary	NO COMMENTS					

Fixed Barrier Information

Barrier Type		Pole Barrier Diameter		mm	inches
Barrier Shape					
Barrier Commentary					

2003 FORD CROWN VICTORIA LEFT FRONT SEAT OCCUPANT

Test #	4426		
Vehicle #	2	Sex	MALE
Location	LEFT FRONT SEAT	Age	0
Position	CENTER POSITION	Height	0 mm 0.0 inches
Type	SID WITH HYBRID III HEAD/NECK	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	SIDE IMPACT DUMMY		
Occupant Manufacturer	MFG: FTSS, MODEL: SA-SID-M001, S/N: 274		
Occupant Modification	NO COMMENTS		
Occupant Description	SID WITH HIII HEAD AND NECK		
Occupant Commentary	CNTRC1: DOOR PANEL,CNTRL1: DOOR PANEL		

Head

Head to -

Windshielder Header	400	mm	15.7	inches	Head Injury Criteria (HIC)	289	
WindShield	615	mm	24.2	inches	HIC Lower Time Interval (ms)	43.8	
Seatback	0	mm	0.0	inches	HIC Upper Time Interval (ms)	79.7	
Side Header	200	mm	7.9	inches			
Side Window	330	mm	13.0	inches			

Neck to Seatback 0 mm 0.0 inches

First Contact Region (Head): NONE

Second Contact Region (Head):

Chest

Chest to -

Dash	570	mm	22.4	inches	Arm to Door	106	mm	4.2	inches
Steering Wheel	275	mm	10.8	inches	Hip to Door	186	mm	7.3	inches
Seatback	0	mm	0.0	inches					

Chest Severity Index	0	Pelvic Peak Lateral Acceleration (g's)	72
Thoracic Trauma Index	67	Thorax Peak Acceleration (g's)	0

Lap Belt Peak Load 0 Newtons 0.0 pound Force

Shoulder Belt Peak Load 0 Newtons 0.0 pound Force

First Contact Region (Chest/Abdomen): OTHER

Second Contact Region (Chest/Abdomen): NONE

Legs

Knees to Dash 185 mm 7.3 inches Knees to Seatback 0 mm 0.0 inches

Left Femur Peak Load 0 Newtons 0.0 pounds Force

Right Femur Peak Load 0 Newtons 0.0 pounds Force

First Contact Region (Legs): OTHER

Second Contact Region (Legs):

2003 FORD CROWN VICTORIA LEFT FRONT SEAT OCCUPANT

Test #	4426					
Vehicle #	2	Sex	MALE			
Location	LEFT FRONT SEAT	Age	0			
Position	CENTER POSITION	Height	0	mm	0.0	inches
Type	SID WITH HYBRID III HEAD/NECK	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	SIDE IMPACT DUMMY
Occupant Manufacturer	MFG: FTSS, MODEL: SA-SID-M001, S/N: 274
Occupant Modification	NO COMMENTS
Occupant Description	SID WITH HIII HEAD AND NECK
Occupant Commentary	CNTRC1: DOOR PANEL,CNTRL1: DOOR PANEL

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS

2003 FORD CROWN VICTORIA LEFT REAR SEAT OCCUPANT

Test #	4426		
Vehicle #	2	Sex	MALE
Location	LEFT REAR SEAT	Age	0
Position	NON-ADJUSTABLE SEAT	Height	0 mm 0.0 inches
Type	SID WITH HYBRID III HEAD/NECK	Weight	0.0 kg 0 pounds
Size	50 PERCENTILE		
Calibration Method	SIDE IMPACT DUMMY		
Occupant Manufacturer	MFG: FTSS, MODEL: SA-SID-M001, S/N: 275		
Occupant Modification	NO COMMENTS		
Occupant Description	SID WITH HIII HEAD AND NECK		
Occupant Commentary	CNTRC1: DOOR PANEL, CNTRL1: DOOR PANEL		

Head

Head to -

Windshielder Header	0	mm	0.0	inches	Head Injury Criteria (HIC)	248	
WindShield	0	mm	0.0	inches	HIC Lower Time Interval (ms)	51.6	
Seatback	620	mm	24.4	inches	HIC Upper Time Interval (ms)	60.6	
Side Header	202	mm	8.0	inches			
Side Window	323	mm	12.7	inches			
Neck to Seatback	0	mm	0.0	inches			
First Contact Region (Head)	C PILLAR						
Second Contact Region (Head)							

Chest

Chest to -

Dash	0	mm	0.0	inches	Arm to Door	106	mm	4.2	inches
Steering Wheel	0	mm	0.0	inches	Hip to Door	175	mm	6.9	inches
Seatback	537	mm	21.1	inches					
Chest Severity Index	0				Pelvic Peak Lateral Acceleration (g's)	81			
Thoracic Trauma Index	56				Thorax Peak Acceleration (g's)	0			
Lap Belt Peak Load	0	Newtons	0.0	pound Force					
Shoulder Belt Peak Load	0	Newtons	0.0	pound Force					
First Contact Region (Chest/Abdomen)	OTHER								
Second Contact Region (Chest/Abdomen)	NONE								

Legs

Knees to Dash	0	mm	0.0	inches	Knees to Seatback	239	mm	9.4	inches
Left Femur Peak Load	0	Newtons	0.0	pounds Force					
Right Femur Peak Load	0	Newtons	0.0	pounds Force					
First Contact Region (Legs)	OTHER								
Second Contact Region (Legs)									

2003 FORD CROWN VICTORIA LEFT REAR SEAT OCCUPANT

Test #	4426					
Vehicle #	2	Sex	MALE			
Location	LEFT REAR SEAT	Age	0			
Position	NON-ADJUSTABLE SEAT	Height	0	mm	0.0	inches
Type	SID WITH HYBRID III HEAD/NECK	Weight	0.0	kg	0	pounds
Size	50 PERCENTILE					

Calibration Method	SIDE IMPACT DUMMY
Occupant Manufacturer	MFG: FTSS, MODEL: SA-SID-M001, S/N: 275
Occupant Modification	NO COMMENTS
Occupant Description	SID WITH HIII HEAD AND NECK
Occupant Commentary	CNTRC1: DOOR PANEL, CNTRL1: DOOR PANEL

Restraints

Restraint # 1	3 POINT BELT
Mounted	BELT - CONVENTIONAL MOUNT
Deployment	NOT APPLICABLE
Restraint Commentary	NO COMMENTS

Vehicle 1 0 NHTSA DEFORMABLE IMPACTOR

Test #	4426		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine			
Displacement	0 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description	NO COMMENTS		
Vehicle Commentary	NHTSA SIDE IMPACT MOVING DEFORMABLE BARRIER (MDB) 27 DEG. CRAB ANGLE		

Vehicle Length	4120	mm	162.2	inches	CG behind Front Axle	1104	mm	43.5	inches
Vehicle Width	1676	mm	66.0	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2590	mm	102.0	inches	Total Length of Indentation	0	mm	0.0	inches
Vehicle Test Weight	1361	KG	3000	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	62	kph	38.4	mph

Vehicle Damage Index: | Principal Direction of Force: 0

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	0	mm	0.0	inches
DPD 2	0	mm	0.0	inches
DPD 3	0	mm	0.0	inches
DPD 4	0	mm	0.0	inches
DPD 5	0	mm	0.0	inches
DPD 6	0	mm	0.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Centerline	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Right Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
0.0	NOT APPLICABLE	0.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
DIRECT ENGAGEMENT	27.0	NOT APPLICABLE
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 1 0 NHTSA DEFORMABLE IMPACTOR

Test #	4426		
VIN		NHTSA Test Vehicle Number	1
Year	0	Vehicle Modification Indicator	RESEARCH VEHICLE
Make	NHTSA	Post-test Steering Column Shear Capsule Seperation	NOT APPLICABLE
Model	DEFORMABLE IMPACTOR	Steering Column Collapse Mechanism	NOT APPLICABLE
Body	NOT APPLICABLE		
Engine			
Displacement	0 Liter	Transmission	NOT APPLICABLE
Vehicle Modification(s) Description	NO COMMENTS		
Vehicle Commentary	NHTSA SIDE IMPACT MOVING DEFORMABLE BARRIER (MDB) 27 DEG. CRAB ANGLE		

Vehicle Length	4120	mm	162.2	inches	CG behind Front Axle	1104	mm	43.5	inches
Vehicle Width	1676	mm	66.0	inches	Center of Damage to CG Axis	0	mm	0.0	inches
Vehicle Wheelbase	2590	mm	102.0	inches	Total Length of Indentation	0	mm	0.0	inches
Vehicle Test Weight	1361	KG	3000	pounds	Maximum Static Crush Depth	0	mm	0.0	inches
					Pre-Impact Speed	62	kph	38.4	mph
Vehicle Damage Index					Principal Direction of Force	0			

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				0	0.0	0	0.0				
				Engine Block							
				0	0.0	0	0.0				
0	0.0	0	0.0	Front Bumper Corner				0	0.0	0	0.0
				Front of Engine							
				0	0.0	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	0.0	Upper Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Bottom of 'A' Post				0	0.0	0	0.0
0	0.0	0	0.0	Upper Trailing Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Trailing Edge of Door				0	0.0	0	0.0
				Steering Column							
				0	0.0	0	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				0	0.0	0	0.0				
				Center of Steering Column to Headliner (Vertical)							
				0	0.0	0	0.0				

Vehicle 2 2003 FORD CROWN VICTORIA

Test #	4426		
VIN	2FAFP73W83X109154	NHTSA Test Vehicle Number	2
Year	2003	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	FORD	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	CROWN VICTORIA	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V8 INLINE FRONT		
Displacement	4.6 Liter	Transmission	AUTOMATIC - REAR WHEEL DRIVE
Vehicle Modification(s) Description	NO COMMENTS		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	5427	mm	213.7	inches	CG behind Front Axle	1409	mm	55.5	inches
Vehicle Width	1976	mm	77.8	inches	Center of Damage to CG Axis	-449	mm	-17.7	inches
Vehicle Wheelbase	2909	mm	114.5	inches	Total Length of Indentation	3300	mm	129.9	inches
Vehicle Test Weight	2105	KG	4640	pounds	Maximum Static Crush Depth	468	mm	18.4	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index: 10LPAW3

Principal Direction of Force: 297

Damage Profile Distance Measurements

(Measured Left-to-Right, Rear-to-Front)

DPD 1	80	mm	3.1	inches
DPD 2	303	mm	11.9	inches
DPD 3	374	mm	14.7	inches
DPD 4	434	mm	17.1	inches
DPD 5	182	mm	7.2	inches
DPD 6	25	mm	1.0	inches

Crush from Pre & Post Test Damage Measurements

	Pre-Test		Post-Test		Crush Depth	
Left Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Centerline	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm
Right Bumper Corner	0.0	inches	0.0	inches	0.0	inches
	0	mm	0	mm	0	mm

Bumper Engagement (Inline Impact Only)	Sill Engagement (Side Impact Only)	A-pillar Engagement (Side Impact Only)
27.0	DIRECT ENGAGEMENT	90.0

Moving Test Cart Angle	Moving Test Cart/Vehicle Crabbed Angle	Vehicle Orientation on Cart Moving Test Cart
NOT APPLICABLE	0.0	DIRECT ENGAGEMENT
Magnitude of the Tilt Angle Measured between surface of a Rollover Test Cart and the Ground	*Magniture of the Crabbed Angle Measure Clockwise from Longitudinal Vector to Velocity Vector of Vehicle*	*Magnitude of the Angle Measured between the Vehicle Orientation and Direction of Test Cart Motion*

Vehicle 2 2003 FORD CROWN VICTORIA

Test #	4426		
VIN	2FAFP73W83X109154	NHTSA Test Vehicle Number	2
Year	2003	Vehicle Modification Indicator	PRODUCTION VEHICLE
Make	FORD	Post-test Steering Column Shear Capsule Seperation	UNKNOWN
Model	CROWN VICTORIA	Steering Column Collapse Mechanism	UNKNOWN
Body	FOUR DOOR SEDAN		
Engine	V8 INLINE FRONT		
Displacement	4.6 Liter	Transmission	AUTOMATIC - REAR WHEEL DRIVE
Vehicle Modification(s) Description	NO COMMENTS		
Vehicle Commentary	NO COMMENTS		

Vehicle Length	5427	mm	213.7	inches	CG behind Front Axle	1409	mm	55.5	inches
Vehicle Width	1976	mm	77.8	inches	Center of Damage to CG Axis	-449	mm	-17.7	inches
Vehicle Wheelbase	2909	mm	114.5	inches	Total Length of Indentation	3300	mm	129.9	inches
Vehicle Test Weight	2105	KG	4640	pounds	Maximum Static Crush Depth	468	mm	18.4	inches
					Pre-Impact Speed	0	kph	0.0	mph

Vehicle Damage Index	10LPAW3	Principal Direction of Force	297

Pre & Post Test Damage Measurements

(Measurements are taken in a longitudinaldirection. Except for Engine Block, all measurements are take from 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							
				0	0.0	0	0.0				
				Engine Block							
				0	0.0	0	0.0				
0	0.0	0	0.0	Front Bumper Corner				0	0.0	0	0.0
				Front of Engine							
				0	0.0	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	0.0	Upper Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Leading Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Bottom of 'A' Post				0	0.0	0	0.0
0	0.0	0	0.0	Upper Trailing Edge of Door				0	0.0	0	0.0
0	0.0	0	0.0	Lower Trailing Edge of Door				0	0.0	0	0.0
				Steering Column							
				0	0.0	0	0.0				
				Center of Seering Column to 'A' Post (Horizontal)							
				0	0.0	0	0.0				
				Center of Steering Column to Headliner (Vertical)							
				0	0.0	0	0.0				

2003 FORD CROWN VICTORIA

NHTSA Crash Test - #4426 - Side Impact

Damage Profile Distances - Indention Length - KE Equivalent Speed - Trapezoidal Average

Test Vehicle Weight =	4640 pounds	Impactor Weight =	3000
KE Equivalent Speed =	24.1 MPH	Impactor Test Speed =	38.4
Test Crush Length =	129.9 inches		

Damage Profile Distance Collision Crush Depths (inches)

	DPD1	DPD2	DPD3	DPD4	DPD5	DPD6	
(Rear)	3.1	11.9	14.7	17.1	7.2	1.0	(Front)

		CRASH 3 Stiffness Coefficents			SMAC Stiffness
		A	B	G	Kv
Minimum Crush = 1.0 inches					16561.1
Using a Rated No Damage Speed of	1.0mph	659.9	15212.6	14.3	
Using a Rated No Damage Speed of	2.0mph	1262.6	13921.4	57.3	
Using a Rated No Damage Speed of	3.0mph	1808.0	12687.4	128.8	
Using a Rated No Damage Speed of	5.0mph	2727.1	10391.2	357.9	
Average Crush = 10.6 inches					147.4
Using a Rated No Damage Speed of	1.0mph	62.3	135.4	14.3	
Using a Rated No Damage Speed of	2.0mph	119.1	123.9	57.3	
Using a Rated No Damage Speed of	3.0mph	170.6	112.9	128.8	
Using a Rated No Damage Speed of	5.0mph	257.3	92.5	267.1	
Maximum Crush = 17.1 inches					56.6
Using a Rated No Damage Speed of	1.0mph	38.6	52.0	14.3	
Using a Rated No Damage Speed of	2.0mph	73.8	47.6	57.3	
Using a Rated No Damage Speed of	3.0mph	105.7	43.4	128.8	
Using a Rated No Damage Speed of	5.0mph	159.5	35.5	357.9	

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, lb/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

KE Speed (mph) = SQRT(30 * CF * max crush in feet)

Crush Factor	Maximum Crush (inches)	Calculated KE Speed (mph)	Calculated Error (mph)	Calculated Error (%)
21	17.1	30.0	5.9	19.7

4N6XPRT Systems Specific Crush Factor (CF Specific to this test) = 13.5

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

Available Test Results
Side Impact Test Summary

Report Filter Settings

Year Range: 2003 - 2010
Make: FORD
Model: CROWN VICTORIA

Test Number	Vehicle Info	No Damage Speed (mph)	Average Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
4426	2003 FORD CROWN VICTORIA FOUR DOOR SEDAN	2.0	10.6	24.1	119.2	124.0	57.3	147.5	21.8
4427	2003 LINCOLN TOWN CAR FOUR DOOR SEDAN	2.0	10.1	23.6	128.5	137.7	59.9	164.5	22.1
2989	1999 LINCOLN TOWN CAR FOUR DOOR SEDAN	2.0	8.7	24.0	150.6	189.8	59.8	225.8	26.4
	Average (AVG)				**132.8**	**150.5**	**59.0**	**179.3**	**23.4**
	Minimum (MIN)				**119.2**	**124.0**	**57.3**	**147.5**	**21.8**
	Maximum (MAX)				**150.6**	**189.8**	**59.9**	**225.8**	**26.4**
	Standard Deviation (STDev-sample)				**16.1**	**34.7**	**1.5**	**41.2**	**2.6**
	Number of Tests (n)			**3**					

Available Test Results
Side Impact Test Summary

Report Filter Settings

Year Range: 2003 - 2010
Make: FORD
Model: CROWN VICTORIA

Test Number	Vehicle Info	No Damage Speed (mph)	Max Crush (inch)	KEES (mph)	Indention Stiffness A	Indention Stiffness B	Length Values G	Length Values Kv	Crush Factor
2989	1999 LINCOLN TOWN CAR FOUR DOOR SEDAN	2.0	20.0	24.0	65.9	36.4	59.8	43.3	11.6
4426	2003 FORD CROWN VICTORIA FOUR DOOR SEDAN	2.0	18.4	24.1	68.5	41.0	57.3	48.8	12.6
4427	2003 LINCOLN TOWN CAR FOUR DOOR SEDAN	2.0	17.1	23.6	75.6	47.7	59.9	57.0	13.0
	Average (AVG)				**70.0**	**41.7**	**59.0**	**49.7**	**12.4**
	Minimum (MIN)				**65.9**	**36.4**	**57.3**	**43.3**	**11.6**
	Maximum (MAX)				**75.6**	**47.7**	**59.9**	**57.0**	**13.0**
	Standard Deviation (STDev-sample)				**5.0**	**5.7**	**1.5**	**6.9**	**0.7**
	Number of Tests (n)			**3**					

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

Dear Conference Attendee,

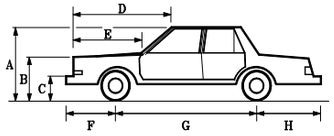
We at 4N6XPRT Systems were pleased to be able to provide you with the preceding data for the crash test vehicles.

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.



Expert AutoStats®

Expert AutoStats® is a program that has over 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.

********** | PARTIAL OUTPUT | **********

2001 FORD CROWN VICTORIA 4DR SEDAN

[HORIZONTAL DIMENSIONS]		[VERTICAL DIMENSIONS]	
LENGTH	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	26 in.
FRONT BUMPER TO TOP OF WINDSHIELD	91 in.	BASE OF WINDSHIELD	38 in.
FRONT BUMPER TO FRONT WELL	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	37 in.		
REAR BUMPER TO REAR AXLE	53 in.		
		[WEIGHT DIMENSIONS]	
		CURB WEIGHT	3920 lbs.
[DEPTH DIMENSIONS]		Curb Weight Distribution:	
		FRONT = 55%	REAR = 45%
WIDTH	78 in.		
FRONT TRACK	63 in.		
REAR TRACK	64 in.	GROSS VEHICLE WEIGHT	5170 lbs.

EXPERT AUTOSTATS(c) Reg.To:4N6XPRT Systems S/N:01R-930512AQ03201

2001 FORD CROWN VICTORIA 4DR SEDAN

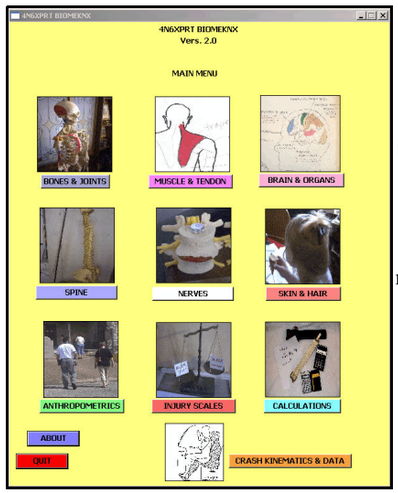
[ACCELERATION/BRAKING]			
ACCELERATION 0-30 mph	16.9 ft/sec/sec	BUMPER STRENGTH:	5 mph
ACCELERATION 0-60 mph	11.1 ft/sec/sec	STEERING RATIO	16.40:1
ACCELERATION 45-65 mph	6.8 ft/sec/sec		
BRAKING 60-0 mph	133 ft	[INTERIOR DIMENSIONS]	
		FRONT SHOULDER ROOM	61 in.
DRIVE WHEELS	REAR	FRONT HEAD ROOM	39 in.
TURNING CIRCLE (DIAMETER)	41 ft.	FRONT LEG ROOM	43 in.
NUMBER OF WHEELS	4	REAR SHOULDER ROOM	60 in.
WHEEL RADIUS	13 in.	REAR HEAD ROOM	38 in.
TIRE SIZE	P225/60SR16	REAR LEG ROOM	40 in.

ALL DISC - REAR ABS - OPTIONAL
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-930512AQ03201

4N6XPRT BioMeknx™



Collecting the Biomechanical data of importance to the Accident Investigator into one easily accessible reference location

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.

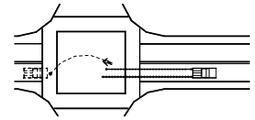
Expert VIN DeCoder®

3FAPP1280MR117253

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	Chevrolet/Geo
Mercury/Lincoln	Pontiac / Buick / Oldsmobile
Chrysler/AMC/Jeep	Cadillac/Saturn
European Import	Asian Import



4N6XPRT Ped & Bike Calcs®

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.

Expert Qwic Calcs®

>>>Calculate Time given D & V<<<
Enter Distance (in feet) : 45
Enter Velocity (in mph) : 6

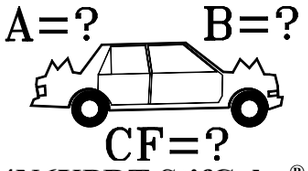
Expert Qwic Calcs® quickly provides answers to questions important in vehicle collision litigation. The user inputs data in response to relevant questions, Expert Qwic Clacs® performs the mathematical calculations required. Both the input data and the calculated result are then displayed, and may be "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®

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":

1) Sister/Clone Reader -

(a) - Select YEAR (b) - Select Manufacturer
(c) - Select Model

▼

2) Click on TEST SELECTION Tab

▼

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

▼

4) View TEST INFORMATION

▼

5) View OCCUPANT DATA

▼

6) View VEHICLE DATA

▼

7) View STIFFNESS CALCS

▼

8) 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.

Contact Name:_____

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

←Visa/MasterCard | Security | American Express →

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: _____

PROGRAM ORDER FORM:

(Pricing effective as of 5/20/11 - prices subject to change without notice)

Expert AutoStats®:	$ 595.00 *	$_____
4N6XPRT BioMeknx™:	$ 495.00 *	$_____
4N6XPRT Ped & Bike Calcs®:	$ 375.00 *	$_____
Expert Qwic Calcs®:	$ 275.00 *	$_____
Expert TireStuf®:	$ 85.00 *	$_____
4N6XPRT StifCalcs®:	$ 600.00 *	$_____
Expert VIN DeCoder®:	$ 525.00 *	$_____
	SUB-TOTAL	$_____
Handling **:		$_____

(Cash or Check with order = $5.00, Credit Card = $10.00 , Govt. Purchase Order = $15.00)

Notarized Affidavit Filing Requirement $_____

($25.00 per required Notarized Signature)

Normal delivery is via electronic download

☐ - Deliver via electronic download link (e-mail address required) $ 0.00

☐ - Deliver on USB - **additional cost of $35.00 / disk / program** $_____

SUB-TOTAL $_____

California shipping addresses add **9.50%** sales tax $_____

(*California orders delivered electronically **DO NOT** owe sales tax*)

TOTAL $_____

Individual Vehicle Data FAX/Order Form

☐ **Expert VIN Decoder & Expert AutoStats**
☐ **NHTSA Crash Test Results**
☐ **BOTH**
Please circle ALL OPTIONS that apply

YEAR & MAKE:_____

MODEL:_____ _____

If you 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
PICKUPS:Dual Rear Wheel - 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
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*

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

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 **N**o **S**ignificant **D**imensional **C**hanges VIN DeCoding when VIN is provided Information available

Mid-60's to present **also includes** (*when available*)

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:

Expert Systems Software Programs for Litigation

Expert AutoStats®
4N6XPRT StifCalcs®
4N6XPRT BioMeknx™
4N6XPRT Ped & Bike Calcs®
Expert Qwic Calcs®
Expert TireStuf®
Expert VIN DeCoder®

Vehicle Data Service

Individual Vehicle Data Search Service®

_____

8387 University Avenue, Suite P
La Mesa, CA 91942-9342

Phone: 1-800-266-9778
Fax: **(619) 464-2206**
E-Mail: **4n6@4n6xprt.com**

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

Expert VIN DeCoder®

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

Modules: 1981 to Present
Control Module - One Required per Set

Ford Cars (includes Festiva & Merkur)
Mercury/Lincoln Cars
Ford vans/Utility/Lt. Trucks

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 co-processor 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.

PLEASE PRINT

Contact Name:_____
Company/Dept:_____
Mailing Address:_____
City:_____State:____Zip:_____
Phone:_____
Fax:_____
E-Mail:_____

Expert VIN DeCoder®
_____ (copies) x $525.00 . . . . . = $_____
Handling **: $_____
(Check with order = $5.00, Credit Card = $10.00 , Govt. P.O.r = $15.00)
Notarized Affidavit Filing Requirement $_____
($25.00 per required Notarized Signature)

Normal delivery is via electronic download
☐ - Deliver via electronic download link (e-mail address required) $ 0.00
☐ Please deliver on USB at an
additional cost of $35.00 per disk $_____
SUB-TOTAL = $_____
CA Addresses add 9.50% sales tax . . . . = $_____
*(California orders delivered by e-mail attachment **DO NOT** owe sales tax)*
TOTAL = $_____

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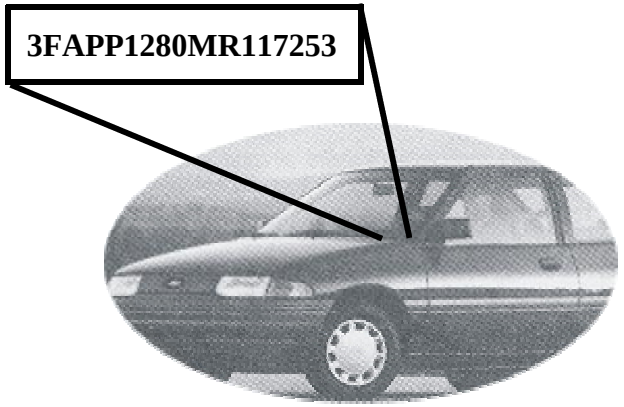
Check*/Money Order:___ Credit Card:___ P.O.:___
Please make check*/M.O./P.O. payable to:
4N6XPRT Systems®
Credit Card Orders:
MasterCard:___ Visa:___ Am.Ex.:___
Card #:_____
Expires:_____
Name on Card: _____
Signature: _____
Billing Add. #: _____
Billing Zip: _____

Mail to: 4N6XPRT Systems®
8387 University Avenue
La Mesa, CA 91942-9342
Telephone Orders:
Monday-Friday - 9:30am-5:00pm PST
Phone: (619) 464-3478 Fax: (619) 464-2206

Orders will be shipped Priority Mail within 10 working days of receipt of order.
Prices subject to change WITHOUT NOTICE.
** Checks MUST be drawn from a bank in the U.S.A.*

Expert VIN DeCoder®



User Friendly Software to provide interpretation of the 17 character VIN Number on Cars, Lt. Pickups, Utility Vehicles, and Vans.

4N6XPRT Systems®
Forensic Expert Software
8387 University Avenue
La Mesa, CA 91942-9342

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

1-800-266-9778

Expert VIN DeCoder® example

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®

The Expert AutoStats® program contains data on more than 42,000 cars, pick-ups, vans, and utility vehicles that range in years from the 1940's to the present. The Expert AutoStats® base information can assist in reconstructing accidents when the data for the vehicle is unavailable or the vehicle is too severely damaged to get correct measurements. The program is currently relied upon by over 700 private and 300 Government entities within the United States for this very purpose. Additionally, for many vehicles mid-1960's to present, data such as bumper height, front and rear overhang, hood height, etc., are also included.

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 co-processor 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.

PLEASE PRINT

Contact Name:_____
Company/Dept:_____
Mailing Address:_____
City:State:Zip:_____
Phone: _____
Fax: _____
E-Mail:_____

AutoStats® _____ (copies) x $595.00 . . = $_____
Handling **: $_____
(Check with order = $5.00, Credit Card = $10.00 , Govt. P.O.r = $15.00)
Notarized Affidavit Filing Requirement $_____
($25.00 per required Notarized Signature)

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SUB-TOTAL = $_____

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TOTAL = $_____

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Check*/Money Order:___ Credit Card:___ P.O.:___
Please make check*/M.O./P.O. payable to:
4N6XPRT Systems®

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Card #:_____
Expires:_____Sec.Code:_____
Name on Card: _____
Signature: _____
Billing Add. : _____
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La Mesa, CA 91942-9342

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Phone: (619) 464-3478 Fax: (619) 464-2206

Orders will be shipped Priority Mail within 10 working days of receipt of order.
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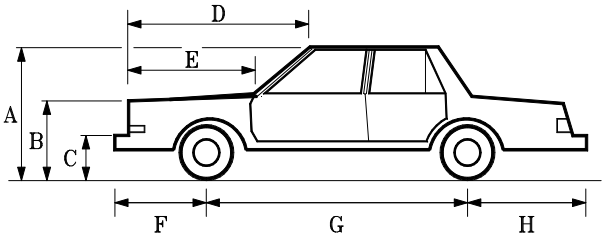
** Checks MUST be drawn from a bank in the U.S.A.*

Expert AutoStats®



Over 42,000 cars, pick-ups, vans, and utility vehicles 1940's to the present are represented.

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Forensic Expert Software
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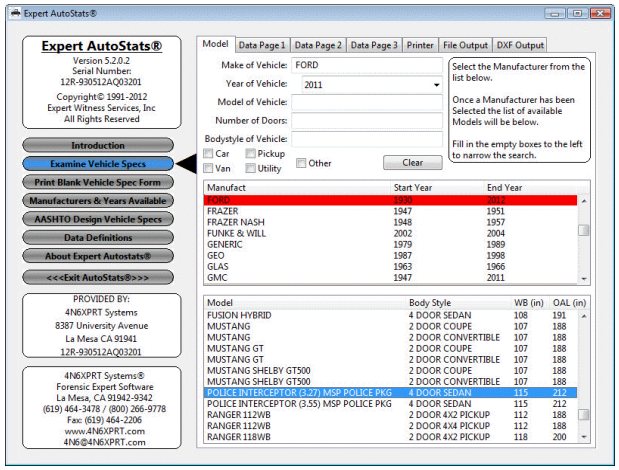
La Mesa, CA 91942-9342

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

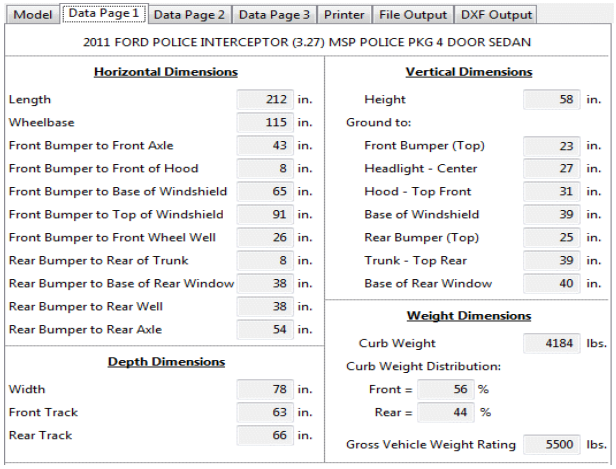
1-800-266-9778

Select Your Vehicle



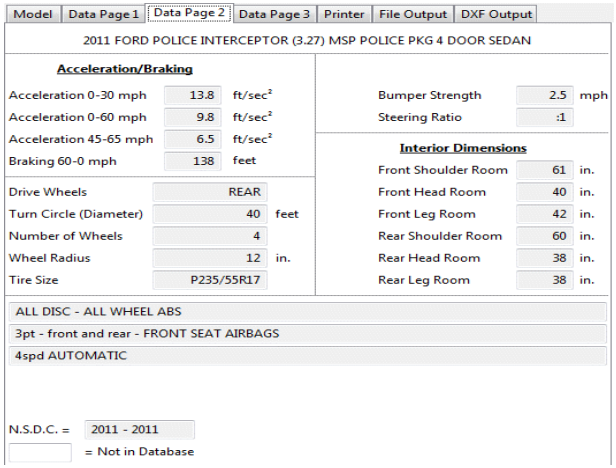
After typing in the Make, Year, and Type of vehicle, you are presented with the vehicles which are available for that year.

Screen 1



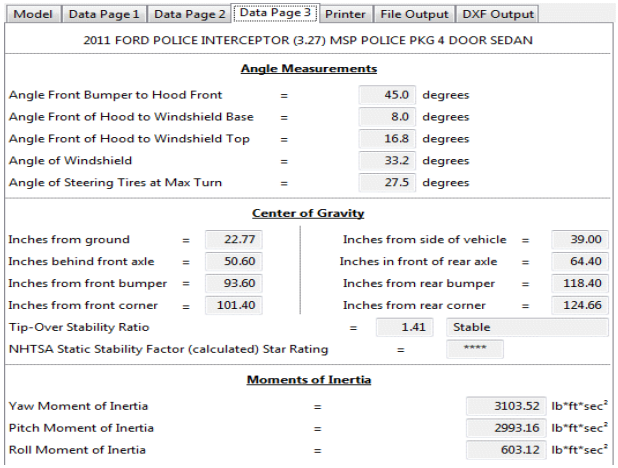
The first screen of data contains exterior dimensions and weight data. Length, Height, Wheelbase, Width, and Weight Distribution are published dimensions. Curb Weight is an average of published curb weights for the given vehicle. Detail dimensions such as the bumper heights and Front Bumper to Front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

Screen 2



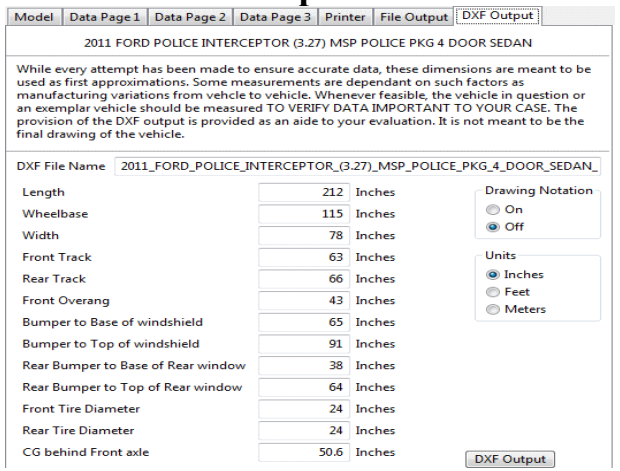
The second screen of data contains interior dimensions and various performance data. The data contained in the second screen comes from various published sources.

Screen 3



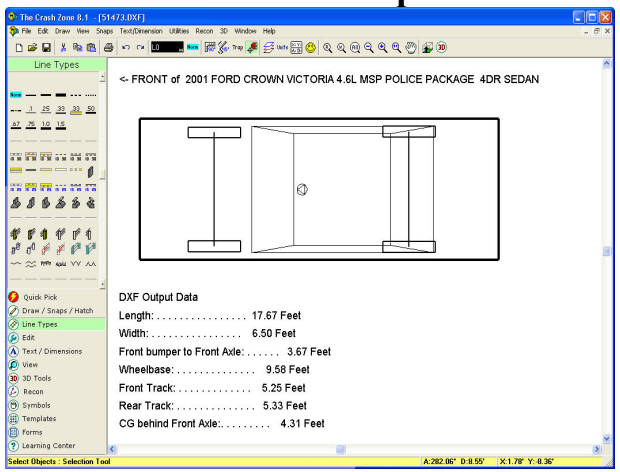
The third and last screen contains a number of calculated items of information which may be of use depending upon the type of case, the other software that you use, and the questions which need to be answered.

DXF Output Screen



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



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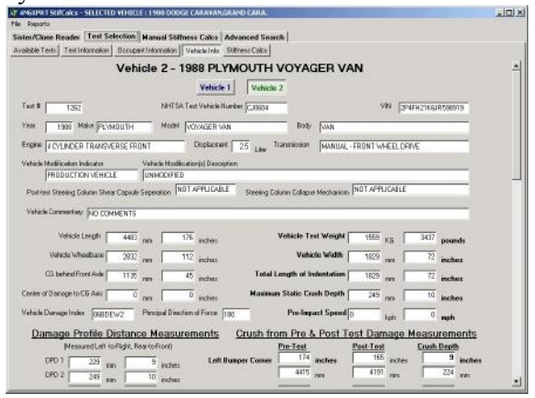
In addition to the NHTSA Crash Test data, the program includes a "Sister/Clone List Reader" developed in cooperation with Greg Anderson. This allows quick retrieval of the "Sister/Clone" data for the desired vehicle. This will drive the initial selection of the available tests. Alternatively, we have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



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

▼

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

▼

4) View TEST INFORMATION

▼

5) View OCCUPANT DATA

▼

6) View VEHICLE DATA

▼

7) View STIFFNESS CALCS

▼

8) Click on Reports - PRINT REPORT

IT'S THAT SIMPLE .... REALLY!!

PLEASE PRINT

Contact Name: _____
Company/Dept: _____
Mailing Address: _____
City:State:Zip: _____
Phone: _____
Fax: _____
E-Mail: _____
(E-mail address required for electronic delivery)

StifCalcs®_____ (copies) x $600.00 . . = $_____
Handling **: $_____
(Check with order = $5.00, Credit Card = $10.00 , Govt. P.O.r = $15.00)
Notarized Affidavit Filing Requirement $_____
($25.00 per required Notarized Signature)

Normal delivery is via electronic download
☐ - Deliver via electronic download link (e-mail address required) $ 0.00
☐ Please deliver on USB at an
additional cost of $35.00 per disk $_____
SUB-TOTAL = $_____
CA Addresses add 9.50% sales tax . . = $_____
(*California orders delivered by e-mail attachment **DO NOT** owe sales tax*)

TOTAL = $_____

Enclosed is:
Check/M. O. :___ Credit Card:___ P.O.:___

Please make check/M.O./P.O. payable to:
4N6XPRT Systems®
Credit Card Orders:
MasterCard:___ Visa:___ Am.Ex.:___
Card #: _____
Expires: _____
Name on Card: _____
Signature: _____
Billing Add. #: _____
Billing Zip: _____

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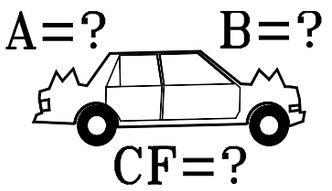
*Orders outside of U.S.A. shipped via E-Mail attachment **ONLY**.*

4N6XPRT StifCalcs®



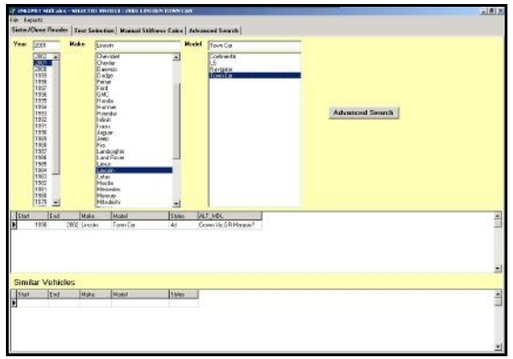
Quick, Convenient, Easy access to the NHTSA Crash Test data on your own MS-Windows computer without the need for an internet connection.

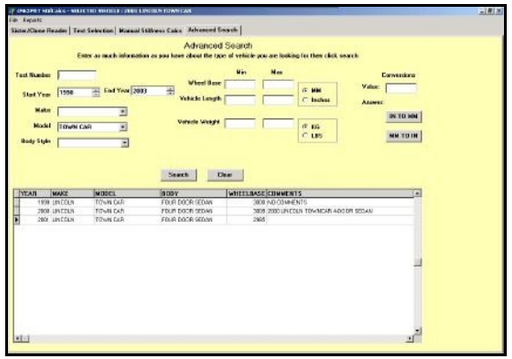
4N6XPRT Systems®
Forensic Expert Software
8387 University Avenue
La Mesa, CA 91942-9342

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

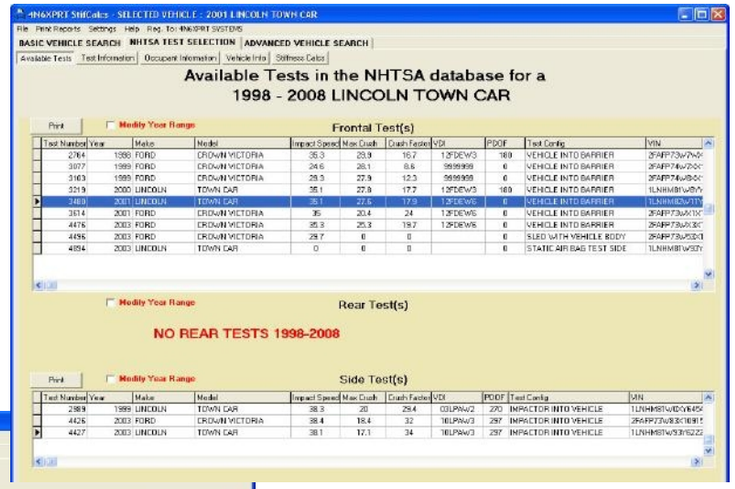
1-800-266-9778

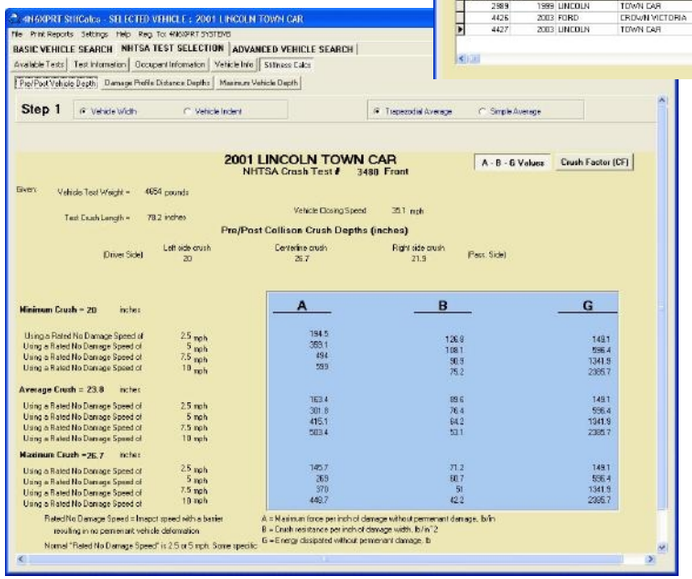
Select the desired vehicle through either our SISTER/CLONE READER or our ADVANCED SEARCH tab.



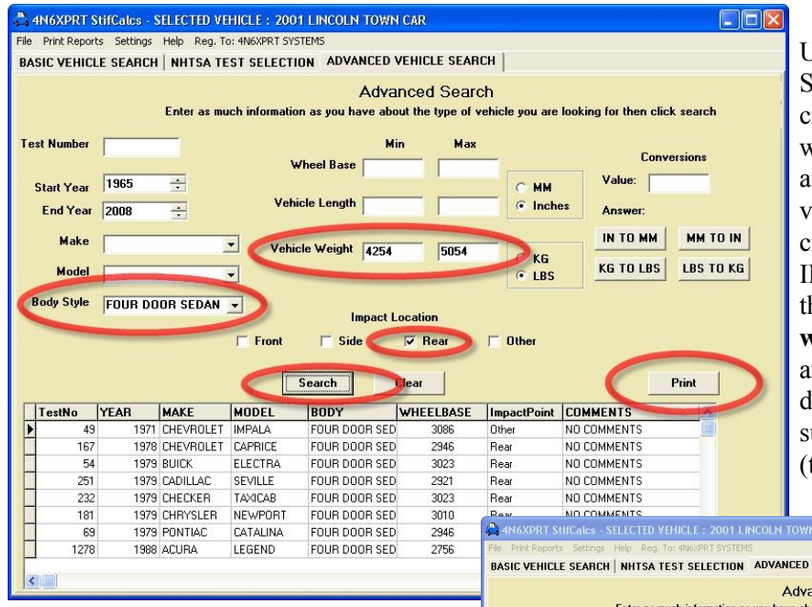


Once the desired vehicle is found/selected, click on the Test Selection tab. From here, select the test to be viewed

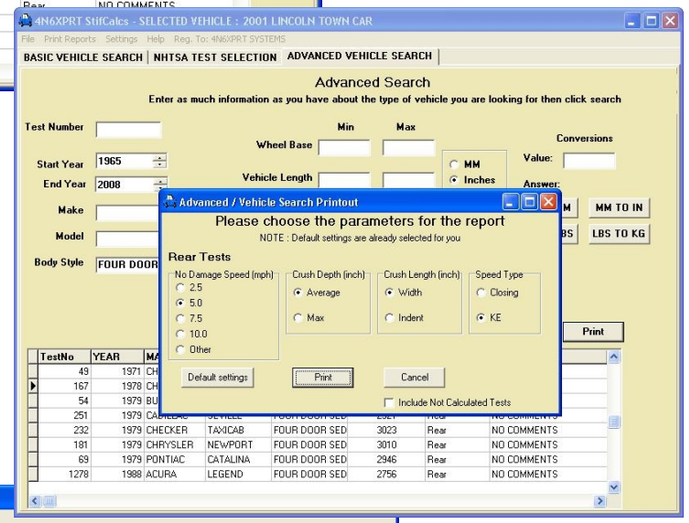




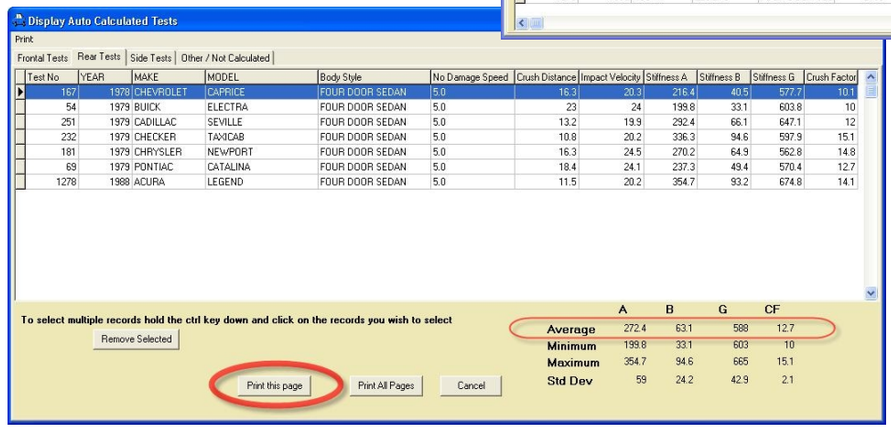
Once a test is selected, the available data for the Test, Occupant(s), Vehicle(s), and Stiffness data can be viewed. The stiffness values are automatically generated from the available test data.



Using the ADVANCED SEARCH tab, you can also create a CLASS of vehicle for when there are no tests available for the specific vehicle and test type. To create a class of REAR IMPACT stiffness values for the Lincoln, first set the **weight range**, **body style**, and **test type**, then **search** the database, when you have a sufficient number of tests (that is, more than one or two) that have been found, click the PRINT button:



Now Set your calculation parameters - **No Damage Speed - Crush Depth - Indentation (Crush) Length** - and **Speed**, then view your results, and if desired, print them to hard copy



The program will calculate the **AVERAGE, MINIMUM, MAXIMUM,** and **Standard Deviation** of the Stiffness Values calculated based upon the parameters you set in the preceding step.

4N6XPRT Systems

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

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

E-Mail: ***4n6@4n6xprt.com***

2012 ORDER FORM

Expert AutoStats® - Expert VIN DeCoder® - 4N6XPRT StifCalcs® - 4N6XPRT BioMeknx™
Expert Qwic Calcs® - Expert TireStuf® - 4N6XPRT Ped & Bike Calcs®

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

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

Expert AutoStats®:	$ 595.00 *	$_____
4N6XPRT BioMeknx™:	$ 495.00 *	$_____
4N6XPRT Ped & Bike Calcs®:	$ 375.00 *	$_____
Expert Qwic Calcs®:	$ 275.00 *	$_____
Expert TireStuf®:	$ 85.00 *	$_____
4N6XPRT StifCalcs®**:**	$ 600.00 *	$_____
Expert VIN DeCoder®:	$ 525.00 *	$_____
		======
	SUB-TOTAL	$_____

California shipping addresses add **8.50%** sales tax $_____
(*California orders delivered by e-mail attachment **DO NOT** owe sales tax*)

Handling **: *(Cash or Check with order = **$5.00**, Credit Card = **$10.00** , Govt. Purchase Order = **$15.00**)* $_____

Notarized Affidavit filing requirement - **$25.00 per required notarized signature**: $_____

Normal delivery will be via email of a download link to a self extracting zip file

☐ - Deliver via electronic download link (e-mail address required) $ 0.00

☐ - Please deliver on USB at an **additional cost of $35.00 per program** $_____

======

TOTAL $_____

Enclosed is:
Check____ Money Order____ Purchase Order____ Credit Card: Visa_____ Master Card_____ American Express_____

Card #_____ Expires_____ SecCode _____
Billing Add. :_____ Billing Zip: _____
Name on Card:_____ Signature: _____

PLEASE NOTE

-- Orders cannot be shipped without correct Shipping & Handling included.
-- California orders cannot be shipped without sales tax included.
-- Written Purchase Orders must be received in office before shipping.

* *Prices are subject to change without notice. Call for Multi-program and package purchase discounts.*
** *Orders will be shipped within 10 working days. Other shipping methods may cost extra. The Handling charge listed is for the first program,* ***add $5.00 per additional program*** *ordered at the same time and shipped to the same address.*

Please make checks, money orders or Purchase Orders Payable to: **4N6XPRT Systems®**

You may call or fax your order to us if paying by credit card.

4N6XPRT Systems

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

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): ____/____

←Visa/MasterCard American Express →

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,

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 ALL OPTIONS 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								

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

PAYMENT INFORMATION
Visa/MasterCard / American Express:

_____

Expires: _____ / _____

Name & Address:

_____

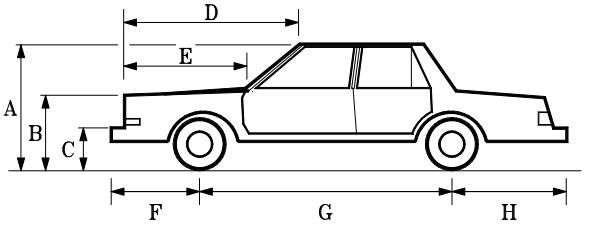
_____

_____

_____

Case Reference Name/Number:_____

Individual Vehicle Data Search Service®



Providing Vehicle dimensional data, VIN DeCoding, and NHTSA Crash Test Results as a service to the Litigation community.

E-Mail: **ivdss@4n6xprt.com**

FAX: (619) 464-2206
Phone: (619) 464-3478 / 1-800-266-9778

4N6XPRT Systems®
Forensic Expert Software
8387 University Avenue, Suite P
La Mesa, CA 91942-9342

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

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 (*when provided by VIN*)

Gross Vehicle Weight	Safety Equipment
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 **N**o **S**ignificant **D**imensional **C**hanges
VIN DeCoding when VIN is provided Information available

Mid-60's to present **also includes** (*when available*)

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*

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

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: _____

If you are requesting
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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:_____

4N6XPRT Systems

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

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): ____/____

←Visa/MasterCard American Express →

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,

Daniel W. Vomhof III
General Manager/Technical Support

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E-Mail: 4n6@4n6xprt.com

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:

- ❏ 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 **I**ndividual **V**ehicle **D**ata **S**earch **S**ervice, 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,

Daniel W. Vomhof III
General Manager/Technical Support

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Expert System Software for Litigation

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La Mesa, CA 91942-9342

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Fax: (619) 464-2206

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

E-Mail: 4n6@4n6xprt.com

FORCE BALANCE ORDER FORM

$40 for the first "Run" / $20 for each additional crush variation with same vehicles

Vehicle 1 (KNOWN Stiffness) - Year/Make/Model

_____

Curb Weight (pounds) = _____
Occupant + Cargo Weight (pounds) = _____
Total Weight (pounds) = _____

Angle of Collision Force to Force Normal to
Collision Face (degrees) = _____
PDOF Lever Arm Distance (inches) = _____

Damage Length (inches) = _____

If Crush Depth measurements are equally spaced, you do not need to fill in the distance between Crush measurements.

Crush Depth	**Crush Spacing EQUAL?? Yes / No**
C1 (inches) = _____	
	Distance C1 to C2 (inches) = _____
C2 (inches) = _____	
	Distance C2 to C3 (inches) = _____
C3 (inches) = _____	
	Distance C3 to C4 (inches) = _____
C4 (inches) = _____	
	Distance C4 to C5 (inches) = _____
C5 (inches) = _____	
	Distance C5 to C6 (inches) = _____
C6 (inches) = _____	
	Distance C6 to C7 (inches) = _____
C7 (inches) = _____	
	Distance C7 to C8 (inches) = _____
C8 (inches) = _____	
	Distance C8 to C9 (inches) = _____
C9 (inches) = _____	
	Distance C9 to C10 (inches) = _____
C10 (inches) = _____	

Vehicle 2 - Year/Make/Model

_____

Curb Weight (pounds) = _____
Occupant + Cargo Weight (pounds) = _____
Total Weight (pounds) = _____

Angle of Collision Force to Force Normal to
Collision Face (degrees) = _____
PDOF Lever Arm Distance (inches) = _____

Damage Length (inches) = _____

If Crush Depth measurements are equally spaced, you do not need to fill in the distance between Crush measurements.

Crush Depth	**Crush Spacing EQUAL?? Yes / No**
C1 (inches) = _____	
	Distance C1 to C2 (inches) = _____
C2 (inches) = _____	
	Distance C2 to C3 (inches) = _____
C3 (inches) = _____	
	Distance C3 to C4 (inches) = _____
C4 (inches) = _____	
	Distance C4 to C5 (inches) = _____
C5 (inches) = _____	
	Distance C5 to C6 (inches) = _____
C6 (inches) = _____	
	Distance C6 to C7 (inches) = _____
C7 (inches) = _____	
	Distance C7 to C8 (inches) = _____
C8 (inches) = _____	
	Distance C8 to C9 (inches) = _____
C9 (inches) = _____	
	Distance C9 to C10 (inches) = _____
C10 (inches) = _____	

Name_____
Company_____
Address_____
City/State/Zip_____
Phone_____
Case Reference _____

Visa/MasterCard/American Express
Card Number_____
Expiration _____/_____
Security Code_____
Card Billing Address_____
City/State/Zip_____

E-Mail_____

A Division of Expert Witness Services, Inc.

4N6XPRT Systems

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

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E-Mail: 4n6@4n6xprt.com

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Card Number: _____
Expiration Date (MM/YY): ____/____

←Visa/MasterCard American Express →

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**:

_____

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Daniel W. Vomhof III
General Manager/Technical Support